




## Are shariah and non-shariah firms' capital structure determinants and financial performance related? Evidence from Malaysia



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### ABSTRACT

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This comparative analysis is an attempt to explore the core differences among the capital structure determinants of Malaysian Shariah and non-Shariah firms. Besides, this investigation also explores which financial category in Malaysia, either Shariah or non-Shariah, maintained its performance, i.e., earnings; during the peak period of the COVID-19 pandemic and to what extent their performance is related. For analysis purposes, this investigation used 454 firms' 17 years' financial data, i.e., 2005-2021. The Panel Data Static models are executed to perform the empirical investigation. The debt-to-equity ratio is selected as a dependent variable, whereas total assets, sales, current assets, growth, return on equity, non-debt tax shield, and earnings per share are nominated as independent variables. The results indicate that fixed assets and growth are core determinants for both types of firms. This endorses the validity of these two investigated determinants for the whole Malaysian firm. Moreover, current assets, non-debt tax shield, fixed assets, growth, and earnings per share are also observed as main and significant determinants for Shariah-tagged firms. The positive significance of tangibility, non-debt tax shield, and liquidity explain why the Trade-off theory is more dominant in the Malaysian context. Besides, the outcomes obtained from descriptive statistics and Independent Two-sample t Test explain that both financial categories of Malaysian listed firms maintained negative earnings during the COVID-19 peak period, i.e., 2020. The results will help policymakers devise the best financing model i.e., Shariah and non-Shariah, specifically during the uncertain financial fiascos.

**Contribution/Originality:** After the sector reclassification of Bursa Malaysia in September 2018, this comparative analysis is the first to examine the dissimilarities among the capital structure determinants of the choices of Malaysian Shariah and non-Shariah firms at the sector level. Also, it explores the performance of Malaysian Shariah and non-Shariah firms' categories during the peak of the pandemic.

## 1. INTRODUCTION

Despite several decades of research, capital structure is still considered an unsettled issue in the corporate finance world (Ghani, Hye, Rehan, & Salahuddin, 2023; Saif-Alyousfi, Md-Rus, Taufil-Mohd, Taib, & Shahar, 2020). Evidently, no one-size-fits-all formula exists that helps firms achieve an optimal level of capital structure. The capital structure mentions the technique a firm adopts to finance its growth and operations through the best grouping of debt, retained earnings, equity, and other various available financial resources (Akbar, Khan, Haq, &

Khan, 2023). Likewise, the optimal capital structure is the one that maximizes the inclusive value of the firm while minimizing its cost of acquiring capital (Huong, 2023; Jaworski & Czerwonka, 2021). Technically, an optimal capital structure relies on numerous determinants that help a firm develop the best financing mix of debt and equity. A well-optimized capital structure is one that guarantees a firm efficient financing and risk mitigation for its ongoing operation (Goldstein & Yang, 2023). Moreover, it also moves the firm toward its key aim of financial performance, i.e., profitability. Therefore, handling a firm's financing-connected matters to attain an optimum level of capital structure is always desirable (Harris & Roark, 2019). Thus, selecting appropriate determinants for attaining an optimum level is a tough task for financial concerns. The fundamental capital structure theories provide guidelines for the firms to adopt those determinants, which help them construct a suitable mix of debt and equity (Frank & Goyal, 2008). Even though there are numerous pieces of research available on the topic of exploring capital structure formulating determinants, very little work has been presented on inspecting capital structure determinants for Shariah-tagged firms.

Typically, Shariah firms are those that function in obedience to the principles of Islamic laws and regulations and are not involved in any sort of activity that is forbidden in Islam, like gambling, interest, alcohol, etc (Kamal, Arshad, Che-Yahya, & Alyasa-Gan, 2023). Notably, debt is often connected with interest. Therefore, Shariah firms are bound by various regulatory bodies not to cross the explained threshold for availing debt. For instance, standard 21 of the Accounting and Audit Organization for Islamic Financial Institutions (AAOIFI) explains that Shariah institutions are allowed to avail of debt financing, but it must not be more than 30% of their total announced capital (Thabet, Shawtari, Ayedh, & Ali, 2017). Clearly, Shariah firms have limited choices for maintaining capital structures. In contrast, non-Shariah-compliant enterprises are characterized as firms burdened with debt and are afforded the freedom to keep their financial structure without restrictions. Thus, due to numerous restrictions on interest-based debt, constructing the best blend of capital structures is a tough decision for these firms. Hence, it is presumed that the capital structure framing determinants for both dissimilar types of firms are not similar. In view of various restrictions that are imposed on Shariah-tagged firms, several Muslim countries have two dissimilar financial systems that are operating simultaneously (Hernawati, Hadi, Aspiranti, & Rehan, 2021). Similarly, Malaysia operates two parallel but dissimilar financial systems, which are Shariah and non-Shariah. Malaysia is widely recognized as a prominent participant in the global Islamic finance sector, owing to its diverse financial system. However, for Malaysian Shariah-tagged firms, it is strictly warranted to obey Islamic rules and all those standards that are fixed for them by the Shariah Advisory Council (SAC) (Ahmad & Azhar, 2015). In Malaysia, the SAC is a regulatory body that has a responsibility to ensure and check that all Shariah-tagged firms are strictly following Islamic principles and regulations (Hussain, Shamsudin, Anwar, Salem, & Jabarullah, 2018; Othman, Thani, & Ghani, 2009). Remarkably, more than 80% of the Malaysian market fragment is covered by Shariah-tagged firms. Hence, it is required to investigate whether Shariah-tagged and other operating Malaysian firms' capital structure determinants are dissimilar.

