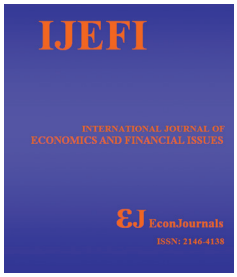

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The Determinants of Shariah Banks' Capital Structure

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ABSTRACT

This study is an endeavor to identify key significant determinants of capital structure for Shariah-tagged banks. A total of 47 Shariah banks' 9 years i.e. from 2013 to 2021 Balance Panel Data is used. The leverage ratio is nominated as a dependent variable, whereas, liquidity, return on assets, gross domestic product, return on equity, tangibility, growth, size, and capital adequacy ratio are designated as explanatory variables. The Panel Data Static model and Dynamic model via the Generalized Method of Moments (GMM) are executed. The results specify that liquidity, gross domestic product, tangibility, lagged dependent variable, and profitability i.e. measured by return on equity are positively significant determinants. Besides, the significant lagged variable, tangibility, liquidity, and existence of SOA infer the significance of the Dynamic Trade-off theory. Based on the identified significant determinants, the policymakers can develop similar policies to formulate the capital structure of whole Shariah banks.

Keywords: Capital Structure, Shariah Banks, Panel Data Static Models, GMM
JEL Classifications: G31, G32, G21, C33

1. INTRODUCTION

The capital structure of any business consists of dissimilar financial sources that are adopted to finance its growth, assets, and operations (Rehan et al., 2023). Remarkably, the capital structure of financial institutions, especially, the banks is dissimilar from those that are non-financial firms. The banks' capital structure is considered as a different case because it contains unique attributes, such as it avails depositor funds and is also bound by central banks and various regulation authorities to preserve its capital. Technically, the capital structure of banks deals with debt-to-equity and capital-to-deposit ratios (Kadhafi et al., 2024; Kaufman, 1992). Also, in comparison with non-financial firms, the construction of capital structure for banks requires extra attention because it not only deals with its value and profitability but also focuses on maintaining its stability (Hernawati et al., 2021). Importantly, when it comes to the case of Shariah banks then it becomes extremely challenging. The Shariah banks are those that follow Islamic principles and ignore all those transactions and businesses that are prohibited in the religion of Islam (Kurniawan et al., 2024).

The Shariah banks also named Islamic banks, prohibit the charging of interest and investing in all those sorts of businesses that are not allowed in Islam such as alcohol, gambling, etc. (Rokhimah et al., 2024). Typically, these banks offer only those products that comply with Islamic ideologies, like profit-sharing procedures i.e. Mudarabah, joint ventures i.e. Musharakah, and trade-based transactions i.e. Murabahah. Fundamentally, the important characteristic of Shariah Bank is the offering of profit-sharing investment accounts (PSIA) without involving any predetermined payment of interest on customers' deposits (Shilbayeh and Grassa, 2024). In other words, the goal of Shariah banks is to offer only those financial products and services that adhere to Islamic laws and ethics. As a result, the Shariah banks are not allowed to maintain their debt ratios freely and are bound by dissimilar governing frameworks on

adopting their equity and debt varieties (Mai et al., 2024; Guizani and Ajmi, 2021; Khan et al., 2020). The aforementioned aspects significantly impact the capital structure conserving practices of Shariah banks. Hence, Shariah banks always focus with full consideration while formulating capital structure. The prevailing theories of capital structure both former and recent versions seek to clarify why financial and non-financial firms adopt dissimilar mixes of equity and debt for financing purposes (Khan et al., 2021).

Currently, very limited empirical inquiries have been performed are available to identify the significant determinants of capital structure for Shariah followed banks (Sakti et al., 2017). Unlike existing literature on the capital structure determinants of non-Shariah banks, the empirical research that explored capital structure formulating practices of Shariah banks is still in the embryonic phase. However, Shariah banks' capital structure and its connected issues have gained special attention in the last few decades but former studies that explored capital structure preserving practices of Shariah banks offered mixed outcomes. Likewise, the theoretical inquiries on the capital structure of Shariah banks delivered mixed findings. Thus, the ongoing discussions among researchers about the capital structure of Shariah banks have still not provided conclusive findings. Notably, some scholars also raised questions on the applicability of existing theories and adopting capital structure practices in conjunction with Shariah values (Sakti et al., 2017; Al-Deehani et al., 1999). Thus, an extensive empirical inquiry is warranted to identify significant and key determinants of the capital structure for Shariah banks active in dissimilar countries.

Considering the existing research gap, this study is an endeavor to detect the significant capital structure determinants for Shariah Banks. Notably, several Muslim countries activate both financial groups i.e. Shariah and Non-Shariah parallel (Rehan and Abdul Hadi, 2019; Rehan et al., 2019). Hence, this study adopts 9-year financial data i.e. 2013-2021 of 47 Shariah banks that are operating in dissimilar countries (Table 1). The outcomes specify that profitability, growth, non-debt tax shield (NDTS), tangibility, gross domestic product, capital adequacy ratio and liquidity, are the significant determinants that impact the capital structure preserving practices of Shariah banks.

The remaining part of this empirical inquiry is divided into different sections such as the next section i.e. Section 2 discusses in detail the existing inquiries for Shariah banks. Then, Section 3 is set to clarify the adopted econometrics methods to conduct the analysis. Section 4 displays the results obtained after executing the analysis. Afterward, Section 5 i.e. discussion, explains and discusses the obtained outcomes. The last section 6 contains the conclusion of this inquiry.

