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# Acquirer's Operational Performance and Stability of Islamic Banks: Mediation Role of Market Structure

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## Abstract

Merger and acquisition known as a market expansion strategy. This paper examines several factors associated with M&A namely bank size, intermediary role, modes of financing, bank-specific variables, and macro-economic variables on the operational performance and stability along with the mediation role of market structure for Islamic banks. This paper employs panel data techniques and SEM to analyse a set of unbalanced panel samples of 10 Islamic banks during 2004Q1 to 2020Q4 from six countries, namely Qatar, Kuwait, Saudi Arabia, United Arab Emirate, Bahrain, and Pakistan. The results indicate that M&A improve post-M&A performance of Islamic banks while stability does not improve. Interestingly, there is no mediation effects of market structure on the relationship between M&A, operational performance, and stability. Policymakers should emphasis M&A towards the Islamic bank, however, to be stable, it may take more than 5 years.

**Keywords:** Merger and Acquisition (M&A); operational performance; bank stability; market structure; Islamic banks.

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## 1. Introduction

Merger and acquisition (hereafter, M&A) play an essential role in shaping the economy. Therefore, the importance of M&A cannot be denied. Being important, M&A has played a significant role in the economy for a long time. It has been used as a market expansion strategy in various sectors. The motive of having M&A is to generate better performance that would almost be impossible if pursued on a standalone basis. The financial sectors especially the banking sectors have used M&A as a market expansion strategy to generate better performance. A merger means the combination of two companies into one company. During the merging process one company survives and the other company loses their corporate existence. On the other hand, the acquisition means takeover. Although previous studies have conducted on several factors, the results were inconclusive and mixed.

Based on the previous studies, several factors namely bank size, intermediary roles, modes of financing, bank specific variables (liquidity, capitalization and credit risk) and macro-economic variables (GDP & inflation) are reviewed and analyzed. For example, 1 stated that the factors include characteristics of the banking sectors as well as the size and activity of the financial markets. Accordingly, 2 studied factors that impact the cross-border mergers and acquisitions (CBM&As) performance in Brazil, Russia, India, China, and South Africa (BRICS). Five factors were analyzed: lagged profit, asset growth, asset size, leverage, and payment method.

Previous studies discuss mediation affects in different disciplines except for M&A in banks. For example, market power leads to have more performance and stability (3; 4; and 5). If bank becomes efficient, it could lead to increase performances and consequently gain market power 6; 7. Market structure has a partial mediation effect on bank contract performance 3.

Interestingly, since the inception of M&As, the application of the mediation effects is yet to be studied. As far as the development and increase in the interest in M&As in the banking sectors, it is surprising that very little is known about this topic. Therefore, the purpose of the paper is towards that direction. A number of theories are reviewed and discussed. For example, resource dependency theory, efficiency theory, theory of financial intermediation, free cash flow hypothesis, shiftability theory, portfolio theory, trade off theory, and monetarism theory.

This paper applies panel data techniques, POLS, static model (e.g., fixed and random effects) and structural equation modelling (SEM) for a sample of an unbalanced panel data of 10 Islamic banks from 2004Q1 to 2020Q4 from the six countries namely, Saudi Arabia, United Arab Emirates, Qatar, Kuwait, Bahrain, and Pakistan. Panel techniques such as POLS and static model are used since data is in panel, however, they will take care of time invariant characteristics. Moreover, SEM is used to test the mediation effects of market structure. Whereas dynamic model (system GMM and dynamic

GMM) is not applied due to the constraints of groups (10 banks). Being small groups, number of instruments show high.

The findings imply that M&A generates a good result for the operational performance of Islamic banks while showing no difference for stability between pre and post M&As. Factors namely bank size (total assets, total deposits & operating income), intermediary role (financial intermediary role i.e., economies scale & economies of scope and non-financial intermediary role i.e., non-interest expenses to non-interest income), modes of financing, bank-specific variables (liquidity, credit risk & capitalization), and macro-economic variables (GDP & inflations). All the factors show significant impact on the operational performance and stability for Islamic banks. Interestingly, total assets, total deposits, capitalization, and GDP show mediation effects for Islamic banks. However, M&A towards the Islamic banks along with the mediating effects of market structure are the main contribution of our paper. Therefore, it can be concluded that present study has added value in terms of M&A towards Islamic banks, mediation effects of market structure to the existing literature.

The remainder of this paper is structured as follows. The next section presents literature and hypotheses of factors affecting M&A in banking sectors. Section 3 presents the research method while section 4 reports the estimation results as well as providing discussions. The final section presents conclusions of the paper.

## **2. Literature and Hypotheses Development**

Mergers and acquisitions (M&As) are an alternative way for organic expansion. The rationales for M&As are to better performances, expand operation in new markets, gain market power, products and services (economic and geographics expansions), generate and exploit economies of scale and scope, diversification of activities, integration of resources, and finally, reduce cost and minimization of risk. However, it is expected and hoped that M&As can improve performance and stability for Islamic banks. A number of factors are reviewed and discussed.

### **2.1 Bank Sizes**

9 emphasized that incentives are necessary to increase size through consolidation to lower the cost of funding and increase the value of shares. Accordingly other highlighted that the creation of mega Islamic banks through amalgamation could reveal the other Islamic banks and the “Giants” from the conventional side. Larger Islamic banks survive in competitive markets, boost industry growth, have huge potential to cross the border, and can be a global hub for the Islamic banking sector. Author suggests that two elements should be considered regarding the consolidation of Islamic financial institutions. Firstly, benefits arise out of economies of scope and scale, secondly, benefits from enhanced risk management or risk-sharing strategy through

diversification. These two factors are possibly the main driver for consolidation in the Islamic financial industry. A well-diversified bank has better-expected return-risk trade-offs resulting in lower variability of profits and higher security for depositors. Bank size is supported by resource dependency theory. Enterprises use their own ability to transfer resources and capabilities inside the merged firms and their competitive advantages (Lu, 2018). Smirnova (2014) posited that the merger enabled to integrate banking experiences, however firms absorb and integrate resources by dint of merges (Haleblian, Devers, McNamara, Carpenter, & Davison, 2009). Consequently, (i) *it is hypothesized that bank size is positively related to M&A, operational performance, and bank stability.*

## **2.2 Intermediary role of banks**

The main function of the banks is to be the intermediary between depositors and economic agents. Sufian (2011) mentions that the reason behind M&As deals is to achieve economies of scope rather than economies of scale. Mustafa et al. (2017) mentions that M&As may reduce earnings volatility as well as uncertainties through economies of scale and scope. Whereas Focarelli et al. (2002) states that acquisition is made to improve the quality of the portfolio of acquired banks. Acquiring banks can have both economies of scale i.e., by reducing manpower, shrinking the operation, and reducing the cash and securities. This may reduce and minimize the overall cost of the operation. Meanwhile large volume of financing economies of scope and support business expansions. Hence both, economies of scale and economies of scope significantly impact on bank performance and stability. The theory of financial intermediation supports the intermediary role (financial & non-financial). Whereas the theory said that financial intermediary defines by the fact that they mobilize funds from the money holders (savers), registering a debt (liability) towards them, and they issue their own assets towards fund users (Andrieş, 2009). Therefore, it presents the hypotheses (i) *financial intermediary role has positive relationship between M&A and operational performance and bank stability* and (ii) *non-financial intermediary role has positive relationship between M&A and operational performance and bank stability.*

## **2.3 Modes of financing**

Modes of financing are one of the important issues of M&A deals. M&A deal is either financed by cash or stock, a number of literature is reviewed and discussed. There are various modes of financing, i.e., cash, stock, or a combination of both, significantly impact performance 2. According to the findings of Healy, Palepu, & Ruback (1992), the post-M&A performance of acquirers is influenced by the modes of financing. Iankova (2014) stated that using cash, stock, or both of them depends on the value of the acquirer's stock. If the stock of the acquirer is overestimated in the market, then better to offer stock; otherwise, cash. André & L'Her (2004) investigated the relationship between post-M&As performance and modes of financing. Generally, M&As financed by stocks performed poorer in the long run. Some studies that examine

the type of payment argue that cash-financed transactions outperform stock-financed ones (Rau and Vermaelen, 1998; Andre et al., 2004; Megginson et al., 2004), while, other studies found no evidence that the method of payment influences the reported performance (Choi and Russell, 2004; Yook, 2004; Heron and Lie, 2002; King et al., 2004). The free cash flow hypothesis supports modes of financing. Chandra, & Atmaja (2014) mentioned that a bidder's free cash flow positively impacts the outcome. Similarly, Acquirer's gains are lower with high free cash flow (Dogru, Kizildag, Ozdemir, & Erdogan, 2020). Banks with negative free cash flow are more likely to be targets and therefore are taken over by acquirers of high free cash flow (Beccalli, & Frantz, 2010). Therefore, the paper offers a research hypothesis; *modes of financing (cash or stock) significantly impact operational performance and stability.*

#### **2.4 Bank specific variables**

Bank specific variables are categorized as the important factors impacting the performance and stability. M&A contributes to abnormal returns and negatively impacts profitability, efficiency, liquidity, leverage, size, and employee behavior on the banking industry (Banal-Estanol & Ottaviani, 2006, 2007). Malatesta (1983) stated that shareholders of acquiring firms experienced value reduction both at announcement time and over the following years of the mergers. Sufian et al. (2012) reported that banks revenue efficiency has not significantly improved during the post-merger period compared to the pre-merger period. Antoniadis et al. (2014) and Altunbaş & Marqués (2008) posited that differences between merging partners in their loan and credit risk strategies are conducive to higher performance. In contrast, diversity in their capital and cost structure has a negative impact on performance. Fayed (2013) suggests that conventional banks are better than Islamic banks in profitability, credit risk, liquidity, overall management, and solvency ratio. Boloupremo & Ogege (2019) showed that credit risk has minimal and is negatively associated with performance, while capitalization and liquidity are positively related to performance.

Shiftability theory, profitability theory and trade off theory support bank specific variables i.e., liquidity (LIDY), credit risk (CR), and capitalization (CAP). Shiftability theory states that banks should invest some of their funds available for investment in securities and credit instruments that have secondary market so that they can be converted to cash as and when a need arises to address declining liquidity (Sathyamoorthi, Mapharing, & Dzimiri, 2020). Profitability theory explains that profit is equal to marginal productivity of the manpower. While, trade-off Theory claims that firms have an incentive to use debt to benefit from debt tax-shields. So it can be stated that a firm has an incentive to turn to debt as the generation of annual profits allows benefiting from the debt tax shields. Therefore, the paper offers a research hypothesis; bank-specific variables (capitalization, liquidity & credit risk) have a significant impact on M&A and operational performance and bank stability.

#### **2.5 Macro-economic variables**

Bank cannot generate good performance without good economic conditions. Gross domestic product (GDP) and inflation have a significant impact especially on banking activities (Ibrahim & Rizvi, 2017; Salaber, Rao-Nicholson & Cao, 2016; Abbas et al., 2014; Kandil & Chowdhury, 2014; Gattoufi et al., 2014; Sufian & Habibullah, 2009; Al-Sharkas et al., 2008; Linder & Crane, 1993). Macro-economic variables like GDP and inflation are also used following Cortés et al. (2017) and Erel et al. (2017). Choi & Jeon (2011) confirmed previous literature results that found GDP as the most relevant factor in long-run relationships and determining the trend of aggregate mergers activity. Mohamed & Sidiropoulos (2010) meanwhile applied GDP as a proxy for economic size. Monetarism theory supports the macro-economic variables. While the theory said explained that the money supply (the total amount of money in an economy) is the chief determinant of current dollar GDP in the short run and the price level over longer periods. Moreover, the level of inflation depends on the money supply in the country and how it impacts on the institution's activities. Consequently, *macro-economic variables have significant impact between M&A and operational performance and bank stability*.