Notably, Shariah-tagged firms are measured as tangible firms that are not involved in interest-connected long-term financing, concentrate more on managing liquidity, and are also able to handle divergent economic regimes and foreseen risk. Also, many Islamic researchers have faith that Shariah-following financial systems are safe and able to handle all sorts of financial shocks (see (Abdul Hadi, Rehan, Zainudin, & Hussain, 2018; Elasrag, 2017; Hassan & Kayed, 2018)). On the other hand, several scholars also believe that the restriction imposed on Shariah-tagged firms, specifically on availing of interest-based debt finance, could be a reason for the slow economic growth of Islamic countries (Mossaad, 2005). In view of this debate, the recent pandemic of Covid-19, which has shaken the global financial markets, has raised a new question for scholars: which financial category is able to handle financial shocks in all different regimes? Visibly, it is observed that the Malaysian market, whose major fragment is covered by Shariah firms, is badly affected by the last financial fiascos (Abdul Hadi & Rehan, 2019). Likewise, the recent pandemic of Covid-19 also severely affected the Malaysian financial markets (Lee, Jais, & Chan, 2020; Yong, Ziaei,

& Szulczyk, 2021). Interestingly, Malaysia operates both financial categories simultaneously, i.e., Shariah and non-Shariah. Thus, the Malaysian market is considered the best test pad to test financial performance between both systems. The former inquiries, which relatively measured the financial performance of Malaysian Shariah and non-Shariah categories during the COVID-19 pandemic, are still nominal.

In view of this, it is required to explore which financial category in Malaysia, either Shariah or non-Shariah, delivered the best financial performance during the pandemic. Besides, it is also warranted to explore to what extent the financial performance of these two dissimilar financial categories is related.

Considering the above discussion, it is warranted to check at what level the capital structure formulating determinants of these two dissimilar types of Malaysian firms are different. Likewise, the recent pandemic Covid-19 provided the best test pad to discover which financial category; either Shariah or non-Shariah in Malaysia delivered the best financial performance during the peak period of the pandemic. The findings will assist policymakers in developing an improved financing framework that offers comprehensive assistance to Malaysian enterprises, regardless of their adherence to Shariah principles, in order to sustain an optimal combination of accessible financial means. Also, this inquiry contributes to the empirical literature and offers evidence that will aid policymakers in constructing the best financing model for both types of financial categories, specifically during times of crisis and economic downturns.

After section number 1, i.e., introduction, the next section 2 explains a thorough review of the available literature on the topic. After that, section number 3 describes the extracted data type and the selected methodology to execute the empirical analysis. Then, the next section, number 4, discusses and explains the observed results. Lastly, section 5, which is the conclusion, describes an entire summary of the whole inquiry and its results with recommendations for other researchers.

## 2. LITERATURE REVIEW

Capital structure theories help firms adopt appropriate groupings of debt, retained earnings, equity, and other available financial resources to meet financial obligations. Also, several researchers have explained the theoretical connection between capital structure and its key elements, which impact a firm's total value and its cost of capital (see (Durand, 1959; Ghani et al., 2023; Myers & Majluf, 1984)). Similarly, capital structure theories develop a proposed platform for empirical investigations where abundant determinants are first tested to formulate an optimum mix of debt and equity (Saif-Alyousfi et al., 2020). Visibly, in the last few decades, some conventional theories of capital structure, such as Modigliani & Miller (MM), Pecking Order, and trade-off theories, have helped firms adopt those suitable determinants that build the best optimal capital structure. Modigliani and Miller (1958) introduced their first proposition that explains the concept of an ideal capital market. According to them, the value of a leveraged firm is equal to that of other unleveraged firms in the ideal market. Typically, a market where no taxation cost, no cost of a transaction, no agency cost, and no bankruptcy cost are present and asymmetry information exists for all users is known as an ideal market. Later, they presented their amended proposition number II, which explains that an organization's overall value is not affected by its dividend policy.

After that, the trade-off theory was presented, which concentrates on the idea of an ideal capital structure. According to this theory, firms must choose the appropriate balance of equity and debt to manage financial costs like interest on debt and capital gains. Later, the Pecking Order theory, which is also known as a major rival to the trade-off theory, proposes that a firm pays its debts and invests in projects by first using retained earnings, then going to debt, and then picking equity as a last and absolute choice (Abdul Hadi et al., 2018; Hye, 2022). There are numerous observed investigations on the topic of capital structure and its determinants. Technically, the three diverse theories that are MM, trade-off, and Pecking Order serve as the foundation for determining the significant determinants that influence the debt-equity choices of firms to construct an ideal capital structure. Nevertheless, few researchers have investigated the application of these theories to Shariah-tagged firms. Evidently, numerous

researchers have performed a comparative analysis and specified that capital structure theories helped both Shariah-tagged and other firms pick those key determinants that create the best blend of debt and equity. For instance, Hassan, Shafi, and Mohamed (2012) detected the existence of trade-off theory and Pecking order theory in Malaysian Shariah and non-Shariah firms. Similarly, Sukor, Halim, and Bacha (2018) clarified the presence of Pecking order, Market timing, and Trade-off theories. Likewise, Akinsomi, Ong, Ibrahim, and Newell (2015) and Alnori and Alqahtani (2019) described the practice of Trade off and Pecking Order theories in Saudi Arabian Shariah and non-Shariah organizations. In contrast to these studies, Katper, Madun, and Katper (2021) reported no evidence for the applicability of any capital structure theory in the Pakistani market. Remarkably, this investigation also implemented a comparative tactic and emphasized inspecting capital structure determinants for Malaysian Shariah-tagged and non-Shariah firms. The earlier inquiries that discovered capital structure determinants for Malaysian listed firms clarified that assets tangibility, profitability, growth, sales, and liquidity are main determinants that construct Malaysian firms' capital structure (see (Fraser, Zhang, & Derashid, 2006; Ibrahim & Lau, 2019; Pandey, 2002; Salim & Yadav, 2012; Sutanto & Hariadi, 2023; Ting & Lean, 2011; Yau, Lau, & Liwa, 2008; Zainudin, Ibrahim, Hussain, & Hadi, 2017)).