Table 1: Shariah banks sample description (country of origin)

S#	Countries	Shariah Banks (listed)	Sample (%)
1	Indonesia	4	9
2	Bahrain	5	11
3	Egypt	3	6
4	United Arab Emirates	6	13
5	Pakistan	3	6
6	Bangladesh	4	9
7	Malaysia	3	6
8	Kuwait	4	9
9	Turkey	3	6
10	Jordan	2	4
11	Saudi Arabia	6	13
12	Qatar	4	9
Total		47	100

2. LITERATURE REVIEW

The conventional theories of capital structure support the use of debt over shareholders' equity and lay emphasis more on maximizing the wealth of shareholders. Thus, these traditional theories were created from the idea of enlarging and enhancing individuals' capital. Importantly, the applicability of these theories on Shariah banks is still dubious. The Shariah banks followed Islamic rules, thus, eliminate the concept of interest i.e. a major source of profit for the conventional banks' customers. Hence, offering interest-bearing loans and products and linking customers' deposits with interest seriously damage Shariah banks' structure. Considering this, several scholars have tried to explain why the leverage-connected determinants' theoretical relationships are dissimilar for Shariah and non-Shariah banks. Besides, by considering significant factors, several scholars also accepted the traditional leverage theories to explain relationships among the nominated determinants. For instance, Bukair (2019) and Toumi et al., (2012) explained the practices of Trade-off theory guidelines for Shariah banks that are operational in GCC countries. The Trade-off theory explains that firms should trade off their costs i.e. financial distress and benefits i.e. interest-based tax shield while constructing their capital structure. Moreover, this theory also considers the optimal level of leverage (Zandi et al., 2023; Ghani et al., 2023a). In contrast, some other scholars (Al-Hunnayan, 2020; Al-Harby, 2019) mentioned that Shariah banks' practices are in line with the guidelines provided by the Pecking Order theory. The Pecking Order theory suggests that firms first use internal funds, then debt and in the last if they still require more funds to fulfil their needs then they offer equity (Ghani et al., 2023b).

Visibly, limited empirical inquiries inspect the Shariah banks' capital structure-related practices. The former inquiries emphasize more on Shariah banks financing connected policies (Karim and Ali, 1989), developing theory-linked frameworks (Archer and Karim, 2006), and adoption of Islamic rules for Shariah banks funding related choices (Toumi et al., 2012). Nevertheless, one of the primary debates and empirical investigations on Shariah banks' capital structure appeared after the 1980s which was conducted by Karim and Ali (1989). This study examined the connections between the finance-related policies of Shariah banks to clarify the deviations in their maintained leverage. The researchers discussed the types of investors' equity and three different kinds of depositors' accounts, named investment accounts, current accounts, and savings accounts. This study concludes that in similarity with the conventional accounts, the Shariah bank shareholders have supervisory rights over the management. However, in this banking system, the investment account savers are not offered a definite determined interest-based return. As an alternative, they are offered to contribute in profits and also share the losses on their deposits. Interestingly, this study is considered among one of the pioneer investigations that deliberated leverage sustaining practices of Islamic banks. Subsequently, Al-Deehani et al. (1999) conducted a study that proposed an initial model for Shariah banks' capital

structure. This initial model was executed on twelve Shariah banks from 1989 to 1993. The outcomes of this inquiry were used by several Shariah banks to determine the profit share for investment-based account holders. Critically, this study ignored the impact of profit-sharing accounts on the leverage-maintaining practices of Shariah banks.

After that, Al-Farisi and Hendrawan (2012) performed a comparative analysis of Shariah followed banks and conventional banks' financial performance in Indonesia. Importantly, this study analysis\ was performed by selecting only three Shariah banks and 102 non-Shariah banks. Critically, there is an extreme dissimilarity between Shariah and non-Shariah bank sample sets. In the same vein, Alkhazaleh and Almsafir (2015) explored the capital structure determinants of fourteen banks that are working in Jordan. Notably, this investigation ignored the impact of microeconomics variables, the structure of the market, and the impact of taxes on the capital structure of banks. The above-discussed investigations confirm that former empirical investigations ignored overlooked several important aspects of Shariah banks' capital structure, for instance, Karim and Murinde (1999) ignored the impact of the profit-sharing account on leverage-preserving practices of Shariah banks. Likewise, Al-Farisi and Hendrawan (2012) did not construct the proper sample set in comparison with conventional banks' data sample set. Also, Alkhazaleh and Almsafir (2015) ignored the impact of microeconomic determinants, taxes, etc. on the leverage-maintaining practices of Shariah firms.

Moreover, Meero (2015) investigated the dissimilarities between the leverage-maintaining practices of conventional and Shariah banks. This study adopted eight conventional banks and eight Shariah banks' financial data during the period from 2005 to 2014 to perform the analysis. This study used debt-to-equity, debt-to-total assets, and equity-to-total assets as independent variables. Whereas, the size of the banks is taken as a dependent variable. The ROE and ROA are used to explore the financial performance of these banks. The conclusion specified the similarities in leverage maintaining practices of Shariah and conventional banks and in their financial performance. Also, the analysis indicated a significant but negative association of ROA with leverage and a positive association with equity-to-assets ratio. Most recently, Al Badarin and Ibrahim Abanda (2024) explored internal leverage-connected determinants for Middle East Shariah banks. This investigation was performed by using Panel Data of Shariah banks from 2011 to 2021. The book leverage is selected as a measure of leverage, whereas, NDTS, size, profitability, growth, liquidity, earning volatility, and liquidity are nominated as independent variables. The outcomes obtained from the descriptive analysis mentioned that Shariah banks are extravagantly using high debt. Likewise, it indicates positive impacts of tangibility, earning volatility, size, and growth on the leverage of Shariah banks. In contrast, a negative association between NDTS and liquidity is detected in Shariah banks' leverage. However, the analysis also reported the absence of any relationship between earning volatility and booked leverage.