## **2.6 Mediation Effects of Market Structure**

Previous studies discuss on the mediation affects in different disciplines except for M&A of banks. For example, performance is the function of human action, while performance expectancy works as a mediator variable (Garland, 1985; Garland, & Adkinson, 1987). Firm leverage intervenes in the relationship between capital structure and firm performance (Ramli, 2014). Liquidity risk indirectly affects cost efficiency through the mediation role of profitability (Ganiyy, Ahmad, & Zainol, 2015). Based on concentration reports, stakeholders can take the strategic decision (Al-Muharrami & Matthews, 2009). Market power leads to having more performances and stability (3; 4; and 5). If bank becomes efficient, it leads to have more performance and consequently gain market power 6 & 7. Market structure has a partial mediation effect on bank performances through bank contracts 3.

A full mediation exists when the indirect effect path ( $a \times b$ ) is significant, whereas direct effect path  $c'$  is insignificant 8. Our paper focuses on the mediation role of market structure between M&A and banking sectors. The relative market power hypothesis is used to support market structure. As said by the RMP hypothesis, higher the market power through M&As, results in higher concentration and lower competitions as well as firms with well-differentiated products and higher profits. Therefore, the paper offers a research hypothesis; *market structure mediating the relationship between M&A and operational performance and bank stability*.

### **Summary of the research hypotheses**

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***Hypothesis 1- H1:*** Bank sizes have significant impact on the operational performance and stability of Islamic banks.

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**Hypothesis 2- H1:** Intermediary roles (i.e., financial and non-financial intermediary roles) significantly impact Islamic banks' operational performance and stability.

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**Hypothesis 3- H1:** Modes of financing (cash or stock) significantly impact on operational performance and stability of Islamic banks.

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**Hypothesis 4- H1:** Bank-specific variables (i.e., capitalization, liquidity & credit risk) significantly impact Islamic banks' operational performance and stability.

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**Hypothesis 5- H1:** Macroeconomic variables (i.e., gross domestic product & Inflation) significantly affect Islamic banks' operational performance and stability.

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**Hypothesis 6- H1:** Market structure mediates the relationship between factors of M&A and operational performance and stability of Islamic banks.

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In a nutshell, being relatively young and niche, there is no concern about too big to fail relatively too small to succeed for Islamic banks (Naseri, Bacha, & Masih, 2020), being small in size, it becomes diseconomies of scale and scope (Yudistira, 2003). Having better performance and sustainable financial growth, larger Islamic banks are needed (Fithria, & Sholihin, 2018; Ibrahim & Rizvi, 2017; and Barth et al., 2006). Therefore, M&As are warranted for Islamic banks (Yudistira, 2003).

Although mediating effects have been researched in previous studies except for M&As of banks. For example, bank efficiency mediates the relationship between bank size and bank profitability (Ruslan, Pahlevi., Alam, & Nohong, 2019). Inversely Shehu, Ibrahim, Mat, Nasiru, Popoola, Muhammad, & Kura (2013) stated that firm size does not fulfil the condition of mediating effects on the performance. Similarly, Akinyi (2019) found that financial leverage negatively mediates on the relationship between firm size and financial performance. Diantimala (2018) indicated that there is no indirect of firm size and liquidity on the firm values. Therefore, it is expected that there would be a cause effects relationship among M&As, market structure, performance and stability. Hence, the mediating effect of market structure on the event of M&As of bank is lacking.

Therefore, the objective of the paper is to analyses factors associated with M&A of acquirer operational performance and stability of Islamic banks along with the mediation role of market structure.

Dar (2004) stated that demand for Islamic banking services and products has increased in the UK regarding loan and mortgage or house financing, income, occupation, and education. Kahf (1999) stated that merger and expansion are compulsory for the survival of Islamic banks in an era of high competition Shari'ah-based products and services have drawn mass attention from both Muslims and non-Muslims. Kaakeh, Hassan & Van Hemmen Amazon (2018) observed that norms, religious motivation, and awareness are important factors affecting the intention to use Islamic banking products



and services. In terms of awareness, some findings showed that highly educated people are reluctant to use Islamic banking products and services, however, Dar (2004) found that educated people have shown positive reactions to Islamic banking products and services. The demand for Islamic banking services is due to both religious beliefs and economic factors. Religious belief does not limit preferences to only Muslim ( $\frac{3}{4}$  Muslim in UK are indifferent about having Islamic banking services). Rather non-Muslim also have preferences to have services of Islamic banks like in Malaysia as a significant number of both Chinese and Indians are using Islamic banking products and services.

The Deputy Governor of Bahrain suggested that Islamic banks are expected to achieve both economies of scale and scope through M&As activities would be implemented. Jatkar (2012) argued that M&As resulting in larger banks should not affect agility. The aim should be to create a nimble giant rather than a clumsy dinosaur.

Sufian & Habibullah (2009) mentioned that the central bank of Malaysia has always encouraged domestic banking institutions to merge. An efficient bank is assumed to be well organized and has more capable management. Since less efficient banks have room for improvement a takeover by more efficient banks can bring better management quality into the inefficient banks. This will, in turn, lead to a more efficient and better performing merged unit.

Diseconomies of scale are another catalyst to promote M&As in the Islamic banking sector. Islamic banks suffer from diseconomies of scale due to smaller assets size lower. Piloff & Santomero (1998) pointed out that when the bank becomes larger, they reach the level of scale economy and offer more products and services to the market. Furthermore, it is worthwhile to study M&As in the Islamic banking sector since the percentage of M&As in the Muslim majority, countries have increased significantly compared to non-Muslim countries (Table 2.1).

**Table Error! No text of specified style in document..1: M&As Activity in Islamic and Non-Islamic Countries**

| <b>Panel A. M&amp;A deals in Islamic and non-Islamic countries</b> |                                |                    |                  |                    |  |                    |                    |                   |
|--|--------------------------------|--------------------|------------------|--------------------|--|--------------------|--------------------|-------------------|
|  | <b>Islam is 1<sup>st</sup></b> |                    |                  |                    | <b>Islam is 1<sup>st</sup> or 2<sup>nd</sup></b> |                    |                    |                   |
|  | <b>All</b>                     |                    | <b>CBO</b>       |                    | <b>All</b>                                       |                    | <b>CBO</b>         |                   |
|  | Islamic                        | Non-Islamic        | Islamic          | Non-Islamic        | Islamic  | Non-Islamic        | Islamic            | Non-Islamic       |
| <b>Total M&amp;A deals</b>   | <b>40,658(6)</b>               | <b>612,179(94)</b> | <b>17,366(9)</b> | <b>174,333(91)</b> | <b>41,2047(63)</b>                               | <b>240,790(37)</b> | <b>144,151(75)</b> | <b>47,548(25)</b> |
| 1980-1991  | 823(2)                         | 32,367(98)         | 412(3)           | 12,250(97)         | 27,808(84)                                       | 5,382(16)          | 11,092(88)         | 1,570(12)         |
| 1992-2003  | 13,448(6)                      | 209,843(94)        | 5,278(8)         | 64,999(92)         | 154,583(69)                                      | 68,708(31)         | 54,537(78)         | 15,740(22)        |
| 2004-2015  | 26,387(7)                      | 369,969(93)        | 11,676(11)       | 97,084(89)         | 229,656(58)                                      | 166,700(42)        | 78,522(72)         | 30,238(28)        |

| <b>Panel B. Total values of M&amp;A deals</b> |              |               |              |              |              |              |              |              |  |
|---|--------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--|
|   | <b>All</b>   |               | <b>CBO</b>   |              | <b>All</b>   |              | <b>CBO</b>   |              |  |
|   | Islamic      | Non-Islamic   | Islamic      | Non-Islamic  | Islamic      | Non-Islamic  | Islamic      | Non-Islamic  |  |
| <b>Total deals value (USD bill)</b>           | <b>896.9</b> | <b>13,642</b> | <b>439.5</b> | <b>3,931</b> | <b>8,588</b> | <b>5,951</b> | <b>3,305</b> | <b>1,065</b> |  |
| 1980-1991                                     | 21.3         | 799.3         | 7.6          | 246.9        | 658.7        | 161.8        | 219.5        | 35.1         |  |
| 1992-2003                                     | 249.5        | 4,118         | 89.7         | 1,206        | 2,990        | 1,377        | 1,048        | 247.1        |  |
| 2004-2015                                     | 626.1        | 8,725         | 342.1        | 2,478        | 4,939        | 4,412        | 2,037        | 783.2        |  |

Sources: Adopted from Elnahas, Hassan & Ismail (2017, p. 227).

Notes: This table describes M&A activity in Islamic majority countries. Two approaches to define Islamic country. Islam is 1st is a more restrictive definition at which a country is defined as Islamic only if more than 50% of its population are adherent to Islam. Islam is 1st or 2nd is a less restrictive definition at which a country is defined as Islamic if Islam is either its first or second religion. All is all M&A activity (domestic as well as cross-border). CBO is a cross-border deal only.

Elnahas, Hassan & Ismail (2017) studied M&As are intuitive enough to study M&As in the Islamic banking sector. They found that the growth of M&As in Muslim countries has increased with the opposite happening in non-Muslim countries. Table 2.2 shows the details.

**Table Error! No text of specified style in document..2: Growth of M&As in Muslim and Non-Muslim Country from 1980 to 2015**

| Year      | Total no. of deal | Number of M&As deal |                     |                     |        | Total M&As deal value (USD bil) |                 |        |                     |        |
|-----------|-------------------|---------------------|---------------------|---------------------|--------|---------------------------------|-----------------|--------|---------------------|--------|
|           |                   | Islamic country     | Growth <sup>6</sup> | Non-Islamic country | Growth | Total Value                     | Islamic country | Growth | Non-Islamic country | Growth |
|           | <b>652837</b>     | <b>40658</b>        |                     | <b>612179</b>       |        | <b>145339</b>                   | <b>896.9</b>    |        | <b>13642</b>        |        |
| 1980-2015 |                   | <b>(6%)</b>         | -                   | <b>(94%)</b>        | -      |                                 | <b>(0.62%)</b>  | -      | <b>(9.38%)</b>      | -      |
| 1980-1991 |                   | 823                 | -                   | 32367               | -      |                                 | 21.3            | -      | 799.3               | -      |
|           |                   | (2%)                |                     | (5.3%)              |        |                                 | (2.4%)          |        | (9.86%)             |        |
| 1992-2003 |                   | 13448               | 15.34               | 209843              | 5.48   |                                 | 249.5           | 10.71  | 4118                | 4.15   |
|           |                   | (33%)               |                     | (34%)               |        |                                 | (28%)           |        | (30%)               |        |
| 2004-2015 |                   | 26387               | 0.96                | 369969              | 0.76   |                                 | 626.1           | 1.51   | 8725                | 1.12   |
|           |                   | (65%)               |                     | (60%)               |        |                                 | (70%)           |        | (64%)               |        |

Source: Author's calculation following Table 2.6

<sup>6</sup> Growth has calculated (value of current year – value of previous year / value of previous year) \*100

Table 2.2 shows the calculation of the growth of M&As in Muslim and non-Muslim countries. The calculations are under two headings which are the number of the deals and the total value of the deals. The total number of deals was 652837, 40658 (6%) deals were in Muslim countries and the remaining 94% in non-Muslim countries from 1980 to 2015. The rate of M&As growth in Muslim countries was higher than that of non-Muslim countries, although the percentage of M&As in the non-Muslim countries exceeded the percentage of M&As in Muslim countries. 1992-2003 and 2004-2015. Hence it is worthwhile to study M&As in the Islamic banking sector. Table 2.3 shows a summary of studies on M&As in the Islamic banking sector.