Pandey (2002) provides a conclusion by exploring the linkage among leverage, i.e., capital structure, profitability, and firms' market structure. This inquiry examines 208 Malaysian firms from 1984 to 1999. The generalized method of moments (GMM) estimator is employed to analyze the Panel Data model. The results present a saucer-shaped association between firms' leverage and profitability. Moreover, size, risk, growth, and tangibility are found to be significant for the firms' capital structure. Similarly, Zainudin et al. (2017) explore the association between debt and Malaysian REIT firms' financial performance. This inquiry considers all real-estate investment trust (REIT) sector firms that were listed during the period of 2005 to 2014. The outcomes indicate a positive connection between size, tangibility, and capital structure. The parallel outcomes are indicated by Yau et al. (2008) and Fraser et al. (2006), who found a significant connection between asset tangibility and size and investigated firms' capital structures.

Also, Salim and Yadav (2012) explore the capital structure and profitability of listed Malaysian firms. This inquiry used the data of 237 listed firms. The outcomes specify that profitability-related explanatory variables, namely earnings per share, return on assets, and return on equity, have a significant relationship with firms' capital structures. Moreover, Ting and Lean (2011) and Suhaila and Mahmood (2008) considered growth as an important determinant of capital structure for Malaysian listed firms. The investigation performed by Suhaila and Mahmood (2008) reported a significant relationship between size, growth, liquidity, and interest ratio with firms' capital structures. However, Ting and Lean (2011) specify growth as an insignificant determinant of firms' capital structure. In the same vein, Ibrahim and Lau (2019) investigate leverage-related determinants for Malaysian firms. The outcomes confirm that liquidity and profitability have an important relationship with Malaysian firms' capital structures. Most recently, Sutanto and Hariadi (2023) examined the relationship between capital structure, profitability, and dividend policy on Malaysian, Indonesian, and Singaporean firms' overall value. The findings indicate that profitability has a significant impact on the debt-equity of these countries' firms.

Likewise, Abdul Hadi et al. (2018) inspect the debt-equity determinants for Shariah-tagged and other conventional firms that are listed on Bursa Malaysia. This inquiry adopts a 12-year dynamic panel data model and uses GMM to determine the dissimilarities among the capital structure determinants of Shariah-tagged and other firms. The outcomes explain that the debt-equity-connected decisions of both dissimilar types of Malaysian firms are not parallel. For Shariah-tagged firms, liquidity is the main and most significant determinant, whereas for non-Shariah firms, tangibility is a significant determinant. Also, Chow (2019) examines the sectorial-specific determinants of Malaysian firms. The findings specify that tangibility, growth, firms' profitability, and size are the main factors for Malaysian firms listed in dissimilar sectors. The findings of Abdul Hadi et al. (2018) and Chow (2019) confirm the reported outcomes of Hassan et al. (2012), who investigated the capital structure factors for

Shariah-tagged and other Malaysian firms. This inquiry employs yearly data from 2005 to 2010 of 120 firms, comprising 70 Shariah-tagged and 50 other firms. The findings specify that firms' profitability, tangibility, and size are the main determinants of Shariah-tagged firms, whereas size, firms' profitability, and non-debt tax shield (NDTS) are important determinants of non-Shariah firms.

The above-discussed inquiries (see (Abdul Hadi et al., 2018; Chow, 2019; Fraser et al., 2006; Hassan et al., 2012; Ibrahim & Lau, 2019; Pandey, 2002; Salim & Yadav, 2012; Suhaila & Mahmood, 2008; Sutanto & Hariadi, 2023; Ting & Lean, 2011; Yau et al., 2008; Zainudin et al., 2017)) indicate that profitability, firms' size, growth, asset tangibility, and NDTS are the core determinants of capital structure for Malaysian Shariah-tagged and non-Shariah firms. However, empirical inquiries that investigate the differences among these determinants are rare, outdated, and do not provide a holistic view of the market.

Remarkably, numerous inquiries provided evidence that the earnings of Shariah-tagged firms are stable and that these firms are able to handle all types of financial fiascos (see (Abdul Hadi & Rehan, 2019; Elasmag, 2017; Hassan & Kayed, 2018)). On the other hand, Ahmad and Ibrahim (2002) examine the Shariah indexes' earnings over the time period starting from 1999 to 2002 and indicate that generally, Shariah-tagged firms do not outperform in the market, and there is not very much difference in Shariah and non-Shariah firms' financial performance. Later, the outcomes of Ahmad and Ibrahim (2002) are confirmed by Farooq and AbdelBari (2015), who explore the earning management practices of Shariah and Non-Shariah categorized firms in the MENA region during the period of 2005 to 2009 and conclude that Shariah-categorized firms are more involved in low-income management than their counterparts i.e., non-Shariah. Likewise, Hambali and Adhariani (2023) investigate the sustainable performance of Indonesian and Malaysian Shariah firms during the peak period of the Covid-19 pandemic. The conclusions indicate that, in comparison with other eras, Shariah-tagged firms' performance was low during the Covid-19 pandemic.