Rehman (2023) inspected the influences of capital structure on the profitability of Shariah and non-Shariah banks that are working in Pakistan. The return on capital employed, return on equity, earnings per share, and return on assets are selected as dependent variables. However, short-term, long-term, and total liabilities to equity ratios are used as independent variables. The bank's size and growth are selected as control variables. By using 10 years of panel data and fixed effects analysis the outcome specifies the positive impact of capital structure on profitability. Similarly, Bukair (2019) explored the capital structure practices of the Gulf Corporation Council countries during the period 2009-2011 and by adopting generalized least square regression. The leverage is used as dependent and the size of the bank, tangibility, NDTS, age, growth, and gross domestic product (GDP) are used as independent variables. This study indicated bank size, age, and liquidity as positive and significant determinants for the leverage of GCC Shariah banks. Whereas, tangibility, growth and profitability are observed as insignificant determinants of leverage for GCC banks. Also, GDP and NDTS are observed negatively on the leverage of GCC-based Shariah banks. Later, Hoque and Liu (2022) compared the leverage determinants of Shariah and conventional banks over the selected time period i.e. 1995-2015. This study adopted regulatory capital, tier 1 capital, book leverage, and capital buffer as dependent variables. Similarly, profitability, market-to-book ratio, size, collateral, risk, dividend, etc. are selected as independent variables. The outcomes indicate that asset growth is a key determinant for capital structure and non-Shariah banks that adjust their capital structure promptly in comparison with Shariah banks.

The above-discussed inquiries that explore capital structure connected determinants for Shariah banks (Al Badarin and Ibrahim Abanda 2024; Rehman, 2023; Hoque and Liu 2022; Bukair, 2019; Alkhazaleh and Almsafir, 2015; Toumi et al., 2012; Al-Farisi and Hendrawan, 2012; Al-Deehani et al., 1999; Karim and Ali, 1989) are limited and do not provide consistent results. Thus, it is warranted to detect significant determinants of leverage that impact on capital structure constructing practices of these banks. To cover the detected gap, this study is an attempt to explore the main determinants that influence the capital structure of Shariah-followed banks. For this purpose and in line with former investigations (Table 1), this inquiry considers profitability, size, liquidity, growth, tangibility, NDTS, GDP, capital adequacy ratio, and inflation as core determinants that impact the capital structure of Shariah banks that are operating in dissimilar countries. Notably, this study introduces the capital adequacy ratio as a key factor that influences capital structure constructing practices of Shariah banks. The capital adequacy ratio (CAR) is used to measure banks' available capital in connection with their current liabilities and existing risk-weighted assets. In other words, CAR explains the banks' ability to settle their liabilities and its ability to handle credit and operational risks (Chen, 2024). The Shariah-tagged banks are not allowed to avail interest-based loans and do not offer interest on customers' deposits, thus, facing several types of risks and liquidity management-related issues. Therefore, CAR is selected to explore its impact on Shariah banks' capital structure. Besides, the leverage ratio is used to measure Shariah banks' capital structure. The linked hypotheses with this investigation are given below:

H_1: There is a negative association between Shariah banks' leverage and profitability.

H_2: There is a positive association between Shariah banks' leverage and assets tangibility.

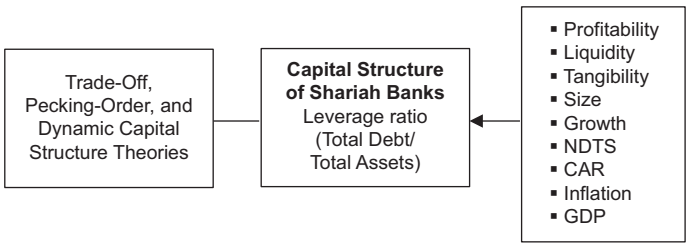
H_3: There is a positive association between Shariah banks' leverage and size.
H_4: There is a negative association between Shariah banks' leverage and growth.
H_5: There is a negative association between Shariah banks' leverage and liquidity.
H_6: There is an absence of any association between Shariah banks' leverage and NDTS.
H_7: There is a negative association between Shariah banks' leverage and CAR.
H_8: There is a positive association between Shariah banks' leverage and GDP.
H_9: There is a negative association between Shariah banks' leverage and inflation.
H_{10}: There is a dynamic association between Shariah banks' leverage and nominated determinants.

Figure 1 displays the constructed framework for Shariah banks' capital structure determinants. The Trade-off and Pecking Order theories and their updated dynamic versions are adopted to test Shariah banks' capital structure formulating practices. Moreover, the leverage ratio is picked as a proxy to measure Shariah banks' capital structure. Likewise, the traditional leverage-connected determinants that are profitability, liquidity, tangibility, size, growth, NDTS, inflation, capital adequacy ratio, and GDP are nominated to test as key significant determinants that impact capital structure preserving practices of Shairah-tagged banks.

3. DATA AND METHODOLOGY

This inquiry is an endeavor to identify the main capital structure determinants of Shariah-tagged banks. To perform the analysis, a total of 47 Shariah banks which are operational in twelve different countries: Indonesia, Bahrain, Egypt, Pakistan, Bangladesh, Malaysia, Kuwait, Turkey, Jordan, Saudi Arabia, Qatar, and the United Arab Emirates (Table 1) 9 years' i.e. from 2013 to 2021 Balance Panel Data is used. The nominated Shariah banks' data is mined from the Thomson Reuters Eikon and World Bank databases. The robust statistical software i.e. SAS is mobilized to perform the empirical analysis. Technically, a Balance Panel Data comprises a similar set of cross-sectional and time series observations of all selected individuals such as countries, banks, industries, firms, etc. (Abdul Hadi et al., 2018). Furthermore, considering the practices of former researchers in capital structure-connected inquiries (Rehan, 2022; Khan and Rehan, 2022) the Purposive sampling technique is adopted to develop a data set. Remarkably, purposive sampling allows investigators to design a data sample set by using their judgment (Galdeano et al., 2019; Rehan et al., 2019). Table 1 below demonstrates the number of banks selected from each country to perform the analysis.