**Table Error! No text of specified style in document..3:** Summary of conceptual studies on M&As in the Islamic banks

| <i>Author (s)</i>                        | <i>Sample of the study</i>   | <i>Variables</i>  | <i>Methodology</i>                 | <i>Findings</i>  |
|--|--|---|------------------------------------|--|
| Ibrahim, M. H., & Rizvi, S. A. R. (2017) | Bangladesh, Egypt, Indonesia, Jordan, Malaysia, Pakistan, Tunisia, Turkey along with GCC countries, Banks, 1993 to 2004. | Z-score (a measure of stability), bank size (total bank asset), regulations, Control variable lending activity, bank profitability, bank liquidity, economic growth, and inflation. | GMM, cross country (dynamic panel) | Larger Islamic banks are more stable, at least when they surpass a certain threshold size.<br><br>Benefits of having bigger Islamic banks or mega Islamic banks. Improving regulations.  |
| Kandil, T., & Chowdhury, D. (2014)       | UK, Islamic Banks, 1999 to 2009  | ROA, ROI, bank size (bank's revenue), Financial leverage.   | Regression model                   | differences in the performances of the Islamic banking sector between pre-post M&As.   |
| Iqbal, Z. (2008)                         | General, Islamic Financial Institutions (IFIs)   | General discussion.   | NA                                 | IFIs must expand the scope of their products and services to meet the challenges of domestic and international markets.<br><br>Due to the small size of the economy, larger banks are unable to use resources and minimize the cost efficiently. |

### 3. Research Method

#### 3.1 Sample data

This paper employs an unbalanced panel data of 10 Islamic banks (see Appendix Table A1.3) from 6 countries<sup>7</sup>, 2004Q1 to 2020Q4. Those banks are selected based on the Bloomberg database for the stated period. Based on that, six countries are selected as well. Data is collected from several secondary sources namely Bloomberg, FitchConnect database, Banks' financial statements, IMF, and World Bank database. Data is divided into two categories namely pre-M&A deal (i.e., 5 years before M&A), and post-M&A deal (e.g., 5 years after M&A).

Accounting-based indicators are used to measure M&A performance in the banking sectors. Since all variables are from accounting-based data while management has a significant influence on performance. Hence accounting-based indicators are used for the paper. The endogenous variables such as return on asset (ROA) and return on equity (ROE) are used as a proxy for operational performance and Z-score is used to measure bank stability. Several explanatory focus variables are used such as bank size (i.e., total assets, total deposits, operating income), the financial intermediary role is measured by the cost to income (economies of scale) & loan to deposit (economies of scope) and the non-financial intermediary role is measured by non-income to non-interest expenses. The Herfindahl–Hirschman Index (HHI) is used to represent market structure. Other control variables namely bank specific variables; credit risk (CR), liquidity (LIDY), capitalization (CAP) and macroeconomic variables; gross domestic products (GDP) & inflation (INF) are used. Following table shows the list of variables.

**Table; variables explanation**

| <b>Variables</b>                                    | <b>Definition</b>   |
|---|---|
| <b>Dependent:</b><br>Operational performance<br>ROA | ROA and ROE measure the operational performance of the banking sector. ROA; how the manager is efficient to have better ROA by using bank assets. |

<sup>7</sup> Saudi Arabia, Qatar, Bahrain, Kuwait, UAE, and Pakistan. Those countries are selected because of the M&A deal of Islamic banks occurred within those periods i.e., from 2004 to 2020.

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|                          |  |
|--------------------------|--|
| ROE                      | While ROE implies profit generated with the money shareholder have invested. |
| Bank stability (Z-score) |  |

Bank Stability

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**Independent:**

Bank size

|      |                                   |
|------|-----------------------------------|
| BSTA | Bank size log of total assets     |
| BSTD | Bank size log of total deposits   |
| BSOI | Bank size log of operating income |

Financial & non-financial intermediary

|        |   |
|--------|---|
| roles  | Loan to deposits; To measure the effect of lending activities of the bank, the loan ratio is used; loan to the total assets; lower ratio indicates excessive liquidity. |
| Escope |   |
| Escal  | Cost to income; The efficiency ratio implies how efficient the bank is. A lower or negative value indicates the better of the bank.                                     |
| NFIR   | Non-interest cost to non-interest income, to measure non-financial intermediary role. Lower is better.  |

Modes of financing

|     |                                   |
|-----|-----------------------------------|
| FIN | M&A is financing by stock or cash |
|-----|-----------------------------------|

Bank specific

|                 |  |
|-----------------|--|
| LIDY            | Liquid assets/total deposits; to know liquidity position of the banks  |
| CR              | Loan loss reserve to the gross loan is used to measure the credit risk of the bank.  |
| CAP             | Total equity to total assets; represents the financial condition of the banks especially the shareholder's portion.  |
| Macro economics |  |
| GDP             | To measure M&As performances along with bank-specific factors, macro factors were also used. Gross domestic product is used to represent the economic size of the particular country |
| INF             | Inflation has been measured by the Consumer Price Index (CPI)  |

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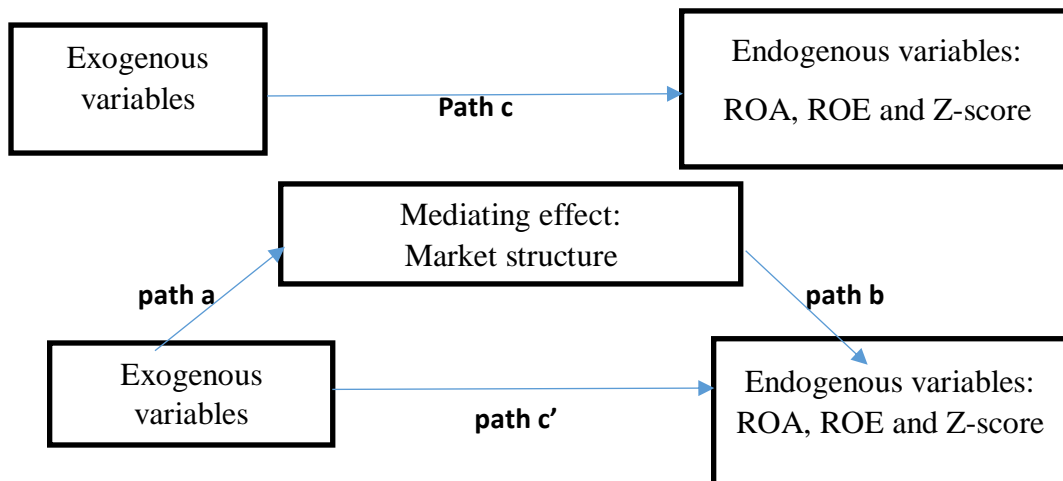
### 3.2 Data analysis

Panel data techniques and structural equation modelling (SEM) are used in this paper. Panel data techniques, namely POLS, the static model [i.e., fixed effect (FE) and random effect (RE)] along with the baseline model, and structural equation modelling (SEM). FE is also known as within estimator or least square dummy variable estimator or covariance estimator. Fixed effects (FE) regression is used to control for omitted variables that differ between cases but are constant over time. This is the benefit of FE used to observe the effect of omitted independent variables on the dependent variable.

Meanwhile, the random effect (RE) model is the estimator used to estimate omitted variables that are constant over time, differ across cases and others may be fixed between cases and vary over time. The less restrictive estimator is used to select between POLS and Fixed effects, Lim test for choosing between POLS and random effects, while Hausman test is used to select between fixed effect and random effect. Stata package 14.2 is used to analyze Panel data techniques and SEM (Acock, 2013; Venturini, & Mehmetoglu, 2019; Huber, 2014). The paper applies Structural Equation Modeling (SEM). Stata 14.2 package software is used for the estimation (Venturini, & Mehmetoglu, 2019).

Figure 1 implies the structural flow of the SEM while Table 3 states the typology of the mediation effects. Typology of the mediation affects three types of mediation effects: partial mediation, full mediation, and no mediation effects. Partial mediation consists of complementary and competitive mediation effects, full mediation means indirect mediation only while no mediation effects meaning that there is only direct relationship between exogenous and endogenous variables are exist. 8 noted that the current mediation literature discusses two different types of mediation, full and partial mediation.

Hair, Ringle, & Sarstedt, (2013) and Preacher, & Hayes, (2008) prove many rules representing types of mediation relationships. The following steps are given.



**Figure 1: Flow of Structural Equation Modeling (SEM)**

**Step 1:** Regress the endogenous variables by the exogenous variables (path c) ensuring that exogenous variables predict endogenous variables.

$$Y = \alpha + \beta_1 X_n + \epsilon, \text{ while } \beta_1 \text{ is significant} \dots \dots \dots (\text{Eq 1})$$

Where,  
Y = endogenous variables,  
 $\alpha$  = constant term,  
 $\beta_1$  = coefficient of exogenous variables,  
 $X_n$  = exogenous variables, and  
 $\epsilon$  = error term

**Step 2:** Regress the mediator variable by the exogenous variables to confirm that the exogenous variables are the significant predictor for the mediator.

$$M = \alpha + \beta_1 X_n + \epsilon, \text{ while } \beta_1 \text{ is significant} \dots \dots \dots (\text{Eq 2})$$

Where,  
M = mediator variable,  
 $\alpha$  = constant term,  
 $\beta_1$  = coefficient of exogenous variables,  
 $X_n$  = exogenous variables, and  
 $\epsilon$  = error term

**Step 3:** Regress the endogenous variables by the mediator and exogenous variables to confirm that the mediator has a significant predictor of the endogenous variables and the previously significant coefficient of exogenous variables in step #1 is slightly reduced. Moreover, by entering a mediator variable into a model, the exogenous variables may no longer affect the endogenous variables (e.g., complete mediation i.e., indirect only mediation) or get a weak (e.g., partial mediation i.e., complementary and competitive mediation), and a causal mediating model exists (Namazi, & Namazi, 2016).

$$Y = \alpha + \beta_1 X_n + \beta_2 M + \epsilon, \text{ while } \beta_2 \text{ is significant} \dots \dots \dots (\text{Eq 3})$$

Where,  
Y = dependent variable  
M = mediator variable,  
 $\alpha$  = constant term,  
 $\beta_1$  = coefficient of exogenous variables,  
 $X_n$  = exogenous variables, and  
 $\epsilon$  = error term

$\beta_1$  should be smaller in absolute value than the original mediation effect. Table 1 shows the typology of mediating effect.