The former studies (see (Ahmad & Ibrahim, 2002; Elasmag, 2017; Farooq & AbdelBari, 2015; Hambali & Adhariani, 2023; Hassan & Kayed, 2018)) offered contradictory findings for Shariah and non-Shariah firms' performance, specifically, during the different economic circumstances. Hence, it is imperative to assess the performance of both Shariah and non-Shariah-compliant financial categories in terms of their returns, specifically profitability, in times of financial downturn. Remarkably, the Malaysian capital market, which comprises Shariah and non-Shariah financial categories, is severely affected by the COVID-19 pandemic. The Bank Negara informed us that Malaysian economic growth was affected in the first quarter (Q1) of 2020. Also, the World Bank enlightened that before the pandemic outbreak, the GDP growth rate of Malaysia's economy was at 4.5%, which was later affected badly and plunged to -0.1% in 2020 (Chia, Liew, & Rowland, 2020). Thus, this inquiry also investigates which financial category of the Malaysian market, either Shariah or non-Shariah, provides the best financial performance, i.e., earnings during the COVID-19, and to what extent the financial performance of these two dissimilar financial categories is related.

### 3. DATA & METHODOLOGY

In order to perform the analysis, 17 years of Balance Panel data, i.e., 2005-2021 of 454 publicly listed Malaysian firms were mined from the Bloomberg database. The secondary data sample set is further categorized into 343 Shariah and 111 non-Shariah firms. Technically, Panel Data is a grouping of two different kinds of data sets: time series and cross-sectional. Furthermore, in Balance Panel Data, all observations are balanced in the different time intervals of the designated time period and have parallel observations (Gujarati, 2003). Remarkably, for the construction of 343 Shariah-tagged firms' data sample set model, this inquiry follows the standard set by the earlier scholars' (see (Haron & Ibrahim, 2012; Hassan & Kayed, 2018; Yildirim, Masih, & Bacha, 2018)) for capital structure-related Shariah-tagged firms' studies and adopts only those registered firms that are regularly marked as Shariah throughout the three successive periods.



The 454 firms' sample set is formed by adopting purposeful sampling tactics. Typically, in the Purposive Sampling method, researchers rely on their own judgments and decisions for deciding the targeted population (Mubeen, Hye, Shahid, & Rehan, 2022). Also, this inquiry omitted all those firms whose designated time period data is not accessible. Likewise, firms in the finance sector are also excluded as they are bound by central banks to preserve their capital reserves, which affects their debt equity selection decisions (Ariff, Taufiq, & Shamsher, 2008). In addition, this study also focuses on exploring the financial performance, i.e., earnings, of Malaysian Shariah and non-Shariah categories during the COVID-19 pandemic. For this purpose, following the practices of earlier researchers (see (Abdul-Rahim & Che-Embi, 2013; Ibrahim, Khong, Abdullah, & Amir, 2019; Yong & Isa, 2003)), profitability measure variables, i.e., EPS and ROE, are split into Shariah and non-Shariah subgroups. Notably, the data is mined for the nominated capital structure determinants that are defined in Table 1.

Table 1. Measurement of variables.

S#	Variables	Symbol	Measurement	References
01	Debt equity ratio	D/E (Y)	Total debt / Total shareholders' equity	Sutanto and Hariadi (2023); Pathak and Chandani (2023) and Basit and Hassan (2017)
02	Current assets	CA(X <sub>1</sub> )	Current assets of the selected firms	Abdul Hadi et al. (2018) and Abdul Hadi and Rehan (2019)
03	Non debt tax shield	NDTS (X <sub>2</sub> )	Depreciation / Total assets	Hassan et al. (2012) and Salim and Yadav (2012)
04	Fixed assets	FA (X <sub>3</sub> )	Fixed assets of the selected firms	Abdul Hadi et al. (2018) and Abdul Hadi and Rehan (2019)
05	Growth	GROW (X <sub>4</sub> )	% change in the selected firms' Total Assets	Chow (2019); Nejad and Wasiuzzaman (2013) and Salim and Yadav (2012)
06	Sales	SIZE (X <sub>5</sub> )	Total yearly sales of the selected firms	Abdul Hadi et al. (2018); Zabri (2012) and Baharuddin, Khamis, Mahmood, and Dollah (2011)
07	Earnings per share	EPS (X <sub>6</sub> )	Net income of the firms / Numbers of average shares outstanding	Basit and Hassan (2017); AlAli (2017) and Tan and Hamid (2016)
08	Return-on-equity	ROE (X <sub>7</sub> )	Net income (Yearly) / Avg. total equity	Zandi, Rehan, Hye, and Choo (2023); Kabakci (2008) and Demirhan (2009)

Table 1 explains the nominated determinants for this empirical inquiry. The debt-to-equity ratio, which itemized as D/E, is used to measure firms' capital structure. Similarly, CA designates assets' liquidity, and NDTS is used to measure non-debt tax shields. The asset tangibility is mentioned by FA, the growth of firms is indicated by Grow, and size is mentioned by the total yearly sales of the selected firms. Moreover, earnings per share and return on assets, i.e., mentioned by EPS and ROE, are used to measure the profitability of selected firms. Evidently, the nominated variables for this empirical inquiry are largely supported by the previously discussed literature.

Systematically, the Panel Data tactic is used to realize the relationships between the chosen dependent and independent variables. The elevated model of Panel Data is examined using the Panel Data Static method. Analytically, the Panel Data Basic Model is explained in Equation 1.

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

Here, 'i' indicates individual, 't' shows the selected time period,  $y_{it}$  describes the selected explanatory determinants,  $\alpha_i$  describes cross-sectional properties and  $\gamma_t$  are properties of different time series during the selected time period. Similarly,  $x_{it}$  indicates the selected independent variable and  $\varepsilon_{it}$  indicates the error term of the models.

This empirical inquiry has chosen the Panel Data Static model that was previously executed by Rehan, Abdul Hadi, Hussain, and Hye (2023); Zandi, Rehan, Hye, Mubeen, and Abbas (2022); and Chakrabarti and Chakrabarti (2019). Notably, the constructed models of this inquiry are different from the former studies' models as they adopt dissimilar determinants. For instance, as per the authors' knowledge, rare studies considered NDTS and growth as

debt equity determinants for Malaysian firms. The constructed models to investigate capital structure determinants for whole Malaysian firms are as given below in Equations 2, 3, and 4.