Figure 1: Empirical and theoretical framework



Importantly, several Shariah banks are omitted from the sample because of the unavailability of their data for the nominated time period. Table 2 below clarifies the selected dependent and independent variables, their acronym, measurements, and former researchers' studies references who adopted the same variables for their data sample.

Table 2 depicts the chosen variables for this investigation. The leverage ratio is adopted to assess the designated Shariah banks' capital structure. Similarly, "LIQ" describes the liquidity position of Shariah banks, and "TANG" is selected to evaluate these banks' tangible assets. The Shariah banks' profitability is measured by evaluating two dissimilar financial ratios named return on equity i.e. stated as "ROE" and return on assets i.e. stated as "ROA." After that, the growth of Shariah banks is evaluated by a growth ratio i.e. written as "GRO." The non-debt tax shield is written as "NDTS" and the capital adequacy ratio is mentioned as "CAR." The size, inflation, and gross domestic product are selected determinants mentioned as SIZE, INF, and GDP respectively.

Methodically, both Panel Data tactics named Static and Dynamic models are accepted to determine the relationship among the designated determinants. Remarkably, numerous scholars indicate that leverage-maintaining practices of Shariah-tagged firms are dynamic (Ramli and Haron, 2017; Haron, 2016; Haron and Ibrahim, 2012) in nature. Therefore, this inquiry also accepts the Panel Data Dynamic investigation to explore the dynamic determinants and speed of adjustment for Shariah banks that are operating in dissimilar contexts. A robust dynamic estimator named the two-step Generalized Method of Moments (GMM) is used to perform the dynamic estimation and the speed of adjustment (SOA) for Shariah banks. The SOA explains that the capital structure diverges from its ideal level, however, in the occurrence of SOA, it speedily turns back to its optimal level. Exactly, the GMM evaluator is considered as the best to recognize the dynamic relatives and SOA among the selected dependent and explanatory determinants (Arellano and Bond, 1991). Fundamentally, the first-step version of GMM is created as a main evaluator, though, the two-step GMM holds extra features and can also estimate the adjustment speed i.e. SOA. Besides, it lessens the problem of endogeneity in the raised model which is present due to the substantial relation between chosen determinants and the model error term (Zandi et al., 2022). The elementary model for Panel Data Analysis is demonstrated in below given equation number 1.

$$y_{it} = \alpha_i + \gamma_t + \beta x_{it} + \varepsilon_{it} \quad (1)$$

In equation 1, "i" identifies individuals that are Shariah banks, and "t" clarifies the chosen time period for this investigation, "y_{it}" describes the selected variable of interest i.e. dependent determinant for this inquiry. Moreover, "α_i" indicates the cross-sectional functions of individuals, and "γ_t" are mentioned as properties of dissimilar time series during the designated time period. Likewise, "x_{it}" recognizes the selected explanatory factors. Similarly, "ε_{it}" recognizes the error term of the constructed model.

Table 2: Designated capital structure determinants for shariah banks

S#	Variables		Acronym	Measurement	References
1	Dependent variable	Leverage	LEV (Y)	Total Debt/Total Assets	Al Badarin and Ibrahim Abanda (2024); Al-Deehani et al. (1999)
2	Independent variables	Liquidity	LIQ (X_1)	Current Assets/Current Liabilities	Al Badarin and Ibrahim Abanda (2024); Bukair (2019)
3		Tangibility	TANG (X_2)	Tangible Fixed Assets/Total Assets	Al Badarin and Ibrahim Abanda (2024); Nandani et al. (2023)
4		Return-On- Assets	ROA (X_3)	Net Income/Total Assets	Tarek Al-Kayed et al. (2014); Nandani et al. (2023)
5		Return-On- Equity	ROE (X_4)	Net Income/Total Equity	Rehman (2023); Gozali et al. (2023); Tarek Al-Kayed et al. (2014)
6		Growth	GRO (X_5)	(Assets of present year-Assets of prior year)/ Assets of the prior year	Rehman (2023); Al Badarin and Ibrahim Abanda (2024)
7		Non-Debt Tax Shield	NDTS (X_6)	Annual depreciation of total assets	Khurshid and Irshad (2022); Bukair (2019)
8		Capital Adequacy Ratio	CAR (X_7)	Eligible Capital/Avg. Risk-Weighted Assets	Baldwin et al. (2019); Shah et al. (2014)
9	Control variable	Size	SIZE (X_8)	Ln (Total Assets)	Hoque and Liu (2022); Toumi (2023); Shah et al. (2014)
10	Macroeconomic variables	Inflation	INF (X_9)	Yearly Inflation Rate	Toumi (2023); Tarek Al-Kayed et al. (2014)
11		Gross Domestic Products	GDP (X_{10})	Yearly GDP Rate	Toumi (2023); Tarek Al-Kayed et al. (2014)

Y describes the nominated dependent, while X elucidates the nominated independent variables

Notably, this inquiry also adopted a GMM evaluator to perform analysis, thus, equation number 2 below clarifies the single-liner dynamic model for the two-step GMM.

$$y_{it} = (1-\lambda)\, y_{i,t-1} + \beta_1 k_{it} + \beta_2 X_{it} + \mu_{it} \quad (2)$$

$i = 1\ldots. 47,\ t = 1,2\ldots\ldots,9$

This empirical investigation has designated the Panel Data Static and Dynamic models that were previously executed by (Rehan et al., 2024; and Othman et al., 2023). The Equation 3, Equation 4 and Equation 5 below clarify the Panel Data POLS Static that are Fixed Effects (FE) and Random Effects (RE) models. Likewise, equation number 6 elucidates the Panel Data Dynamic model analysis.