**Table 1 Typologies of Mediation Effect**

| NO | Types of Mediation       | Mediation Effects | Description  |
|----|--------------------------|-------------------|--|
| 1  | Complementary Mediation  | Partial Mediation | The indirect effect (path a x b) and direct effect (path c) both significant and the signs pointing the same direction     |
| 2  | Competitive Mediation    |                   | The indirect effect (path a x b) and direct effect (path c) both significant and the signs pointing the opposite direction |
| 3  | Indirect Only Mediation  | Full Mediation    | The indirect effect (path a x b) is significant, but the direct effect (path c) is not significant                         |
| 4  | Direct Only No-Mediation | No mediation      | The indirect effect (path a x b) is not significant, but the direct effect (path c) is significant                         |
| 5  | No Effect; Non-Mediation |                   | Neither the indirect or direct effect is significant   |

Source: (Ramli, 2014; Zhao et al., 2010; Rucker et al., 2011; Hair et al., 2013)

### 3.1.2 Model specification

The following models are designed for the analysis of M&A.

$$Y_{nt} = \alpha_{nt} + \beta X_{nt} + \epsilon_{nt} \dots\dots\dots (Eq 1)$$

#### Return on asset (ROA)

$$ROA_{nt} = \alpha_{nt} + \beta_1 BSTA_{nt} + \beta_2 BSTD_{nt} + \beta_3 BSOI_{nt} + \beta_4 Escal_{nt} + \beta_5 Escop_{nt} + \beta_6 NFIR_{nt} + \beta_7 LIDY_{nt} + \beta_8 CAP_{nt} + \beta_9 CR_{nt} + \beta_{10} GDP_{nt} + \beta_{11} INF_{nt} + \epsilon_{nt} \dots\dots\dots (Eq 2)$$

#### Return on equity (ROE)

$$ROE_{nt} = \alpha_{nt} + \beta_1 BSTA_{nt} + \beta_2 BSTD_{nt} + \beta_3 BSOI_{nt} + \beta_4 Escal_{nt} + \beta_5 Escop_{nt} + \beta_6 NFIR_{nt} + \beta_7 LIDY_{nt} + \beta_8 CAP_{nt} + \beta_9 CR_{nt} + \beta_{10} GDP_{nt} + \beta_{11} INF_{nt} + \epsilon_{nt} \dots\dots\dots (Eq 3)$$

#### Bank stability (Z-score)

$$Z\text{-score}_{nt} = \alpha_{nt} + \beta_1 BSTA_{nt} + \beta_2 BSTD_{nt} + \beta_3 BSOI_{nt} + \beta_4 Escal_{nt} + \beta_5 Escop_{nt} + \beta_6 NFIR_{nt} + \beta_7 LIDY_{nt} + \beta_8 CAP_{nt} + \beta_9 CR_{nt} + \beta_{10} GDP_{nt} + \beta_{11} INF_{nt} + \epsilon_{nt} \dots\dots\dots (Eq 4)$$

Where,

$\alpha$ ; constant term,  
 $\beta$ ; coefficient for other variables,  
ROA; return on asset,  
ROE; return on equity,  
Z-score; bank stability,  
BSTA; bank size – total assets,  
BSOI; bank size-operating income,  
BSTD; bank size-total deposits,  
Escale; cost to income ratio,  
Escope; loan to total deposits,  
NFIR; non-interest cost to non-interest income,  
LIDY; liquid asset to total assets,  
CAP; equity to total assets,  
CR; loan loss reserve to gross loan,  
GDP; gross domestic products,  
INF; inflation,  
 $\mathcal{E}$ ; error term

### **3.4 Diagnostic test**

Multicollinearity, heteroscedasticity, and auto-correlation are tested for the data set's accuracy and avoid any bias in the estimations. Multicollinearity occurs when independent variables in a regression model are correlated. This correlation is a problem because independent variables should be independent. If the degree of correlation between variables is high enough, it can cause problems. Heteroscedasticity implies a linear regression model and assumes that the error terms are normally distributed. It tests whether the variance of the errors from regression is dependent on the values of the independent variables.

Autocorrelation is a characteristic of data that shows the degree of similarity between the values of the same variables over successive time intervals. In conclusion, based on the diagnostics tests, it is shown that there is a problem of heteroskedasticity and autocorrelation while no multicollinearity problem exists. Therefore, the Whites (1980) heteroskedastic-consistence covariance matrix estimation is used throughout the regressions to solve the problems. Table 1 summarizes the diagnostics test results.

### **Table 2: Diagnostics tests**

| <b>Test</b>        | <b>Test value</b>                           | <b>Decision role</b>   |
|--------------------|---|--|
| Multicollinearity  | Vif = 8.10                                  | Since the value is less than 10, it shows no multicollinearity problem                     |
| Heteroskedasticity | chi2 (19) = 6800.10,<br>Prob>chi2 = 0.0000. | Since the p-value is less than 5% Ho hypothesis i.e., Heteroskedasticity problem exists    |
| Auto-correlation   | F(1, 17) = 10.473,<br>Prob > F = 0.0049     | Since the p-value is less than 5%, Ho hypothesis i.e., the auto-correlation problem exists |

## 2. Results and Discussions

The descriptive statistics of the unbalanced panel data set for relevant variables are presented in Table A1.1. It shows preliminary features of the data. The results are divided into three parts, pre & post-M&A, pre-M&A, and post-M&A. The results show that operational performance increases while bank stability does not differ between pre and post M&As. Table A1.2 presents the correlation matrix. It shows that there is no problem of multicollinearity among the variables. Several tests are used to select between POLS, FE, and RE. For example, the Chow test is used to select between POLS and FE, the Lim test is used to choose between POLS and RE, and the Hausman test is used to select between FE and RE. Based on the Hausman tests, the fixed effects model is shown appropriate model and discussed accordingly.

### 4.1 Multivariate Results of M&A on Operational Performance (ROA)

Table 3 reports the operational performance of pre and post M&As for Islamic banks. R-squared (within) of the operational performance (ROA) of pre-M&As is 0.143. Meaning that the variance of the operational performance (ROA) of the Islamic banks is explained by the explanatory variables. Generally, a higher R-squared implies a better fit for the model. The paper reports the findings of ROA since the results are similar wit ROE. Return on assets (ROA) equal net income divided by total assets. It shows the profit earned per unit of assets and reflects the management's ability to utilize the banks financial and real resources to generate profits. For this reason, it may be considered as the best measure of efficiency. ROA is preferred to other profit measures because it measures the efficiency of banks with respect to banking operations (Chowdhury, & Rasid, 2016; Ben Naceur and Goaid, 2008; Kosmidou, 2008; Hassan & Bashir, 2003).

***In the pre-M&As scenario***, bank size (total assets) negatively impacts the operational performance of the Islamic banks by 0.538 units that is statistically significant at 1% level. Meaning that for every 1 unit increases in the total assets of the Islamic banks would reduce operational performance

by 0.538 units. This finding is in line with the resource dependency theory, which said that resources significantly impact the organization's outcome. Firm size is an essential determinant of profitability (Dickerson et al., 1997).

Since the study is in M&As of banks, this study considers the intermediary role which is one of the important factors impacting the M&As outcome. The results show that bank's intermediary roles (financial and non-financial) play a significant impact on the M&As of the Islamic banks. More specially, looking at the coefficient and p-value so far, the findings imply that the intermediary roles significantly impact the operational performance of the banks. Financial intermediary roles are proxied by the economics of scale measured by the cost to income and economies of scope measured by loan to deposit. In contrast, the non-financial intermediary role is proxied by non-interest expenses to non-interest income.

The coefficient of the economies of scale is negatively associated with the operational performance of the Islamic banks. Meaning that for every 1-unit increase (decrease) in the cost to income ratio that would reduce (increase) operational performance of the Islamic banks that is statistically significant at 1% level. Likely, economies of scope show negative impact but weak for every 1 unit increase to the economies of scope that tend to reduce the operational performance of the Islamic banks by 0.012 units which are statistically significant at 10%. The finding is opposite of the findings of Ibrahim & Rizvi (2018) who said that economies of scope (deposit growth and financing growth) are positively associated with the bank's performance. The main functions of banks are taking deposits and giving loans; hence, interest spread is the main source of earnings.

The non-financial intermediary role is positively associated with the operational performance of Islamic banks. Looking at the findings, for every 1-unit increase (decrease) to the non-interest expense to non-interest income ratio, that would tend to increase (decrease) operational performance of Islamic banks by 0.023 units that is significant at 1%. Based on the findings it shows that the non-financial activities of the bank more influence the performance of Islamic banks. This study's findings are in line with the efficiency theory and financial intermediary theory. Efficiency theory states that the main reason for M&As is to generate better performance, while the theory of financial intermediation implies that bank performance depends on the intermediary activities of banks.

Modes of financing is left undiscussed since there is no concern about modes of financing in pre-M&As. At the same time, the variable is estimated and discussed at the post M&As scenario. Besides focus the variables, this study uses control variables as well. This includes bank-specific variables the likes of credit risk, capitalization, and liquidity and macro-economic variables, namely gross domestic products (GDP) and inflation. The results are reviewed and discussed accordingly.

Closer inspection of the results (see Table 3) shows credit risk and capitalization significant impact on the M&As outcomes for Islamic banks. Looking at the coefficient and p values so far, the pre-mergers and acquisitions era with regards to ROA, liquidity is not statistically significant in explaining the changes in ROA and left undiscussed. Credit risk shows negative, and capitalization shows positive impact on the operational performance of Islamic banks. As findings indicate, for every 1 unit increases to the credit risk that would reduce the operational performance of the Islamic banks by 0.065 units that is statistically significant at 1%.

Capitalization shows positive impact on the performance of M&A of Islamic banks. For every 1 unit increases to the capitalization that would increase the operational performance of Islamic banks by 0.067 units that is statistically significant at 1%. The findings are consistent with Diaconu & Oanea (2015), who stated that banks' internal determinant significantly impacts their performance.

Finally, according to the findings so far, macro-economic variables also significantly impact the operational performance of Islamic banks. However, the coefficient of the GDP is positive for the Islamic banks that is statistically significant in explaining the changes in ROA and left undiscussed. Since the coefficient is positive, it has a probability to impact on the M&As of banks positively. Another macro-economic variable, namely inflation, indicates a negative impact on Islamic banks' operational performance, which means that for every 1 unit increase to the level of inflation, that would reduce operational of Islamic banks by 0.236 units, which is significant at 10%. It is saying that a higher level of inflation that would deteriorate the performance of the banks. The finding is consistent with Amene & Alemu (2019) who opined that inflation negatively impacts on operational performance.

***In the post-M&As scenario***, the R-squared (within) of the operational performance (ROA) for Islamic banks is 0.367, which means ROA variance that is explained by the explanatory variables. Generally, a higher R-squared implies a better fit for the model.

Likely pre-M&As, bank size (total assets) shows a significant impact on the M&As of Islamic banks. More specially, bank size positively impacts the operational performance, which means that 1 unit increases to the total assets that would increase the operational performance of Islamic banks by 0.765 which is statistically significant at 1% level. The finding is supported by Dickerson et al. (1997) who said that the acquirer's size can influence post-acquisition performance. Furthermore, Ibrahim & Rizvi (2017) and Barth et al. (2006) opined that bigger Islamic banks are needed to increase performance, enhancing financial stability. Therefore, based on the findings, it is concluded that the results are in line with the resource dependency theory since the theory implies that resources have a significant impact on the outcome of the organization.

Like pre-M&As, intermediary roles (financial and non-financial) significantly impact the operational performance of post-M&As. The intermediary financial role, namely economies of scale, positively impacts the operational performance of Islamic banks. They are pointing to this, for every 1-unit increase (decreases) in economies scale that would tend to increase (decrease) operational performance of Islamic banks by 0.035 units at 1% significant level. The results are consistent with Vernanda & Widyarti (2016) who mentioned that economies of scale lower costs through expansion of operational activities. Similarly, economies of scope indicate positive impact for operational performance. Vernanda & Widyarti (2016) also find the same results saying that economies scope positively impacts the performance of the banks.

Intuitively it says that in post-M&As, Islamic banks have better position in terms of expanding their operation through financing since economies of scope (loan to deposit) show positive coefficient. The finding implies that for every 1 unit increase to the economies of scope that tend to increase the operational performance of Islamic banks by 0.006 units at 5% significant level. Hence, banks should consider expansion strategy so that they can integrate potential resources, reduce duplicate operations, reduce probable operational and non-operational cost, and boost their performance. Non-financial intermediary role plays negative role in the operational performance. 1-unit increases (decreases) to the non-financial intermediary role tend to reduce (increase) performance by 0.316 units at 10%. Mat-Nor, & Mohd-Said (2010) showed that bank's focused on more intermediary activities to scale up their operation and minimize the cost after M&As. The results are in line with the theory of financial intermediation. Whereas the theory of financial intermediation implies, the bank works as an intermediary in facilitating deposits and financing. At the same time, its intermediary roles (i.e., financial and non-financial) affect the organization's performance.