1. POLS Model

$$D/E_{it} = \beta_0 + \beta_1 CA_{it} + \beta_2 NDTS_{it} + \beta_3 FA_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 EPS + \beta_7 ROE_{it} + \beta_8 \varepsilon_{it}(2)$$

2. Panel Data Fixed Effects (FE) Model

$$D/E_{it} = \beta_0 + \beta_1 CA_{it} + \beta_2 NDTS_{it} + \beta_3 FA_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 EPS + \beta_7 ROE_{it} + \mu_{it}(3)$$

3. Panel Data Random Effects Model (RE)

$$D/E_{it} = \beta_0 + \beta_1 CA_{it} + \beta_2 NDTS_{it} + \beta_3 FA_{it} + \beta_4 GROW_{it} + \beta_5 SIZE_{it} + \beta_6 EPS + \beta_7 ROE_{it} + \varepsilon_{it} + \mu_{it}(4)$$

Here, a dependent variable, which is a debt-to-equity ratio, is indicated by 'D/E'. Moreover, CA, NDTS, FA, GROW, SIZE, and EPS designate all the selected explanatory variables. Remarkably, all the nominated variables are explained with their details in the above-given Table 1. Similarly, ' $\varepsilon_{it}$ ' specifies an error term and ' $\mu_{it}$ ' is a random difference of a raised model. Technically, the Pool Ordinary Least Squares (POLS) is measured as the best model for a sample that is homogeneous (Chakrabarti & Chakrabarti, 2019). The individual effects are analyzed by the Breusch-Pagan Lagrange-Multiplier test (BPLM). Similarly, the Fixed and Random Effects (RE and FE) features are identified by executing the Hausman (1978) test. Typically, the  $m$  statistics of Hausman's test are used by the BPLM test to select the right hypothesis. The Hausman's test null hypothesis ( $H_0$ ) describes that the Pooled OLS is the most accurate model for empirical estimation. Whereas, if this hypothesis ( $H_0$ ) is not acceptable, then the alternative one ( $H_1$ ) is considered, which explains why the RE model is more suitable ( $H_1$ : The RE Model is suitable). Moreover, if  $H_0$  of the BPLM test is not recognized, the Hausman test is also implemented to determine the presence of FE. Thus, Hausman's test is implemented to accept a fitting Panel Data Static model i.e. FE) and RE models (Breusch & Pagan, 1980). The Hausman test statistical model is described in Equation 5:

$$H = (b_1 - b_0) (Var(b_0) - Var(b_1)) (b_1 - b_0)(5)$$

Here,  $b_1$  explains the random effects, and  $b_0$  explains the fixed effects estimates. Likewise,  $Var$  indicates the degree of variation. Additionally, this empirical inquiry is set to investigate the performance, i.e., earnings management, of both Malaysian financial categories, i.e., Shariah and non-Shariah, during the recent Covid-19 pandemic period. The independent two-sample t test is executed to perform this comparative analysis. The statistical model of independent two-sample t test is mentioned in Equation 6:

$$t^* = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}(6)$$

Here, Equation 6  $\bar{X}_2$ , and  $\bar{X}_1$  specifies the mean values of the sample. Also, the standard deviation is symbolized by  $S_1^2$  and  $S_2^2$  and the size of a sample is denoted by  $n_1$  and  $n_2$ . The below-given Df in Equation 7 explains the t-distribution of the independent two-sample t test.

$$Df = \frac{[(SE_1)^2 + (SE_2)^2]^2}{\frac{(SE_1)^4}{n_1 - 1} + \frac{(SE_2)^4}{n_2 - 1}}(7)$$

In above Equation 7  $SE_1$  is equal to  $\frac{S_1}{\sqrt{n_1}}$  and  $SE_2$  is equal to  $\frac{S_2}{\sqrt{n_2}}$

As per the numerical standard, which is followed by several researchers (see (Boneau, 1960; Cressie & Whitford, 1986)) if the value of 't' is not more than '0.05', then there is a substantial difference between the two selected samples. Likewise, if 't' value is more than '0.05', then no significant dissimilarity is described between the investigated groups. Technically, some core assumptions are required to be followed before executing this test, such as that the observation of both groups must be independent and continuous, there should be no major outliers, both population variances should be equal, etc (Moser, Stevens, & Watts, 1989).

Figure 1 explains theoretical frame work for Malaysian Shariah-tagged and non-Shariah firms.

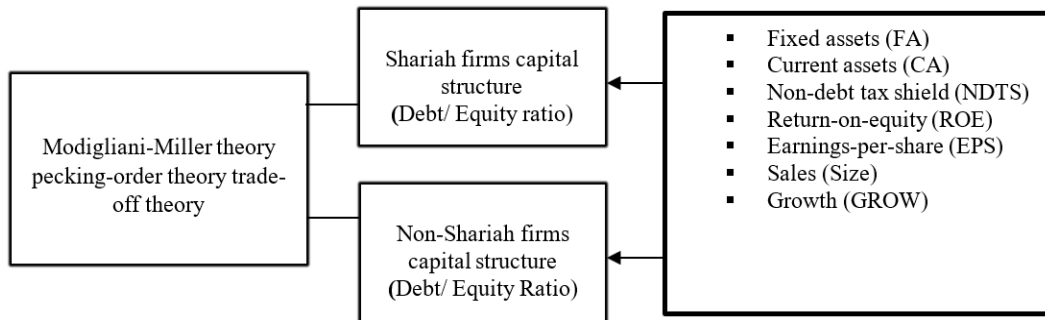


Figure 1. Theoretical framework for Shariah & Non-Shariah firms determinants.