1. Pool ordinary least squares (POLS) regression model

$$LEV_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta 2\ TANG_{it} + \beta 3\ ROA_{it} + \beta_4 ROE_{it} + \beta_5 GRO_{it} + \beta_6 NDTS + \beta_7 CAR_{it} + \beta_8 SIZE_{it} + \beta_9 INF_{it} + \beta_{10} GDP_{it} + \varepsilon_{it} \quad (3)$$

2. Panel data fixed effects (FE) regression model

$$LEV_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 TANG_{it} + \beta_3 ROA_{it} + \beta_4 ROE_{it} + \beta_5 GRO_{it} + \beta_6 NDTS + \beta_7 CAR_{it} + \beta_8 SIZE_{it} + \beta_9 INF_{it} + \beta_{10} GDP_{it} + \mu_{it} \quad (4)$$

3. Panel data random effects regression model (RE)

$$LEV_{it} = \beta_0 + \beta_1 LIQ_{it} + \beta_2 TANG_{it} + \beta_3 ROA_{it} + \beta_4 ROE_{it} + \beta_5 GRO_{it} + \beta_6 NDTS + \beta_7 CAR_{it} + \beta_8 SIZE_{it} + \beta_9 INF_{it} + \beta_{10} GDP_{it} + \varepsilon_{it} + \mu_{it} \quad (5)$$

4. Panel data dynamic regression model

$$LEV_{it} = (1-\lambda)\, LEV_{i,(t-1)} + \beta_1 LIQ_{it} + \beta_2 TANG_{it} + \beta_3 ROA_{it} + \beta_4 ROE_{it} + \beta_5 GRO_{it} + \beta_6 NDTS + \beta_7 CAR_{it} + \beta_8 SIZE_{it} + \beta_9 INF_{it} + \beta_{10} GDP_{it} + \varepsilon_{it} + \mu_{it} \quad (6)$$

The presented determinants in Equation 3, Equation 4, Equation 5, and Equation 6 are described in above given Table 1. Furthermore, the "ε_{it}" indicates an error term in the models, while, "μ_{it}" designates a random difference. Also, in equation number 6 the "(1- λ) $LEV_{i,(t-1)}$" indicates the legged determinants of a selected variable of interest i.e. leverage ratio.

Remarkably, the POLS model is measured as the best model, precisely, for those data sample sets that are homogeneous (Chakrabarti and Chakrabarti, 2019). Technically, the sample sets that share identical attributes such as age, country, gender, etc. are called homogeneous (Bornstein, Jager, and Putnick, 2013). In addition, this inquiry also implements several analytical tests to check the accuracy of the developed model. First, consistent with the former studies (Bawuah, 2024; Mokhova and Zinecker, 2014) this investigation also executes a Pearson Correlation matrix test which is implemented to find the link between the selected determinants. Technically, if the coefficient of the Pearson Correlation is observed at +1 then it explains a positive association, whereas, if it is observed at "−1" then a negative association is reported between the studied determinants. Similarly, the "0" value of the coefficient specifies the absence of any association between the studied determinants (Zou et al., 2003). Similarly, the Variance Inflation Factor (VIF) test is executed to find the problem of multicollinearity in the studied determinants.

The multicollinearity issue is noticed due to the precise correlation among the investigated variables of the developed model. The multicollinearity issue exists if the VIF analytical test result surpasses the number 10 (Gujarati and Porter, 2009). The statistical model of the VIF test is depicted in below presented equation number 7, equation number 8, and equation number 9.

$$R^2 Y \rightarrow Y_{it} = \alpha_0 + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + e_{it} \quad (7)$$

$$j = R_Y^2, R_{X1}^2, R_{X2,}^2 R_{X3,}^2 R_{X4,}^2 R_{X5}^2 \quad (8)$$

$$Tolrance = 1 - R_j^2 \quad VIF = \frac{1}{Tolerance} \tag{9}$$

Once the model accuracy is confirmed, the Panel Data Static is implemented. However, to check the exact model of the Panel Data Static analysis, the characteristics of each individual are analyzed by executing the Breusch-Pagan Lagrange-Multiplier (BPLM) test. The BPLM test confirms the most appropriate test between POLS and RE for analysis. Thus, if the RE test is confirmed then the Hausman (1978) test is performed to confirm the acceptance of the RE test.

Thus, the correct model between FE and RE is recognized by applying the Hausman (1978) test. The test of Hausman accepts the BPLM test m statistics to identify the exact hypothesis. The null hypothesis (H_0) of the Hausman test clarifies that the POLS is the best to execute the investigation. Nevertheless, the other hypothesis (H_1) specifies that the RE test is appropriate to perform the investigation. Remarkably, Hausman's test indicates the best estimator from RE and FE (Breusch and Pagan, 1980). Below equation number 10 clarifies the Hausman's test analytical model:

$$H = (b_1\text{-}b_0)\ (Var\ (b_0)\text{-}Var\ (b_1))\ (b_1\text{-}b_0) \tag{10}$$

Besides, this inquiry executed a dynamic investigation to explore the SOA and the presence of dynamic capital structure for the Shariah banks. Thus, the vigorous estimator that is GMM assessor is executed to perform the dynamic analysis. Furthermore, the analytic problems that are associated with the GMM analysis are diagnosed by the execution of Autocorrelation i.e. AR(m) and Sargan tests. Technically, the GMM-connected diagnostic test that is Sargan test is implemented to analyze the problem of exogeneity. Similarly, the "AR(m)" test is implemented to discover the selected determinants' dependence on their prior figures. Remarkably, the GMM evaluator eradicates autocorrelation and exogeneity problems (Arellano and Bond, 1991).