Modes of financing is also used as the factors. The variables are omitted since the study select fixed affect model. In the fixed-effects model, dummy variable is omitted since categorical variables do not vary with time and then Stata omits dummy for fixed effects. But in the POLS model, the results show that modes of financing is positive and statistically significant at 10% and 1% level. The results conclude that cash financing impacts operational performance compared to stock financing. The results are consistent with (Dickerson et al., 1997) and Bertrand and Betschinger (2012) who mentioned that the financing method positively impacts performance. 2 said that in post-M&As, acquirers' performance is also influenced by modes of financing. While the finding is opposite of Sullivan et al. (1994) who found that returns to acquirers are not affected by the method of financing M&As deals. Accordingly, Dogru, Kizildag, Ozdemir, & Erdogan (2020) said that the acquirer's performance is lower due to the higher free cash flow. Furthermore, the finding is opposite of the free cash flow hypothesis which mentioned that M&As performance lower due to the conflict between managers and shareholders in choosing M&As strategy. Lang, Stulz, & Walkling (1991) observed that the free cash flow hypothesis posits that cash flow increases the agency costs of firms with poor investment opportunities.



As shown in Table 3, the finding implies that control variables also impact on operational performance. Looking at, credit risk and capitalization have significant impact on the post M&As outcomes. At the same time, liquidity does not show statistically significant in explaining ROA changes and is left undiscussed. Credit risk shows negative while capitalization shows positive impact on the operational performance. As findings indicate, for every 1 unit increases to the credit risk that would reduce the operational performance of the Islamic banks by 0.210 units that is statistically significant at 5%. The findings are in line with Boloupremo & Ogege (2019) who showed that credit risk had a minimal and negative impact on performance while capitalization and liquidity are positively related to the performance. Since financing of the Islamic banks is gone through Shariah screening and hence, they are also more sensitive to risk. Capitalization shows a positive impact on the performance of M&A. 1 unit increases to the capitalization that would increase the operational performance by 0.133 units is statistically significant at 10% and 5%, respectively.

Finally, as the findings imply, macro-economic condition have more significant impact on M&As activities. A positive economic environment is needed for smoothening of the operation of the banks. GDP and inflation indicate a statistically significant impact on operational performance. Although the coefficient of GDP is not significant in the pre-M&As period, in post M&As, it has a positive impact. For every 1 unit increase in the level of GDP, that would increase the operational performance by 5.037 units at a 5% significant level. The finding is further supported by Dang (2016) and Wang (2014) who suggested that GDP has a positive and significant impact on encouraging M&As activities. Another macro-economic variable, namely inflation, indicates negative impact on operational performance.

**Table 3: Multivariate results of the bank's operational performance (ROA)**

|                            | Pre M&A              |                      |                      | Post-M&A             |                      |                      |
|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|                            | POLS                 | FE                   | RE                   | POLS                 | FE                   | RE                   |
| BSTA                       | -0.363***<br>(0.000) | -0.538***<br>(0.000) | -0.363***<br>(0.000) | 0.764***<br>(0.001)  | 0.765***<br>(0.000)  | 0.764***<br>(0.000)  |
| Escale                     | -0.042*<br>(0.101)   | -0.013*<br>(0.005)   | -0.042*<br>(0.107)   | 0.035***<br>(0.001)  | 0.035***<br>(0.000)  | 0.035***<br>(0.000)  |
| Escope                     | -0.0568<br>(0.721)   | -0.012*<br>(0.074)   | "-0.057"<br>(0.720)  | 0.00618<br>(0.237)   | 0.00621**<br>(0.020) | 0.00618<br>(0.230)   |
| NFIR                       | 0.073***<br>(0.002)  | 0.023***<br>(0.009)  | 0.074**<br>(0.050)   | -0.315*<br>(0.098)   | -0.316*<br>(0.085)   | -0.315*<br>(0.090)   |
| LIDY                       | 0.00471<br>(0.490)   | -0.00497<br>(0.161)  | 0.00471<br>(0.488)   | -0.0110<br>(0.854)   | -0.0108<br>(0.854)   | -0.0110<br>(0.853)   |
| CR                         | 0.042**<br>(0.047)   | -0.065***<br>(0.002) | 0.042**<br>(0.044)   | 0.210<br>(0.149)     | -0.210**<br>(0.006)  | 0.210<br>(0.141)     |
| CAP                        | -0.038***<br>(0.007) | 0.067***<br>(0.000)  | -0.038***<br>(0.006) | 0.132*<br>(0.095)    | 0.133*<br>(0.070)    | 0.132*<br>(0.087)    |
| GDP                        | 16.59***<br>(0.000)  | 3.580<br>(0.488)     | 16.59***<br>(0.000)  | 5.028***<br>(0.000)  | 5.037***<br>(0.000)  | 5.028***<br>(0.000)  |
| INF                        | -0.0686<br>(0.655)   | -0.236*<br>(0.086)   | -0.0686<br>(0.654)   | 4.016*<br>(0.062)    | -3.984**<br>(0.040)  | 4.016*<br>(0.055)    |
| FIN                        |                      |                      |                      | 0.658*<br>(0.057)    | 0<br>(0)             | 0.658**<br>(0.050)   |
| _cons                      | -13.38***<br>(0.000) | 2.065<br>(0.700)     | -13.38***<br>(0.000) | -32.97***<br>(0.000) | -32.95***<br>(0.000) | -32.97***<br>(0.000) |
| Chow test: POLS vs FE      | 0.004                |                      |                      | 0.000                |                      |                      |
| LIM test: POLS vs RE       | 1.000                |                      |                      | 1.000                |                      |                      |
| Hausman test: FE vs RE     | 0.000                |                      |                      | 0.000                |                      |                      |
| R-sq                       | 0.520                |                      |                      | 0.803                |                      |                      |
| R-sq within                |                      | 0.1427               | 0.0836               |                      | 0.3673               | 0.0369               |
| R-sq between               |                      | 0.037                | 0.499                |                      | 0.283                | 0.967                |
| R-sq overall               |                      | 0.034                | 0.186                |                      | 0.2325               | 0.8027               |
| N                          | 101                  | 101                  | 101                  | 52                   | 52                   | 52                   |
| p-values in parentheses    |                      |                      |                      |                      |                      |                      |
| *p<0.1 ** p<0.05,***p<0.01 |                      |                      |                      |                      |                      |                      |

NOTES: samples consist of 10 Islamic banks from 6 countries, a year from Q1 2004 to Q4 2020. Islamic banks (IB), Pre & post; all data set, Pre; 5 years before M&A deal, Post; 5 years after M&A, bank size total assets (BSTA), the cost to income (Scale), loan to deposit (Escope), the non-interest cost to non-interest income (NFIR), liquidity (LIDY), loan loss reserve to gross loan (CR), equity to total assets (CAP), gross domestic product (GDP), inflation (INF), financing (FIN).

### **Multivariate Results of M&A on Bank Stability (Z-score)**

Table 4 displays stability results of pre and post M&As for Islamic banks. In pre-M&As, the R-squared (within) of the stability (Zscore) is 0.829, which means that the explanatory variables explain the variance of the bank stability. Generally, a higher R-squared implies a better fit for the model.

*In the pre-M&As scenario*, bank size (total assets) shows a significant impact on the relationship between M&As and stability. The more in bank size would increase bank stability, whereas higher stability shows the lower probability of insolvency. As shown, 1 unit increases to the total assets, increasing bank stability by 4.517 units, statistically significant at 1% .

Intermediary roles (financial and non-financial) show a significant impact on stability. Financial intermediary roles, namely economies of scale and economies of scope, negatively impact stability. For every 1-unit increase (decreases) to the economies of scale that would tend to reduce the stability by 0.138 units that is statistically significant at 1% level. Similarly, economies of scope show the negative impact on stability. 1 unit increases to the economies of scope that would tend to reduce the stability by 0.020 units which is statistically significant at 5% levels. The non-financial intermediary role does not significantly impact the stability.

The control variables are bank-specific variables; liquidity, credit risk and capitalization and macro-economic variables; GDP and inflation are used. Based on the findings, it is shown that bank-specific variables significantly impact the stability of Islamic banks. Specifically, liquidity implies a significant effect on the stability of Islamic banks. For every 1 unit increases to the liquidity that would tend to increase the stability of Islamic bank by 0.024 units which is significant at 1% level. While credit risk does not show any impact on the stability of Islamic banks. Capitalization shows positive implications for both banks. Saying that 1 unit increase to capitalization would tend to increase the stability of the Islamic banks that is statistically significant at 1% level. The findings are consistent with Marembo (2012), who said that adequate capitals help lessen the chance that banks will become insolvent if sudden shocks occur, ensuring financial sector stability. According to the findings, it is observed that macro-economic variables; GDP and inflation show negative impact on the stability of the Islamic banks. Every 1 unit increase at GDP tends to reduce the stability of Islamic banks by 12.31 units at the significant level of 10%. Accordingly, inflation implies an impact on the stability of both banks by 1.816 units and 0.068 units which is significant at 1% and 5% levels. Therefore, it shows that the economic condition negatively impacts pre-M&As.

*In the post-M&As scenario*, the R-squared (within) of the Islamic bank's stability (Zscore) is 0.817. Meaning that the explanatory variables explain the variance of bank stability. Generally, a higher R-squared implies a better fit for the model.

Bank size (total assets) implies shows significant impact on the relationship between M&As and bank stability. Although the coefficient (0.051) is positive but not statistically significant in explaining the changes in Stability and hence left undiscussed. Meaning that 1 unit increase to bank size would increase bank stability by 3.494 units at a significant 5% level. Higher bank stability led to lower probability of bank insolvency.

Intermediary role (financial) also shows significant impact on the stability of the Islamic banks. Based on the findings, 1 unit increase to economies of scope would reduce the strength of Islamic banks by 0.050 units which is significant at 1% level. The rest of the variable's economies of scale and non-financial intermediary roles are not statistically significant in explaining the changes in stability and are left undiscussed.

Modes of financing is omitted since the paper selects fixed affect model. In the fixed-effects model, dummy variable is omitted since categorical variables do not vary with time and then Stata omits dummy for fixed effects. But in the POLS model, the results show that financing modes are positive and statistically significant at 10% level. The results conclude that cash financing impacts the stability of Islamic banks compared to stock financing.

Control variables, namely bank-specific variables (for example, liquidity, credit risk and capitalization) and macro-economic variables (for example, GDP and inflation), significantly impact the stability. Looking at the findings, 1 unit increase to liquidity would tend to increase the stability of Islamic banks by 0.057 units which is statistically significant at 5% levels. Likely, 1 unit increases to the capitalization that would increase the stability by 0.044 units which is significant at 5% level. Having mergers and acquisitions, banks can integrate capital which shows positive and statistically significant impact on the bank stability. The findings are consistent with Marembo (2012), who said that adequate capitals help lessen the chance that banks will become insolvent if sudden shocks occur, ensuring financial sector stability. Lastly, credit risk does not show statistically significant in explaining the changes in stability and hence the results are left undiscussed. Macroeconomic variable (GDP) indicates positive impact on stability. It is saying that a good and favorable economy is fundamental and crying need for business development. The findings show that 1 unit increase to the GDP would tend to increase the stability of the Islamic banks by 0.051 units which is significant at 10% levels. At the same time, inflation does not show any significant impact on the stability of both banks.