#### 4. FINDINGS

This study aims to examine the factors influencing the capital structure of financial groups operating in Malaysia through a comparative analysis. Besides, this empirical investigation also explores which financial category, either Shariah or non-Shariah provided the best earning management during the peak period of Covid-19 pandemic. The next sub-section 4.1 comprises the outcomes obtained from Panel Data Analysis, which is executed to identify key capital structure determinants for both financial groups in the Malaysian markets.

##### 4.1. Panel Data Analysis (PDA)

All of the nominated determinants are coded into robust SAS statistical software packages to perform an inquiry. The descriptive study of both Shariah and non-Shariah enterprises is conducted independently and presented in Table 2 and Table 3 respectively.

Table 2. Descriptive statistics (111 Non-Shariah firms).

Variables	Maximum	Minimum	Mean	Median	Mode	Std.dev.
D/E	20.15	2.150	0.130	0.640	1.130	2.160
CA	92,416.00	4.79	844.50	189.08	1336.72	2772.55
NDTS	212.13	0.00	751.22	32.45	22.36	12.43
FA	420,830.40	0.00	1,947.67	104.30	0.00	3741.93
GROW	56.28	12.10	19.21	11.39	22.13	9.27
SIZE	22,059.33	0.090	1,001.36	392.70	11.38	2747.33
EPS	82.38	-0.096	0.1930	0.082	0.052	3.150
ROE	55.32	0.0028	0.9032	0.0431	0.0316	2.110

Table 2 displays the mean value of D/E, i.e., 0.13, whereas its median value stands at a level of 0.64. The maximum fixed assets (FA) value for non-Shariah firms is about 421, however, its mean stands at a lower value, i.e., 1,947 million. Also, CA, NDTS, SIZE and Grow mean values are recorded at 844, 751, 1001, and 19 respectively. The mean EPS stands at lower, i.e., 19 cents, which is followed by the mean ROE, i.e., 0.90 percent.

Table 3. Descriptive statistics (343 Shariah-tagged firms).

Variables	Maximum	Minimum	Mean	Median	Mode	Std.dev.
D/E	49.74	0.0021	0.725	0.6721	0.822	0.935
CA	86,341.62	4.722	513.58	181.12	38.74	2940.22
NDTS	414.65	18.38	11.28	17.41	6.20	11.51
FA	121473.21	1.52	857.74	87.13	194.16	2812.61
GROW	78.37	31.41	22.18	32.11	43.01	19.81
SIZE	51342.41	1.61	1821.44	111.36	474.13	3,681.17
EPS	61.16	-7.22	0.180	0.053	1.013	2.620
ROE	32.21	6.48	0.117	0.017	0.040	2.310

Table 3 explains why the mean D/E of Shariah firms, i.e., 0.72, is greater than the mean value of their counterparts. Remarkably, the median of D/E is slightly higher, i.e., 0.67, than its counterpart. Whereas, the



standard deviation of D/E stands at 0.93, which is much lower than the standard deviation of non-Shariah firms. Visibly, all selected independent variables' mean values are observed to be higher than those of non-Shariah firms. In terms of profitability, i.e., EPS and ROE, the non-Shariah firms perform better than their counterparts.

Next, as discussed in section 3, this study executed the BPLM test to check which Panel Data test, i.e., RE or pooled effects, is more appropriate to perform the empirical analysis. Table 4 shows the results obtained from the BPLM test for both financial categories.

**Table 4.** Breusch Pagan lagrange multiplier(BPLM) two-way test.

<b>H<sub>0</sub>: Pooled OLS</b>				
<b>H<sub>1</sub>: Random effects (RE)</b>				
DF	Non-Shariah		Shariah	
	m value	Pr > m	m value	Pr > m
2	9888	0.0001*	2251	0.0001*

Note: \*Significant at 1%.

Table 4 displays the outcomes obtained from the implementation of the BPLM test. Visibly, p-values are recommended to accept the alternate hypothesis (H<sub>1</sub>) for both financial classes. Thus, the RE model is measured as more effective than the other one, i.e., pooled OLS. Now, the Hausman test is also implemented to check the most suitable model between RE and FE. The outcomes are presented in Table 5.

**Table 5.** Hausman test for FE and RE models selection.

<b>H<sub>0</sub>: Existence of random effects</b>			
<b>H<sub>1</sub>: Existence of fixed effects</b>			
DF	m value	Pr > m	Group
7	06.34	0.0001*	Non-Shariah firms
5	59.14	0.4181	Shariah firms

Note: \*Significant at 1%.

The outcomes attained from the Hausman assessment are displayed in Table 5. The p-value (0.0001) for the non-Shariah group visibly specifies the acceptance of the alternative hypothesis. Moreover, for Shariah firms, the p-value (0.4181) indicates acceptance of the null hypothesis.

**Table 6.** Panel data analysis results for FE and RE models.

<b>Parameter estimates</b>								
Model category	Non-Shariah firms (F test, two way FE)				Shariah firms (Wallace Hussain, two way RE)			
	Variables	Estimates	Standard error	t value	Pr >  t	Estimates	Standard error	t value
Intercept	0.9534	0.1081	8.8205	0.0001	0.4384	0.1495	2.93	0.0034
CA	0.2000	0.1315	1.5209	0.1283	0.0002	0.00006	3.83	0.0001***
NDTS	0.0311	0.0191	1.6284	0.1035	0.0003	0.00007	4.82	0.0001***
FA	0.0986	0.0232	4.2509	0.0001***	0.00052	0.0001	4.3336	0.0001***
GROW	0.0231	0.0123	1.8780	0.0604*	0.0501	0.0251	1.9944	0.0466**
SIZE	0.01351	0.0124	1.0895	0.2762	0.00241	0.0121	0.1992	0.8415
EPS	-0.0171	0.0161	-1.0596	0.2893	-0.0397	0.0113	-3.5106	0.0004***
ROE	-0.0192	0.0172	-1.1163	0.2643	-0.0407	0.0259	-1.5707	0.1164

Note: \*\*\*, \*\*, \* Significant at 1%, 5% and 10% level.