4. FINDINGS

Table 3 below displays the descriptive statistics of the all-selected explanatory variables and dependent variable. Notably, the descriptive statistics comprise the value of the mean, the standard deviation (Std. Dev), the minimum (min), and the maximum (max) figures.

Table 3: Statistical descriptions (2013-2021)

Variables	Obs.	Mean	SD*	Min	Max
LEV	423	0.484	0.3614	0.002	0.9880
LIQ	423	0.07913	0.1524	−0.01321	0.9513
TANG	423	0.986	0.0368	0.704	1.0110
ROA	423	0.040087	0.2022	−0.632	0.3160
ROE	423	0.0519	0.1027	0.7621	0.5390
GRO	423	0.094185	0.8524	−0.6921	11.7710
NDTS	423	0.0383	0.0143	−0.0037	0.0432
CAR	423	0.17922	0.0568	0.006354	0.2567
SIZE	423	0.5689	0.0921	0.6912	2.2320
INF	423	0.04411	0.0426	−0.04192	0.2814
GDP	423	0.06312	0.1392	−0.29562	0.4395

LEV: Leverage, LIQ: Liquidity; TANG: Tangibility, GRO: Growth, NDTS: Non-debt tax shield, CAR: Capital adequacy ratio, SIZE: Size, INF: Inflation, GDP: Gross domestic products

According to Table 3, the total number of observations is 423. Moreover, the obtained statistics elucidate that the mean of the Shairah banks' leverage is at 48% which describes that these banks' 48% assets are financed by both types of liabilities which are depositors' and non-depositors' liabilities. Likewise, the mean value for liquidity is found at 7.9%, which specifies that 7.9% of liquid assets are accessible to meet these banks' cash-basis short-term obligations. The 98% mean of tangibility mentions that these banks focused more on preserving assets' tangibility. Afterward, the mean values of ROA, ROE, GRO, and NDTS are registered at 4%, 5%, 9%, and 3% respectively. The positive ROA and ROE provide evidence that Shariah banks have solid earning potential. The high CAR mean value i.e.17% confirms that these banks have enough capital in hand to face any uncertain situation. Subsequently. The mean values of Size, INF, and GDP stand at 56%. 4% and at 6%. The next Table 4 displays the results obtained from the Pearson Correlation analysis.

The results displayed in Table 4 explain the absence of any solid association among the studied determinants for Shariah banks. The maximum correlation figure is 0.586 which is detected between the GDP and the leverage; thus, the outcomes confirm that there is no issue of multi-collinearity. Notably, the negative association of liquidity (LIQ), capital adequacy ratio (CAR), and non-debt tax shield (NDTS) is observed with Shariah banks' leverage. Likewise, the tangibility (TANG), growth (GRO), profitability (ROA and ROE), size (SIZE), inflation (INF), and gross domestic products (GDP) possess positive associations with investigated banks leverage (LEV). Next, this inquiry also performs the VIF analysis to check the existence of multi-collinearity issues.

The outcomes gained from VIF analysis are displayed in above Table 5 explains that all obtained figures are below the level of 10, thus, designating the absence of multi-collinearity among the investigated determinants. The next Tables 6 and 7 present the results gained from the BPLM and Hausman's tests.

The achieved "p" figure from the BPLM test in the above-presented Table 6 designates to accept the alternative hypothesis (H_1). Thus, the attained outcomes clarify that the R.E valuation is more appropriate than the Pool OLS. Next, to confirm the accuracy of the BPLM test, Hausman's test is implemented. Technically, the Hausman test is executed to accept the most appropriate Static model between F.E and R.E. The result accomplished from the Hausman test is presented in Table 7.

Evidently, the results expose that "P" statistics is bigger than the explained criteria ("P < 0.05"). This confirms the validity of the RE model. Thus, to expose key capital structure determinants of Shariah banks the random effects (RE) model is executed. The results attained from the RE model analysis are presented in Table 8.

The results attained from the execution of the Panel Data Static RE model explain that liquidity (LIQ), profitability (ROE), and gross

Table 4: Pearson correlation analysis

Variables	LEV	LIQ	TANG	ROA	ROE	GRO	NDTS	CAR	SIZE	INF	GDP
LEV	1	-	-	-	-	-	-	-	-	-	-
LIQ	−0.441	1	-	-	-	-	-	-	-	-	-
TANG	0.122	0.143	1	-	-	-	-	-	-	-	-
ROA	0.424	0.391	0.342	1	-	-	-	-	-	-	-
ROE	0.331	0.232	0.521	0.482	1	-	-	-	-	-	-
GRO	0.327	−0.388	−0.382	0.261	0.221	1	-	-	-	-	-
NDTS	−0.333	0.482	0.531	−0.342	0.317	0.110	1	-	-	-	-
CAR	−0.429	0.181	−0.221	0.161	0.118	0.061	0.122	1	-	-	-
SIZE	0.378	−0.293	0.422	0.511	0.461	0.339	0.473	0.341	1	-	-
INF	0.423	0.341	0.351	0.272	0.353	0.565	0.363	0.152	0.430	1	-
GDP	0.586	0.481	0.331	0.451	0.261	0.514	0.339	0.291	0.391	0.421	1