**Table 4: Multivariate results of bank stability (Z-score)**

|  | Pre M&A              |                      |                      | Post M&A             |                      |                      |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|  | POLS                 | FE                   | RE                   | POLS                 | FE                   | RE                   |
| BSTA   | 4.517***<br>(0.000)  | 4.517***<br>(0.000)  | 4.517***<br>(0.000)  | -0.072**<br>(0.034)  | 0.051<br>(0.126)     | -0.072**<br>(0.029)  |
| Escale   | -0.138***<br>(0.000) | -0.138***<br>(0.000) | -0.138***<br>(0.000) | 0.013<br>(0.411)     | -0.012<br>(0.318)    | 0.013<br>(0.407)     |
| Escope   | -0.020**<br>(0.025)  | -0.020**<br>(0.023)  | -0.020<br>(0.123)    | 0.067<br>(0.938)     | -0.05***<br>(0.002)  | 0.067<br>(0.938)     |
| NFIR   | -0.092<br>(0.491)    | -0.092<br>(0.490)    | -0.092<br>(0.490)    | 0.155***<br>(0.000)  | 0.0575<br>(0.150)    | 0.155***<br>(0.000)  |
| LIDY   | 0.024***<br>(0.005)  | 0.024***<br>(0.005)  | 0.024***<br>(0.005)  | 0.034<br>(0.971)     | 0.057**<br>(0.043)   | 0.032<br>(0.971)     |
| CR   | 0.137<br>(0.413)     | -0.137<br>(0.411)    | 0.137<br>(0.411)     | 0.085***<br>(0.000)  | -0.006<br>(0.648)    | 0.085***<br>(0.000)  |
| CAP  | 0.905***<br>(0.000)  | 0.905***<br>(0.000)  | 0.905***<br>(0.000)  | 0.032**<br>(0.013)   | 0.044**<br>(0.047)   | 0.032***<br>(0.010)  |
| GDP  | -12.31*<br>(0.101)   | -12.31*<br>(0.098)   | -12.31*<br>(0.098)   | 0.559***<br>(0.000)  | 0.0514***<br>(0.000) | 0.559***<br>(0.000)  |
| INF  | -1.816**<br>(0.031)  | -1.816***<br>(0.009) | -1.816***<br>(0.009) | 0.226<br>(0.509)     | 0.246<br>(0.109)     | 0.226<br>(0.506)     |
| FIN  |                      |                      |                      | 0.324***<br>(0.000)  | 0<br>(.)             | 0.324***<br>(0.000)  |
| _cons  | -0.830<br>(0.920)    | -0.830<br>(0.920)    | -0.830<br>(0.920)    | -2.228***<br>(0.009) | 0.999<br>(0.569)     | -2.228***<br>(0.007) |
| Chow test: POLS vs FE                                  | 0.000                |                      |                      | 0.000                |                      |                      |
| LIM test: POLS vs RE                                   | 1.000                |                      |                      | 1.000                |                      |                      |
| Hausman test: FE vs RE                                 | 0.000                |                      |                      | 0.000                |                      |                      |
| R-sq   | 0.787                |                      |                      | 0.904                |                      |                      |
| R-sq within  |                      | <b>0.829</b>         | 0.795                |                      | <b>0.8168</b>        | 0.5306               |
| R-sq between   |                      | <b>0.233</b>         | 0.822                |                      | <b>0.166</b>         | 0.8893               |
| R-sq overall   |                      | <b>0.426</b>         | 0.787                |                      | <b>0.1356</b>        | 0.9                  |
| N  | 136                  | <b>136</b>           | 136                  | 64                   | <b>64</b>            | 64                   |
| p-values in parentheses<br>*p<0.1 ** p<0.05, ***p<0.01 |                      |                      |                      |                      |                      |                      |

NOTES: samples consist of 10 Islamic banks and from 6 countries, a year from Q1 2004 to Q4 2020. Islamic banks (IB), Pre & post; all data set, Pre; 5 years before M&A deal, Post; 5 years after M&A, bank size total assets (BSTA), cost to income (Scale), loan to deposit (Escope), the non-interest cost to non-interest income (NFIR), liquidity (LIDY), loan loss reserve to gross loan (CR), equity to total assets (CAP), gross domestic product (GDP), inflation (INF), financing (FIN).

### **Mediation role of market structure between M&A and operational performance (ROA)**

Table 5 presents the mediation effects of LHHI on the relationship between M&As and operational performance (ROA). Based on the findings, it is observed that LHHI mediates (i.e., partial mediation; complementary & competitive and full mediation; indirect only) the relationship of M&As and operational performance (ROA).

In pre-M&As scenario, market structure (LHHI) does not show any significant impact on the relationship of M&As and operational performance (ROA). And hence the results are left undiscussed. While, in post M&As, R-sq LHHI and ROA are 0.334 & 0.413. R-sq implies variance of the LHHI and ROA that is explained by the explanatory variables.

Bank size (operating income) shows complementary mediation effects. In contrast, banks size (total assets and total deposits) implies complementary mediation while bank size (operating income) shows indirect only mediation effects. Intermediary roles (financial and non-financial) do not show any mediation effects. More specially, the financial intermediary role such as economies of scale and economies of scope and the non-financial intermediary role such as the non-interest expense to non-interest income show complementary mediation effects.

Control variables also show mediation effects. Credit risk shows indirect only mediation effects, capitalization and inflation show complementary mediation effects, and GDP shows competitive mediation effects of LHHI on the relationship of M&As and operational performance (ROA). Liquidity shows competitive mediation effects, credit risk and GDP show complementary mediation effects, while capitalization implies indirect mediation effects of LHHI on the relationship of M&As and operational performance (ROA). These mediation relationships are shown in the diagram as per Appendix Figure A2.1.

**Table 5: Statistically Significant Values (The Structural Model) of operational performance (ROA) for Islamic banks**

|             |                                 | Pre M&A |         | Post M&A |         |
|-------------|---------------------------------|---------|---------|----------|---------|
| Panel-A     | (X on M)                        | Coef.   | p-value | Coef.    | p-value |
| BSTA        | ->market structure (LHHI)       | 0.014   | 0.282   | 0.005    | 0.834   |
| BSTD        | ->market structure (LHHI)       | -0.029  | 0.005   | -0.03    | 0.117   |
| BSOI        | ->market structure (LHHI)       | 0.012   | 0.152   | -0.01    | 0.050   |
| Escale      | ->market structure (LHHI)       | 0.000   | 0.569   | 0.000    | 0.348   |
| Escope      | ->market structure (LHHI)       | 0.000   | 0.683   | 0.000    | 0.541   |
| NFIR        | ->market structure (LHHI)       | 0.000   | 0.996   | 0.000    | 0.966   |
| LIDY        | ->market structure (LHHI)       | 0.000   | 0.233   | 0.000    | 0.447   |
| CR          | ->market structure (LHHI)       | 0.001   | 0.156   | -0.01    | 0.083   |
| CAP         | ->market structure (LHHI)       | 0.003   | 0.001   | 0.001    | 0.001   |
| GDP         | ->market structure (LHHI)       | -0.333  | 0.000   | -0.07    | 0.000   |
| INF         | ->market structure (LHHI)       | 0.008   | 0.096   | 0.054    | 0.000   |
| Panel-B     | (M on Y)                        |         |         |          |         |
| LHHI        | ->operational performance (ROA) | 0.105   | 0.973   | 1.230    | 0.000   |
| Panel-C     | (X on Y)                        |         |         |          |         |
| BSTA        | ->operational performance (ROA) | 0.007   | 0.986   | -0.26    | 0.213   |
| BSTD        | ->operational performance (ROA) | 0.060   | 0.752   | 0.268    | 0.171   |
| BSOI        | ->operational performance (ROA) | -0.132  | 0.714   | 0.107    | 0.063   |
| Escale      | ->operational performance (ROA) | -0.012  | 0.001   | -0.01    | 0.000   |
| Escope      | ->operational performance (ROA) | -0.004  | 0.483   | 0.001    | 0.265   |
| NFIR        | ->operational performance (ROA) | 0.000   | 0.869   | 0.000    | 0.050   |
| LIDY        | ->operational performance (ROA) | 0.003   | 0.521   | 0.001    | 0.323   |
| CR          | ->operational performance (ROA) | 0.009   | 0.785   | 0.017    | 0.689   |
| CAP         | ->operational performance (ROA) | -0.001  | 0.937   | 0.040    | 0.001   |
| GDP         | ->operational performance (ROA) | 2.781   | 0.003   | 0.155    | 0.011   |
| INF         | ->operational performance (ROA) | 0.003   | 0.982   | 0.172    | 0.110   |
| R-sq (LHHI) |                                 | 0.392   |         | 0.334    |         |
| R-sq (ROA)  |                                 | 0.187   |         | 0.413    |         |

NOTES: \*,\*\*,\*\*\* statistically significant at 10%, 5% and 1%. Hair et al. (2013) recommends for the t-value 1.96,  $p < 0.05$  for the mediation effects, thus, this paper will be selecting the one with a high confidence level ( $\alpha = 0.05$  or 0.01). The null hypothesis will be rejected if the t-value exceeds 1.96 (at  $p < 0.05$ ), i.e., there is no mediating/indirect effect between the determinants of M&A and bank's operational performance (ROA)

### **Mediation Test (Bootstrapping t-test) Results of Operational Performance (ROA)**

In pre-M&As scenario, market structure (LHHI) does not show any mediation effects on the relationship M&As, and operational performance (ROA) and hence the results of Bootstrapping t-test do not show any significance among the variables.

In the post M&As scenario, few variables of Islamic banks show strong mediation effects. Bank size (operating income), intermediary financial role (economies of scale) and control variables capitalization and GDP show strong mediation effects.



**Table 6: Mediation Test Analysis Results of Operational Performance (ROA)**

|                     | Pre M&A           |                | Post M&A          |                |
|---------------------|-------------------|----------------|-------------------|----------------|
|                     | Bootstrap t-stats | Mediation Role | Bootstrap t-stats | Mediation Role |
| BSTA->LHHI->ROA     | 0.010             | not support    | -1.300            | not support    |
| BSTD->LHHI->ROA     | 0.270             | not support    | 1.460             | not support    |
| BSOI ->LHHI ->ROA   | -0.490            | not support    | 2.640             | support        |
| Escale ->LHHI ->ROA | -3.000            | support        | -3.040            | support        |
| Escope ->LHHI ->ROA | -0.670            | not support    | 1.440             | not support    |
| NFIR ->LHHI ->ROA   | 0.300             | not support    | 1.220             | not support    |
| LIDY ->LHHI ->ROA   | 0.730             | not support    | 1.150             | not support    |
| CR ->LHHI ->ROA     | 0.260             | not support    | 0.620             | not support    |
| CAP ->LHHI ->ROA    | -0.080            | not support    | 3.400             | support        |
| GDP ->LHHI ->ROA    | 1.260             | not support    | 3.520             | support        |
| INF ->LHHI ->ROA    | 0.020             | not support    | 0.850             | not support    |

NOTES: \*,\*\*,\*\*\* statistically significant at 10%, 5% and 1%. Hair et al. (2013) recommends for the t-value 1.96,  $p < 0.05$  for the mediation effects, thus, this paper will be selecting the one with a high confidence level ( $\alpha = 0.05$  or 0.01). The null hypothesis will be rejected if the t-value exceeds 1.96 (at  $p < 0.05$ ), i.e., there is no mediating/indirect effect between the determinants of M&A and bank's operational performance (ROA)

### **Mediation role of market structure between M&A and bank stability**

In pre-M&As scenario, market structure (LHHI) does not mediate between M&As and bank stability and then the results are left undiscussed.