Table 6 displays the estimates of two dissimilar financial groups in Bursa Malaysia. The outcomes specify that CA, NDTS, and EPS are significant determinants for Shariah firms. Notably, CA and NDTS maintained a positive whereas EPS maintained a negative but significant relationship with firms' capital structures. Likewise, FA and Grow are observed to be positively significant for both financial groups. Technically, the significant CA, NDTS, and FA explain that the trade-off theory is more dominant in the whole Malaysian market.

The next subsection 4.2 contains the outcomes obtained from the execution of descriptive statistics and independent two-sample t test results.

4.2. Descriptive Statistics & Independent Two-Sample t Test Results

To investigate the financial strength of both groups, this inquiry split profitability measure variables, ROE and EPS, into two subgroups: Shariah and non-Shariah. The hypotheses generated for both variables are:

*H<sub>0</sub>: There is no significant difference in the mean values of both investigated groups.*

*H<sub>1</sub>: There is a significant difference in the mean values of both investigated groups.*

Below Table 7 and Table 8 explain the outcomes obtained from the analysis of the profitability measure variable ROE subgroup.

Table 7. Descriptive statistics (ROE 2019-2020).

Financial groups	N	Mean		Std. dev.		Coefficient of variation (CV)		Minimum		Maximum	
		2019	2020	2019	2020	2019	2020	2019	2020	2019	2020
Non-Shariah	111	0.09681	-0.01318	0.15060	0.1631	15.557	-12.450	-0.426	-0.2453	1.586	1.500
Shariah	343	0.03632	-0.09620	0.11060	0.1011	3.0450	-1.0509	-1.641	-0.6781	1.241	0.813

The descriptive statistics outcomes of ROE for pandemic peak periods, i.e., 2019-2020, are displayed in Table 7. The findings for non-Shariah indicate that the mean ROE for the year 2019 is sustained at 9.6%, whereas the mean for the Shariah group is observed at 3.6%. However, both groups maintained negative mean values during the year 2020.

Table 8. Independent two-sample t test results (ROE, 2019-2020).

Year-2019				
Method	Variance	DF	t value	Pr >  t
Pooled	Equal	452	3.91	0.0001**
Satterthwaite	Unequal	151.76	1.86	0.0629*
Year-2020				
Method	Variance	DF	t value	Pr >  t
Pooled	Equal	452	1.10	0.2713
Satterthwaite	Unequal	151.76	1.02	0.3077

Note: \*\* Significant at 5% level and \* significant at 10% level.

Table 8 explains the statistical outcomes attained from the execution of the Independent Two-sample t Test. The p-values (p < 0.0001 and p < 0.0620) of both methods specify a significant difference in the means ROE of investigated groups during the onset of the pandemic year, i.e., 2019. Evidently, the mean ROE of a non-Shariah category (see Table 7) is maintained at 9.6% in the year 2019, which is higher than its counterpart group mean, i.e., reported, at 3.6%. Nevertheless, the outcomes for the pandemic peak period, i.e., 2020, specify contradictory results and display no statistical difference between Shariah and non-Shariah financial categories during the second year of the financial crisis. Likewise, the below Table 9 and Table 10 describe the findings attained for the profitability measure variable EPS subgroup.

Table 9. Descriptive statistics (EPS 2019-2020).

Financial categories	N	Mean		Std. dev.		Coefficient of variation (CV)		Minimum		Maximum	
		2019	2020	2019	2020	2019	2020	2019	2020	2019	2021
Non-Shariah	111	0.116	-0.0151	0.1812	0.1977	1.562	-13.092	-1.610	-0.558	2.313	1.012
Shariah	343	0.0660	-0.0310	0.1297	0.1781	1.965	-5.7451	-1.005	-0.581	1.161	1.301

The descriptive analysis for the EPS subgroup is displayed in Table 9. The outcomes for the year 2019 specify the dominance of the non-Shariah group. However, in the year 2020, i.e., pandemic peak period both groups reported negative mean values.

**Table 10.** Independent two-sample t test results (EPS, 2020-2021).

Year-2021				
Method	Variance	DF	t value	Pr >  t
Pooled	Equal	452	2.69	0.0071**
Satterthwaite	Unequal	151.76	1.89	0.0096**
Year-2021				
Method	Variance	DF	t value	Pr >  t
Pooled	Equal	452	0.32	0.7490
Satterthwaite	Unequal	154.31	0.21	0.8337

Note: \*\* Significant at 5% level.

Table 10 above displays the statistics attained from the t test Pooled and Satterthwaite tactics, which clearly indicate that the null hypothesis ( $H_0$ ) is not rejected. The significant p-values ( $p = 0.0071^{**}$  and  $0.0096^{**}$ ) in the year 2019 and higher p-values ( $p = 0.7490$  and  $0.8337$ ) in the year 2020 show there is no key difference in both groups' mean EPS during the investigated years 2019 and 2020.

Evidently, the results obtained from the ROE and EPS subgroups postulate that there is no significant difference between mean values of the Shariah and non-Shariah categories during the peak time of the pandemic, i.e., 2020. Clearly, this indicates that the performance of both categories is almost similar and related, as both were affected in the same manner and maintained negative earnings during the pandemic peak period. Thus, the null hypothesis ( $H_0$ ) for this analysis, which indicates the absence of any significant differences between both investigated categories, is not rejected.