LEV: Leverage, LIQ: Liquidity; TANG: Tangibility, GRO: Growth, NDTS: Non-debt tax shield, CAR: Capital adequacy ratio, SIZE: Size, INF: Inflation, GDP: Gross domestic products

Table 5: VIF analysis

Variables	VIF	1/VIF
LIQ	2.833	0.353
TANG	4.251	0.235
ROA	6.221	0.161
ROE	4.153	0.241
GRO	2.152	0.465
NDTS	4.133	0.242
CAR	3.702	0.270
SIZE	2.811	0.356
INF	3.133	0.319
GDP	4.412	0.227

LEV: Leverage, LIQ: Liquidity; TANG: Tangibility, GRO: Growth, NDTS: Non-debt tax shield, CAR: Capital adequacy ratio, SIZE: Size, INF: Inflation, GDP: Gross domestic products

Table 6: BPLM (Two-Way) test analysis

H_0: Pooled OLS is a fitted model
H_1: RE is a fitted model

"Shariah Banks m-Value"	"P >m"
9313	0.0001*

Table 7: Hausman's test outcomes

H_0: RE is a fitted model
H_1: FE is a fitted model

"m-value"	5.24
Pr >m	0.4181

domestic product (GDP) are key positive significant, whereas, capital adequacy ratio (CAR), is negative significant leverage-connected determinant for Shariah banks. Besides, tangibility (TAN), return on assets (ROA), growth (GRO), non-debt tax shield (NDTS), size (SIZE) and inflation are observed insignificant for Shariah banks. The next Table 8 and Table 9 explain the analytical test implemented to check the accuracy of the GMM models.

The results gained from the execution of the Sargan test presented in Table 9 and suggest the presence of an exogeneity problem in the studied instruments, thus, the null hypothesis (H_0=The nominated Instruments are effective) is recognized. Next, Table 10 displays the outcomes attained from the implementation of autocorrelation i.e. AR(m) assessment.

The results presented in Table 10 specify that the constructed dynamic model is free from the issue of Autocorrelation. Hence, the null hypothesis (H_0: Autocorrelation issue does not exist) is

Table 8: Random effects assessment for Shariah banks determinants

Wallace-Hussain: Two-Way Random effects (R.E)				
Variables	**Estimate**	**Standard Error**	**t Value**	**Pr > |t|**
Intercept	0.1862	0.0673	2.7667	0.0057
LIQ	0.2913	0.0651	4.4747	0.0001**
TANG	0.0139	0.1021	0.1361	0.8917
ROA	−0.0122	0.139	0.0878	0.9313
ROE	0.1215	0.0312	3.8942	0.0001**
GRO	0.1513	0.153	0.9889	0.3227
NDTS	−2.231	1.476	1.5115	0.1307
CAR	−0.0673	0.0142	−4.7394	0.0001**
SIZE	0.0141	0.136	0.1037	0.9174
INF	0.0631	0.146	0.4322	0.6652
GDP	0.0521	0.0214	2.4346	0.0149**
R-square				0.5437

***, **, *are significant levels at 1%, 5%, and 10%. LEV: Leverage, LIQ: Liquidity; TANG: Tangibility, GRO: Growth, NDTS: Non-debt tax shield, CAR: Capital adequacy ratio, SIZE: Size, INF: Inflation, GDP: Gross domestic products

Table 9: Sargan diagnostic test for GMM analysis

H_0: The nominated Instruments are effective
H_1: The nominated Instruments are not effective

Statistics	"Prob" > Chi-square
32.04	0.1913

Table 10: Autocorrelation (AR[m]) for GMM analysis

H_0: Autocorrelation issue does not exist
H_1: Autocorrelation has existed

Lag	Statistics	Prob >Chi-square
1	−3.18	0.998

accepted. After confirming the model accuracy, the next Table 11 presents the results obtained from the execution of the GMM estimator.

Interestingly, the GMM analysis stipulates that lagged variable of leverage (Lev_1), liquidity (LIQ), tangibility (TANQ), and profitability (ROE), are the positive significant determinants, whereas, growth (GRO) and capital adequacy ratio (CAR) are observed as a negative significant determinant of capital structure for the Shariah banks. Nevertheless, another profitability measure determinant (ROA), non-debt tax shield (NDTS), size (SIZE), inflation (INF), and gross domestic product (GDP) are found insignificant determinants via GMM analysis for Shariah banks.

Table 11: GMM Analysis for dynamic determinants of SARRC Banks

GMM: First differences transformation				
Estimation method: Two-Step GMM				
Parameter estimates of Lev model for Shariah Banks				
Variables	Lev model (Lagged dependent variable=Lev_1)			
	Estimate	Standard error	t value	Pr > |t|
Intercept	0.0166	0.2972	0.0559	0.9554
Lev_1	0.2633	0.0673	3.9118	0.0001**
LIQ	0.3261	0.0724	4.5041	0.0001**
TANG	0.0632	0.0211	2.9967	0.0027**
ROA	0.2933	0.2422	1.2109	0.2259
ROE	0.1613	0.0356	4.5309	0.0001**
GRO	−0.2635	0.0414	6.3647	0.0001**
NDTS	0.3622	0.2531	1.4311	0.1523
CAR	−0.0642	0.0233	−2.7554	0.0059**
SIZE	0.6210	0.4290	1.4476	0.1477
INF	−0.4690	0.3163	1.4828	0.1389
GDP	0.6147	0.2813	2.1852	0.0289

***, **, *are significant levels at 1%, 5%, and 10%. LEV: Leverage, LIQ: Liquidity; TANG: Tangibility, GRO: Growth, NDTS: Non-debt tax shield, CAR: Capital adequacy ratio, SIZE: Size, INF: Inflation, GDP: Gross domestic products

Technically, the significant lagged variable confirms the presence of dynamic leverage and adjustment speed (SOA). The coefficient value of the lagged determinant owns a number of 0.2633. This illustrates that if the capital structure of Shariah banks deviates from its optimum level, then its approximate adjustment speed (SOA) toward the targeted level is 73% (1-0.2633 = 0.7367). Hence, this demonstrates that the Shariah banks return toward their equilibrium or optimum position of capital structure in almost 1 year and 3 months (100 ÷ 73 = 1.3698). The positive significant tangibility, lagged variable, liquidity and presence of SOA confirm that Dynamic Trade-Off theory is more suitable to explain capital structure preserving practices of the Shariah banks.