In post M&As scenario, R-sq of LHHI & ROA is 0.334 & 0.879 respectively. R-sq posits that the explanatory variables explain the variance of LHHI & ROA. Bank size (total assets & total deposits) show competitive mediation effects bank size be (operating income) imply the direct only mediation. Intermediary role (financial and non-financial) does not have any mediation effects. Control variables namely credit risk and GDP imply competitive mediation effects while Inflation shows complementary mediation effects. These mediation relationships are shown in the diagram as per Appendix Figure A2.1.

Control variables namely liquidity and capitalization show competitive mediation effects, credit risk shows indirect only mediation effects and GDP implies complementary mediation effects of LHHI on the relationship of M&As and bank stability (Zscore). Surprisingly, all variables except inflation show mediation effects (partial and full), significantly more significant than Islamic banks. These mediation relationships are shown in the diagram as per Appendix Figure A2.1.

**Table 7: Statistically Significant Value (The Structural Model) of stability (Z-score)**

|                |                           | Pre M&A      |                | Post M&A     |                |
|----------------|---------------------------|--------------|----------------|--------------|----------------|
| <b>Panel-A</b> | <b>(X on M)</b>           | <b>Coef.</b> | <b>p-value</b> | <b>Coef.</b> | <b>p-value</b> |
| BSTA           | ->market structure (LHHI) | 0.014        | 0.139          | 0.005        | 0.097          |
| BSTD           | ->market structure (LHHI) | -0.029       | 0.003          | -0.027       | 0.103          |
| BSOI           | ->market structure (LHHI) | 0.012        | 0.110          | -0.012       | 0.027          |
| Escale         | ->market structure (LHHI) | 0.000        | 0.444          | 0.000        | 0.342          |
| Escope         | ->market structure (LHHI) | 0.000        | 0.608          | 0.000        | 0.368          |
| NFIR           | ->market structure (LHHI) | 0.000        | 0.996          | 0.000        | 0.979          |
| LIDY           | ->market structure (LHHI) | 0.000        | 0.187          | 0.000        | 0.490          |
| CR             | ->market structure (LHHI) | 0.001        | 0.024          | -0.007       | 0.011          |
| CAP            | ->market structure (LHHI) | 0.003        | 0.000          | 0.001        | 0.224          |
| GDP            | ->market structure (LHHI) | -0.333       | 0.000          | -0.075       | 0.000          |
| INF            | ->market structure (LHHI) | 0.008        | 0.078          | 0.054        | 0.000          |
| <b>Panel-B</b> | <b>(M on Y)</b>           |              |                |              |                |
| LHHI           | ->Bank Stability (Zscore) | 19.147       | 0.054          | -4.527       | 0.003          |
| <b>Panel-C</b> | <b>(X on Y)</b>           |              |                |              |                |
| BSTA           | ->Bank Stability (Zscore) | 3.647        | 0.198          | 15.546       | 0.002          |
| BSTD           | ->Bank Stability (Zscore) | -2.675       | 0.274          | -13.48       | 0.001          |
| BSOI           | ->Bank Stability (Zscore) | 3.760        | 0.015          | -0.837       | 0.479          |
| Escale         | ->Bank Stability (Zscore) | -0.127       | 0.019          | -0.163       | 0.000          |
| Escope         | ->Bank Stability (Zscore) | -0.019       | 0.489          | 0.005        | 0.405          |
| NFIR           | ->Bank Stability (Zscore) | -0.001       | 0.902          | -0.005       | 0.346          |
| LIDY           | ->Bank Stability (Zscore) | 0.021        | 0.722          | 0.020        | 0.208          |
| CR             | ->Bank Stability (Zscore) | 0.129        | 0.696          | -1.491       | 0.001          |
| CAP            | ->Bank Stability (Zscore) | 0.903        | 0.000          | 1.270        | 0.000          |
| GDP            | ->Bank Stability (Zscore) | -12.292      | 0.154          | -2.260       | 0.085          |
| INF            | ->Bank Stability (Zscore) | -1.825       | 0.357          | -3.675       | 0.054          |
| R-sq (LHHI)    |                           | 0.392        |                | 0.334        |                |
| R-sq (Z-score) |                           | 0.803        |                | 0.879        |                |

NOTES: Panel -A represents the impact of X on M, Panel-B states the impact of M on Y and Panel C implies X on Y, respectively. Islamic bank samples pre-136 and post 194

### **Mediation Test (Bootstrapping t-test) Results of Bank Stability (ROA)**

Table 8 shows the mediation test (Bootstrapping t-test) analysis results of LHHI between M&As and bank stability (Zscore) which show that results suggest certain specific factors have a strong mediation effect. In pre M&A scenario, market structure (LHHI) does not show any mediation effects on the relationship M&As and bank stability (Zscore). Hence, the results of Bootstrapping t-test do not show any significance among the variables. Whereas, in the post M&As scenario, Bank size (total assets & total deposits), intermediary financial role (economies of scale) and control variables capitalization, GDP and inflation show strong mediation effects.

**Table 8: Mediation Test Analysis Results of Bank Stability (Z-Score)**

|                      | Pre M&A              |                   | Post M&A             |                   |
|----------------------|----------------------|-------------------|----------------------|-------------------|
|                      | Bootstrap<br>t-stats | Mediation<br>Role | Bootstrap<br>t-stats | Mediation<br>Role |
| BSTA ->LHHI ->Zscore | 1.360                | not support       | 3.610                | support           |
| BSTD ->LHHI ->Zscore | -0.980               | not support       | -3.550               | support           |
| BSOI ->LHHI ->Zscore | 2.550                | support           | -0.790               | not support       |
| Escale->LHHI->Zscore | -1.980               | Not support       | -5.160               | support           |
| Escope->LHHI->Zscore | -0.660               | not support       | 0.800                | not support       |
| NFIR ->LHHI ->Zscore | -0.200               | not support       | -0.970               | not support       |
| LIDY ->LHHI ->Zscore | 0.260                | not support       | 1.250                | not support       |
| CR ->LHHI ->Zscore   | 0.290                | not support       | -3.120               | not support       |
| CAP ->LHHI ->Zscore  | 3.000                | support           | 6.880                | support           |
| GDP ->LHHI ->Zscore  | -0.570               | not support       | -2.470               | support           |
| INF ->LHHI ->Zscore  | -1.200               | not support       | -1.600               | support           |

NOTES: \*,\*\*,\*\*\* statistically significant at 10%, 5% and 1%. Hair et al. (2013) recommends for the t-value 1.96,  $p < 0.05$  for the mediation effects, thus, this paper will be selecting the one with a high confidence level ( $\alpha = 0.05$  or  $0.01$ ). The null hypothesis will be rejected if the t-value exceeds 1.96 (at  $p < 0.05$ ), i.e., there is no mediating/indirect effect between the determinants of M&A and bank's stability (Zscore).

#### **4.5 Goodness of Fit Test of the Mediation Results**

Table 9 shows the Goodness of Fit Test of the Mediation Results. A number of the goodness of fit criteria are reported in the table. For example, Chi-square, RMSEA, (S)RMR, and CFI. A good model fit would provide an insignificant result at a 0.05 threshold (Barret, 2007). Thus, the chi-square statistics are often referred as either a badness of fit (Kline, 2015) or a lack of fit measure. Cut off for good fit is p-value  $>0.05$  (Kline, 2015). One of the most significant advantages of the RMSEA is its ability to calculate a confidence interval around its value. This is possible due to the known distribution value of the statistics and subsequently, allows for the null hypothesis (poor fit) to be tested more precisely (McQuitty, 2004). The cut-off value of RMSEA should be less than 0.08 (Kline, 2015). The cut of values for the (S) RMR ranges from zero to 1.0 with a well-fitting model obtaining values less than 0.05 (Diamantopoulos et al., 2000), however, values more than 0.08 are deemed acceptable. SRMR close to zero implies good fits of the model (Kline, 2015). A cut-off criterion of  $\leq 0.90$  was initially advanced, however, a recent study has shown that a value of more than 0.90 is needed to ensure that misspecified models are not accepted. Meanwhile, Kline (2015) stated that a value of more than 0.85 is presently recognized as indicative of good fit. All the criteria are good since the p-value is lower than 0.05 (see Table 9).

**Table 9: Goodness of Fit Test of the Mediation Results**

| <b>Model good of fit index</b> | <b>Name</b>                              | <b>Cut-off value</b> | <b>Model outcome analysis</b> | <b>Explanation</b> | <b>Description</b>  |
|--------------------------------|--|----------------------|-------------------------------|--------------------|---|
| $\chi^2$ (Chi Square)          | Model chi-square                         | <p=0.05              | 0.000                         | Good               | Assess the overall fit and the discrepancy between the sample and fitted covariance matrices. Sensitive to sample size. H0: The model fits perfectly. |
| RMSEA                          | Root Mean Square Error of Approximation  | $\leq 0.08$          | 0.000                         | Good               | A parsimony-adjusted index. Values closer to 0 represent a good fit.  |
| (S)RMR                         | (Standardized) Root Mean Square Residual | <0.08                | 0.000                         | Good               | The square root of the difference between the residuals of the sample covariance matrix and the hypothesized model.                                   |
| CFI                            | Comparative Fit Index                    | $\geq 0.95$          | 1.000                         | Good               | A revised form of NFI. Not very sensitive to sample size. Compares the fit of a target model to the fit of an independent, or null, model.            |

#### **4.6 Decisions whether to accept/ reject the research hypotheses**

Based on the results of the estimations, this paper accepts the following research hypotheses.

**Hypothesis 1; H1: Bank sizes (e.g., total assets, total deposits & operating income) significantly impact operational performance and stability for Islamic banks**

This paper accepts the null hypothesis that bank size significantly impacts operational performance and stability.

**Hypothesis 2; H1: Intermediary roles (e.g., financial & non-financial intermediary roles) significantly impact bank performance and stability for Islamic banks**

The bank works as an intermediary between depositors and economic agents. It is expected that the intermediary role has significant impact on operational performance and bank stability. This paper accepts the null hypothesis that the null hypothesis of intermediary roles significantly impacts bank performance and bank stability. Intermediary roles, namely financial (economies of scale and economies of scope) and non-financial (non-interest expense to non-interest income) intermediary roles have significant impacts on operational performance and stability.

**Hypothesis 3; H1: Modes of financing (cash or stock) have significant impact on the operational performance and stability for Islamic banks**

The paper accepts the null hypothesis that Modes of financing (cash or stock) have significant impact on the operational performance and stability for Islamic banks

**Hypothesis 4; H1: Bank-specific variables (e.g., capitalization, credit risk & liquidity) significantly impact operational performance and stability for Islamic banks**

This paper accepts the null hypothesis that bank-specific variables have significant impact on operational performance and bank stability. Bank-specific variables, namely capitalization, liquidity, and credit, statistically significant impact on operational performance and stability.

**Hypothesis 5; H1: Macro-economic variables (e.g., GDP & INF) significantly impact operational performance and stability for Islamic banks**

This paper accepts the null hypothesis that macro-economic variables (GDP & INF) significantly impact operational performance and stability for Islamic banks. Favorable economic condition is better for M&As, especially for banks. Macroeconomic variables significantly impact both operational performance and stability.