## 5. DISCUSSION

This empirical inquiry is set to explore the core differences among capital structure determinants of Shariah-tagged and non-Shariah Malaysian firms. Besides, it also explores the financial performance of these two groups during the peak period of the COVID-19 pandemic and to what extent the financial performance of these two dissimilar financial categories is related. The results obtained from the Panel Data Static model specify that fixed assets (FA) and growth (Grow) are key capital structure determinants for non-Shariah firms, whereas current assets (CA), Non-Debt Tax Shield (NDTS), fixed assets (FA), growth (Grow), and earnings per share (EPS) are the main capital structure determinants for Shariah-tagged firms.

Interestingly, growth and fixed assets are observed to be significant for both types of Malaysian firms. This shows the credibility of these two key determinants for whole Malaysian firms. The positive and significant fixed assets and growth, i.e., the yearly, change in percentage of total assets, indicate that Malaysian firms rely more on their fixed assets. Remarkably, this is because these firms focus more on maintaining asset tangibility to avail short-term debts, which provides security to lenders. [Harc \(2015\)](#) postulates that investors feel their investments are secure if the firms have sound fixed assets. Also, current assets are significant for Shariah-tagged firms. Notably, the Malaysian market is a major fragment, i.e., more than 80% is covered by Shariah firms. Typically, Shariah-tagged firms maintained current assets and depended on short-term financing. This infers that these firms prefer unused and internally created funds, thus maintaining significant current assets to avoid long-term interest-based debt financing ([Thabet et al., 2017](#)). Likewise, significant NDTS also confirms that Shariah-tagged firms focus more on asset tangibility. Technically, firms that have significant NDTS have low debt. This is because depreciation figures decrease taxation expenses, thus saving firms' capital, which is later used to run operations and finance assets ([Rehan et al., 2023](#)). Besides, negative but significant EPS and insignificant SIZE specify that profitability is a main issue for Malaysian Shariah-tagged firms as their sales are not able to generate the required profits. The dominance

of trade-off hypothesis in the Malaysian market is supported by the presence of strong tangibility, growth, and non-debt tax shield, and current assets. Overall, the outcomes indicate that both Shariah-tagged and non-Shariah-tagged firms use dissimilar determinants for building capital structures. For instance, current assets, NDTs, SIZE, EPS and ROE are found insignificant for non-Shariah firms. The findings are in line with the earlier inquiries of Akbar et al. (2023) in the Pakistani context and Hassan et al. (2012) in the Malaysian context, who explained that the capital structure of Shariah-tagged firms is dissimilar from their counterparts i.e., non-Shariah firms. The results are also consistent with the explanations of Ramirez and Kwok (2009) and Baxamusa and Jalal (2014), who described those religious values that impact firms' capital structure-related decisions.

Additionally, this study explores which Malaysian financial category, whether Shariah or non-Shariah, maintained its profitability during the COVID-19 peak period, i.e., 2019-2020, and to what extent their performance is related. The results show that both groups' earnings are affected by the pandemic, and there are no significant differences between their financial performances during the COVID-19 pandemic. Visibly, both groups are measured by two different financial components, which are ROE and EPS, but their results are very similar and related. The negative mean values during the peak period of the pandemic, i.e., 2020, confirm that for Shariah and non-Shariah categories, financial performance is severely affected by the pandemic. However, the non-Shariah firms' category maintained its superiority and was observed to be less affected. The results are in line with the conclusions of Hambali and Adhariani (2023), who confirm that Malaysian and Indonesian Shariah-tagged firms' performance was low during the pandemic. The same goes for Ahmad and Ibrahim (2002) and Farooq and AbdelBari (2015), who concluded that Shariah-tagged firms maintained lower-income management than their counterparts.

## 6. CONCLUSION

This empirical investigation discovers the capital structure determinants for Malaysian Shariah and non-Shariah firms. More specifically, this study adopts a comparative analysis tactic and explores to what extent Shariah and non-Shariah firms' capital structure determinants are dissimilar from each other. Clearly, the results specify that fixed assets and growth are key capital structure determinants for non-Shariah firms. Whereas, current assets, non-debt tax shield, fixed assets, growth, and earnings per share are the main determinants for Shariah-tagged firms functioning in Malaysia. However, earnings per share have a negative relationship with Shariah firms' capital structures. The results explain that growth and asset tangibility are the key capital structure determinants for whole-listed Malaysian firms. The negative profitability and insignificant SIZE of Shariah firms specify that their sales are not up to the mark; therefore, they are not producing sufficient profit. The insignificant current assets, NDTs, Size, EPS, and ROE for non-Shariah firms confirm that capital structure framing choices for both types of firms are not related. Technically, the significant NDTs, liquidity, and tangibility indicate that the trade-off theory is more dominant in the Malaysian market. Additionally, this study also discovers which financial category, either Shariah or non-Shariah, sustained its earnings during the peak period of COVID-19. Clearly, the results show that there is no main difference between the performance, i.e., earning, and management of both types of firms, and they preserved negative earnings during the peak period of the COVID-19 pandemic. The conclusions will be helpful for officials to create a better financing model that offers support for publicly listed Malaysian Shariah and non-Shariah firms to construct the best mixture of existing financial resources. Besides, this inquiry contributes to the literature and delivers evidence that will offer aid for officials in building the ideal financing model for both financial categories, specifically Shariah and non-Shariah, during times of crisis and economic downturns.

The key limitation of capital structure-connected inquiries is the accessibility of financial data, which is the core limitation for discovering appropriate determinants of capital structure (Pandey, 2002). Likewise, this inquiry eliminates all those firms whose financial data is not accessible for the nominated period. Similarly, this study focused only on the Malaysian context and ignored other countries that are operating Shariah and non-Shariah financial categories in parallel. Thus, future investigators should add more firms to the data sample set and inspect

dissimilarities between capital structure determinants of both types of financial categories that are functioning in other contexts. Besides, some other profitability measure determinants, such as return on assets, should be used to check both categories' performance during the COVID-19 peak periods.

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