5. DISCUSSION

The capital structure determinants of Shariah-tagged banks are still required to be identified. Thus, this empirical inquiry is conducted to explore the capital structure determinants for Shariah banks which are operational in 47 dissimilar countries (Table 1) during the period of 9 years from 2013 to 2021. The Panel Data Static and Dynamic estimators are executed to perform the analysis. The outcomes obtained from the Static model explain that liquidity, profitability, capital adequacy ratio, and gross domestic products are the key determinants that impact the leverage-preserving practices of the Shariah banks. Similarly, the GMM investigation on the dynamic model illustrates that lagged leverage determinants, liquidity, tangibility, profitability, growth, and capital adequacy ratio are the important determinants that hold a significant impact on the capital structure of Shariah banks. Interestingly, both estimators confirm that liquidity, profitability, and capital adequacy ratio are important leverage-connected determinants for Shariah banks. However, it is important to note that the growth and capital adequacy ratio possesses negative significance, while other significant determinants exhibit positive associations with Shariah banks' leverage.

The Shariah-tagged firms are considered tangible firms and rely more on internally available funds; thus, their focus is more on maintaining liquidity (Thabet and Hanefah, 2014). Typically, Shariah banks are those that are not involved in interest-based activities and invest their depositor's funds in dissimilar schemes to earn a profit. On the flip side, interest-based business is a core activity of conventional banks. Therefore, in comparison with conventional banks, Shariah banks receive fewer deposits from their customers. Hence, their focus is more on maintaining liquidity. The significant liquidity ratio points out that these banks effectively maintain liquidity. Likewise, the significant tangibility, growth, and profitability confirm that these banks invest depositors' funds in real assets and schemes to generate profit which enhances these banks' financial growth i.e. profitability. The results are consistent with the findings of Al Badarin and Ibrahim Abanda (2024) who confirmed significant relationships between Shariah banks' leverage and profitability, liquidity, and tangibility. The same goes for Al-Hunnayan (2020) and Shah et al. (2014) who reveal the significant association of Shariah banks' leverage with tangibility, liquidity, and growth. Interestingly, both estimators specify the negative but significant association of capital adequacy ratio (CAR) with Shariah banks' leverage. The CAR ratio specifies the banks' ability and efficiency to handle its obligations and various risks such as credit and operational risk. Typically, holding extra capital is connected with a considerable cost for banks, thus, banks try to maintain less cash than the imposed restrictions by local central banks (Mishkin, 2000). Also, the Shariah banks are not involved in interest-based long-term financing and are focused more on availing short-term obligations. Therefore, they need to settle their obligation in a short time period which also creates liquidity shortage problems for them. Technically, the banks that hold risky assets also hold higher capital (Grais and Kulathunga, 2006), however, Shariah banks are measured as less risky. The significant but negative association of CAR with Shariah banks' leverage designates these banks are holding less cash. The results for CAR are in line with the findings of Gazi et al. (2024) and Shah et al. (2014) who explain the negative but significant association of CAR with Shariah banks' leverage. Moreover, the significant and positive-lagged dependent variable specifies the existence of adjustment speed i.e. SOA. This confirms that Shariah banks' leverage is dynamic in nature and in case of any deviation returns to its optimum position in a certain time period. The significant tangibility, liquidity, and lagged dependent variable explain that the Dynamic Trade-off theory is more dominant in explaining the capital structure constructing practices of Shariah banks. Overall, the outcomes attained from the analysis strongly support the acceptance of Hypothesis 2 for asset tangibility, Hypothesis 4 for growth, Hypothesis 5 for liquidity, Hypothesis 7 for CAR, and Hypothesis 10 for the existence of dynamic capital structure.

6. CONCLUSION

This empirical inquiry is set to identify the core capital structure determinants of Shariah banks. For that purpose, a total of 47 Shariah banks' 9 years (2013-2021) Balanced Panel Data is used. The results designate positive and significant associations between liquidity, gross domestic product, tangibility, lagged dependent variable, and return on equity, while, growth and capital adequacy ratio are observed as negative significant determinants of capital structure for Shariah banks. The significant lagged

variable confirms the existence of adjustment speed i.e. SOA for Shariah banks. This demonstrates that in case of any deviation from the optimal level, these banks return toward their targeted capital structure in 1 year and 3 months. The significant role of tangibility, liquidity, and the existence of SOA confirm that the Dynamic Trade-off theory is the best to explain capital structure preserving practices of Shariah banks. The results are beneficial for the policymakers, and Shariah regulatory bodies as it can help them develop similar policies for formulating the capital structure of whole Shariah banks that are operating in dissimilar countries.

This study is limited to Shariah banks; however, future researchers should consider other non-banking financial institutions in their inquiries. Likewise, some other determinants that are interest rate, zakat, credit risk, and operation risk are required to be incorporated into the empirical framework. Also, this study eliminates several Shariah banks because of data inaccessibility, thus, more Shariah banks are required to be added to the existing sample set and statistical models to attain more accurate outcomes.

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