### **Hypothesis 6; H1: Market structure (e.g., LHHI) mediates the relationship between M&A and operational performance and stability for Islamic banks**

The null hypothesis of market structure mediates the relationship between factors of M&A and operational performance and bank stability. The findings show that factors show both partial and full mediation effects of LHHI on the relationship between M&As and operational performance and bank stability (Z-score). Furthermore, BSTA, BSTD, CAP and GDP show indirect effects for Islamic banks.

### **3. Conclusions**

This paper examines and analyses the factors associated with M&A affecting on the operational performance and stability for Islamic banks along with the mediation role of market structure. Return on asset (ROA) and return on equity (ROE) are used for operational performance while Z-score represents the bank stability. Several factors associated with M&As namely bank size, intermediary role, modes of financing, bank-specific variables and macro-economic variables are used to examine and analyze operational performance (ROA & ROE) and bank stability (Z-score). The Herfindahl-Hirschman Index (HHI) is used to measure the market structure.

The findings imply that M&As improve operational performance while stability does not show any significant difference in pre and post M&As. Market structure mediates the relationship of M&As with operational performance and stability. Moreover, small-sized banks imply a better impact on operational performance while large and medium-sized banks show a better impact on banking sectors' stability. In pre-M&As scenario, the market structure does not mediate between M&As with operational performance and stability. The number of observations (i.e., banks and country) in this paper remains a limitation. And hence future research would include more samples of M&As of Islamic banks.

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## Appendix A

**Table A1.1** Descriptive statistics of M&A performance in the banking sector

|   | Pre M&A   | Post M&A |
|---|-----------|----------|
| <b>Operational performance</b>          |           |          |
| ROA                                     | 1.017     | 1.681*   |
| ROE                                     | 5.261*    | 5.723    |
| NIM                                     | 2.155*    | 2.412*   |
| <b>bank stability</b>                   |           |          |
| Zscore                                  | 22.824    | 19.620*  |
| <b>Bank size</b>                        |           |          |
| BSTA                                    | 6.855*    | 6.587    |
| BSTD                                    | 6.559     | 6.373    |
| BSOI                                    | 5.161     | 4.565*   |
| <b>Financial intermediary roles</b>     |           |          |
| Escale                                  | 38.492*   | 35.237   |
| Escope                                  | 26.118    | 21.342   |
| <b>Non-financial intermediary roles</b> |           |          |
| NFIR                                    | -111.591* | -94.727  |
| <b>Control variables</b>                |           |          |
| LIDY                                    | 11.490*   | 8.672*   |
| CR                                      | 2.157**   | 0.793    |
| CAP                                     | 15.355    | 13.036   |
| <b>Macro-economic variables</b>         |           |          |
| GDP                                     | 1.082*    | 2.956*   |
| INF                                     | 1.699     | 1.385    |
| <b>Modes of financing</b>               |           |          |
| FIN                                     | 0.789     | 0.793**  |
| <b>Market structure</b>                 |           |          |
| LHHI                                    | 3.521*    | 3.523    |
| CR3                                     | 0.825     | 0.826    |
| N                                       | 190       | 195      |

NOTES: \*, \*\*, \*\*\* statistical significant at 10%, 5%, and 1%. Samples consist of 24 banks including 10 Islamic banks from 6 countries, a year from Q1 2004 to Q4 2020. Pre & post; all data set, Pre; five years before M&A deal, Post; five years after M&A deals, ROA; return on asset, ROE; return on equity, NIM; net interest margin, Z-score; bank stability, BSTA; bank size total assets, BSTD; bank size total deposits, BSOI; bank size operating income, Escale; cost to income, Escope; loan to deposit, NFIR; non-interest cost to non-interest income, LIDY; liquidity, CR; loan loss reserve to gross loan, CAP; equity to total assets, GDP; gross domestic product, INF; inflation, LHHI; \*, \*\*, \*\*\*, represent significant at 1%, 5% and 10% level respectively.

Table A1.2; Correlation matrix of the key variables

|        | ROA      | ROE     | BSTA     | BSTD     | BSOI     | Escale   | Escope   | NFIR     | LIDY     | CR       | CAP      | GDP      | INF |
|--------|----------|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----|
| ROA    | 1        |         |          |          |          |          |          |          |          |          |          |          |     |
| ROE    | 0.2966*  | 1       |          |          |          |          |          |          |          |          |          |          |     |
| BSTA   | 0.0923*  | 0.4586* | 1        |          |          |          |          |          |          |          |          |          |     |
| BSTD   | 0.0537   | 0.4539* | 0.9517*  | 1        |          |          |          |          |          |          |          |          |     |
| BSOI   | 0.1834*  | 0.4775* | 0.8151*  | 0.7766*  | 1        |          |          |          |          |          |          |          |     |
| Escale | -0.071   | 0.0677  | -0.0944* | -0.0631  | -0.1632* | 1        |          |          |          |          |          |          |     |
| Escope | -0.0593  | 0.0264  | 0.0807*  | 0.0851*  | 0.0178   | 0.5973*  | 1        |          |          |          |          |          |     |
| NFIR   | -0.057   | 0.0292  | -0.2145* | -0.2066* | -0.1753* | 0.3543*  | 0.0744   | 1        |          |          |          |          |     |
| LIDY   | 0.0338   | 0.4862* | 0.2994*  | 0.3157*  | 0.2310*  | 0.5680*  | 0.2070*  | 0.1320*  | 1        |          |          |          |     |
| CR     | 0.0445   | 0.1736* | -0.0274  | -0.0503  | -0.0606  | 0.3385*  | 0.2105*  | 0.2215*  | 0.2831*  | 1        |          |          |     |
| CAP    | 0.1287*  | 0.2809* | 0.0852*  | 0.0983*  | 0.0898*  | 0.7189*  | 0.5640*  | 0.0695   | 0.5421*  | 0.3433*  | 1        |          |     |
| GDP    | 0.1044*  | 0.1032* | 0.5331*  | 0.5078*  | 0.4646*  | -0.1951* | 0.0292   | -0.4124* | -0.1664* | -0.2752* | -0.0313  | 1        |     |
| INF    | -0.0844* | -0.0613 | -0.5433* | -0.5159* | -0.3997* | 0.0491   | -0.1485* | 0.4221*  | -0.1058* | 0.0959*  | -0.1983* | -0.5553* | 1   |

Where, ROA; return on asset, ROE; return on equity, BSTA; bank size total assets, BSTD; bank size total deposits, BSOI; bank size operating income, Escale; cost to income, Escope; loan to deposit, NFIR; non-interest cost to non-interest income, LIDY; liquidity, CR; loan loss reserve to gross loan, CAP; equity to total assets, GDP; gross domestic product, INF; inflation and \* marks represent variables are significant at 5% level

Table A1.3 List of M&amp;A banks

| <b>M&amp;A (Islamic banks)</b> |                                      |              |     |      |       |
|--------------------------------|--------------------------------------|--------------|-----|------|-------|
| 1                              | Ithmaar Holding BSC                  | Bahrain      | M&A | 2009 | Cash  |
| 2                              | Al Salam Bank-Bahrain BSC            | Bahrain      | M&A | 2013 | Stock |
| 3                              | Warba Bank KSCP                      | Kuwait       | M&A | 2016 | Cash  |
| 4                              | Kuwait Finance House KSCP            | Kuwait       | M&A | 2011 | Cash  |
| 5                              | Meezan Bank Ltd                      | Pakistan     | M&A | 2014 | Cash  |
| 6                              | Masraf Al Rayan QSC                  | Qatar        | M&A | 2013 | Cash  |
| 7                              | Qatar International Islamic Bank QSC | Qatar        | M&A | 2011 | Cash  |
| 8                              | Al Rajhi Bank                        | Saudi Arabia | M&A | 2009 | Cash  |
| 9                              | Dubai Islamic Bank PJSC              | U.A.E.       | M&A | 2010 | Stock |
| 10                             | Abu Dhabi Islamic Bank PJSC          | U.A.E.       | M&A | 2014 | Cash  |

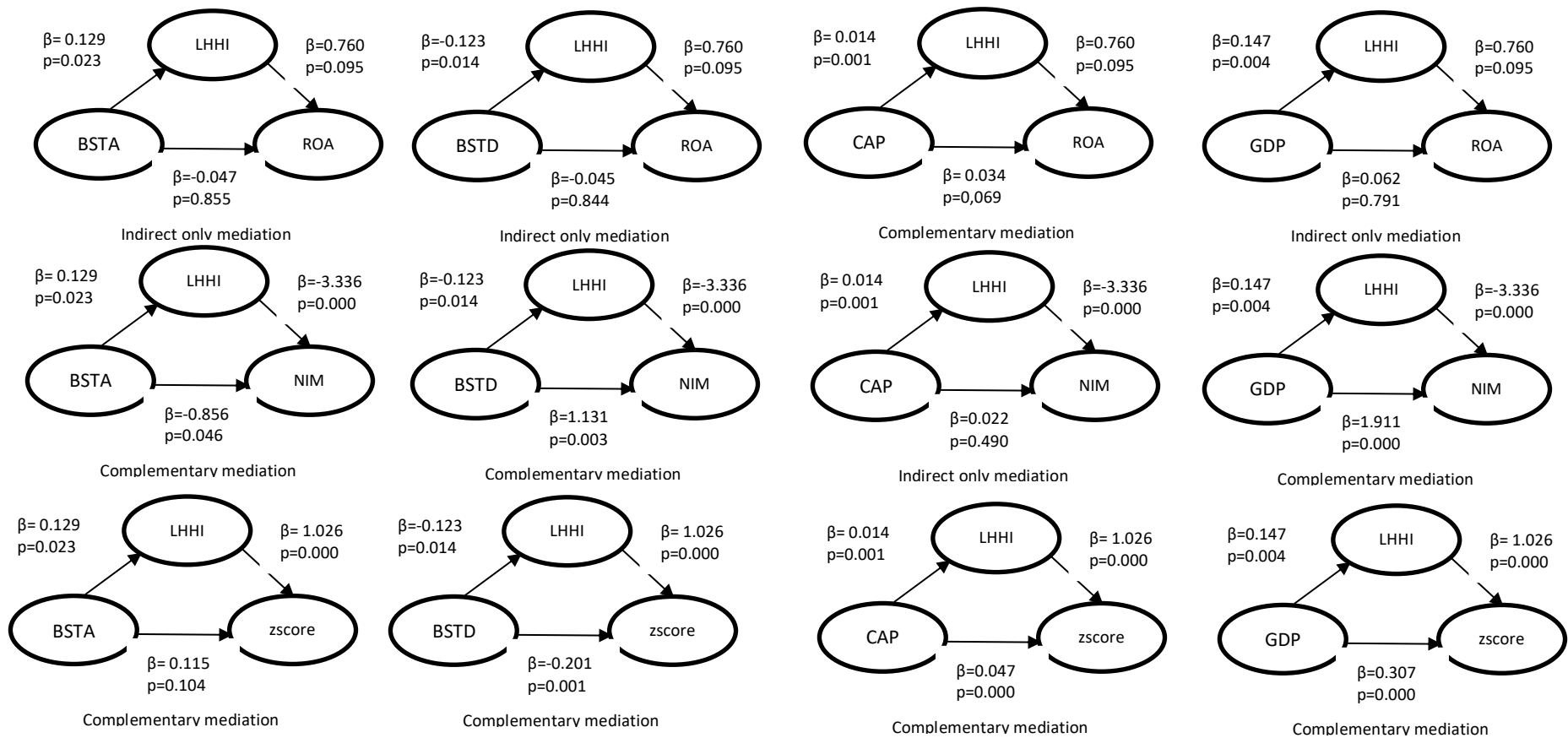


Figure A2.1: A Framework of Mediation Analysis Results Based on the Measurement of LHHI (Islamic bank)