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Performance of Shariah vs Non-Shariah Firms: A Study of Manufacturing Sector in Malaysia

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Abstract: This research aims to examine the differences in the determinants of performance between Shariah-compliant and non-Shariah-compliant firms. The changes in the Shariah screening technique in Malaysia since 2013 have significantly affected how firms that comply with the Shariah principles, as opposed to non-compliant firms, leading to the motivation of this research being conducted. This research employs panel data regression analysis to test its hypotheses. Compiling data from 142 manufacturing firms (71 Shariah-compliant and 71 non-Shariah-compliant firms) from 2012 to 2021, this research found that Shariah-compliant firm performance is significantly influenced by firm size, leverage, tangibility and efficiency. In contrast, non-Shariah-compliant firm performance is significantly influenced by leverage, tangibility, working capital and efficiency. This research contributes to relevant parties, such as the manufacturing firms and policymakers, in providing insights on the most relevant indicators affecting firm performance, specifically those in the manufacturing sector.

Keywords: *Firm Performance, Shariah Compliant, Non-Shariah Compliant, Panel Regression Analysis, Manufacturing Sector.*

1. Introduction and Background

The comparison associated with Shariah and Non-Shariah compliant firms can be identified from the different firm characteristics, which may influence how the business performs. Generally, firm performance can be related to its financial behaviors and how well the firm uses its resources. Measuring financial performance will show the results of firm policies and operations in terms of money. One of the firm's financial indicators that can measure these results is known as the return on assets (ROA), commonly the main indicator for business performance (Saba et al., 2021). Particularly, firms that are Shariah compliant have different characteristics due to the firms' obligations to operate under the Shariah principles. Under Shariah principles, three main activities are prohibited, which are riba (interest), gharar (uncertainties) and maysir (gambling) (Aman, 2020). Avoiding these is essential so people can achieve social justice, economic success, and brotherhood in the community. Shariah principles also reflect the inclusive understanding of Islam, and maximizing profits is not the fundamental goal of an Islamic society overall.

Moreover, there are at least two characteristics that set Islamic businesses apart from non-Shariah compliant. They must first obey firm screening requirements and are not allowed to operate in the entertainment industry. Second, financial screening must be followed in all aspects of their operations. To ensure that their operations adhere to Shariah principles, businesses are analyzed using financial measures to determine whether or not they generate revenue from forbidden sources. These distinguishing characteristics of Islamic businesses may indicate different behavior from conventional businesses, which may affect how they perform in contrast to non-Shariah compliant firms.

Different markets have different screening techniques, which may be the root cause behind firms' performances. In Malaysia, the Shariah screening technique 2013 comprises of two-tier approach to the quantitative assessments and uses both the business activity standards and the newly proposed financial ratio benchmarks (Adam & Bakar, 2014). Accordingly, firms will have to maintain their Shariah-compliant status using the screening benchmark requirements. The firm must go through cash and debt ratio screening as part of the second tier of the quantitative evaluation, designed to quantify riba-based factors in the organization. Aside from the new financial ratios screening, the number of mixed operations permitted has decreased to ensure rigid compliance with the Shariah principles and a stable Islamic financial system. Thus, the performance of Shariah-compliant may be higher than non-Shariah-compliant due to limitations in terms of debt, liquidity, and permitted activities. In contrast, most non-Shariah-compliant businesses will face significant risks due to excess liquidity, high debt and poor risk management, all of which contribute to uncertainty and lower profitability (Alahouel & Loukil, 2021). However, this could also mean that Shariah-compliant firms may miss the chance to make more money from a combination

of activities to comply with the Shariah principles. Thus, this research highlights that the revision of the screening techniques for Shariah-compliant firms has somewhat altered the firms' business activities (Shariah or non-Shariah), urging this study to find out the difference between the determinants that affect the performance of Shariah-compliant firms and non-Shariah compliant firms.

From a business view, it is important to determine and make an effort to improve the firm's performance because the world is getting more advanced and developing. An emerging country such as Malaysia needs to adapt this quickly to stand together with other countries regarding economic growth (Ho & Mohd-Raff, 2019), especially in the manufacturing sector. It is widely acknowledged that Malaysia's manufacturing sector significantly impacts the country's exports, job creation, and economic growth. Malaysia has successfully attracted big investments from multinational corporations and built a world-class manufacturing base. Malaysia's manufacturing sales were worth RM143.9 billion in December 2021, which was 15.5% more than the same month last year (DOSM, 2021). Considering that the manufacturing sector is among the fastest-growing industry[1] in Malaysia, which is an area that can help with the country's economic growth (Islam & Karim, 2011), this research focuses its scope on the manufacturing sector.

This research paper emphasizes the performance of firms in Malaysian manufacturing businesses that are both Shariah and non-Shariah compliant. Since investments in Shariah-compliant instruments are growing quickly, it would be interesting to see if there are any differences between the factors that affect the performance of Shariah-compliant and non-Shariah-compliant firms. Regarding debt and liquidity, this research is proposing that Shariah-compliant firms should be less risky. It would be insightful to examine the different determinants that can affect the performance of firms listed explicitly under the manufacturing sectors. Theoretically, this research intends to add to the existing literature on determining firm performance in the Malaysian manufacturing industry, specifically those with Shariah and non-Shariah compliant status. Practically. The findings in this research should assist investors, fund managers, policymakers, and other players in the industry in developing a better investment plan by considering all of the variables that influence the firm's performance.

2. Literature Review

Firm Performance: In this research, firm performance is measured using the firms' level of profitability, i.e., the return on asset (ROA). The level of a firm's profitability is the major focus of any business since it is important to both internal and external parties. Firms need to ensure that they can generate profit. Several studies have measured firms' levels of profitability using ROA. For example, Margaretha and Supartika (2016) examine the relationships between firm-specific variables and the profitability of Indonesian Small and Medium Enterprises (SMEs) listed on the Indonesia Stock Exchange. The findings of this study, which were based on a sample of 22 SMEs between the years 2007 to 2012, revealed that factors such as firm size, growth, lagged profitability, productivity and industry affiliation significantly influence profitability. But the age of the firm has no significant impact on profitability. Ho and Mohd-Raff (2019) examine the relationship between external and internal determinants of the performances of Shariah and non-Shariah-compliant firms in Malaysia. The findings of this study, which were based on a sample of 51 Shariah-compliant and 18 non-Shariah-compliant firms between 1999-2015, revealed that firm size, financial distress, growth opportunity, liquidity, capital structure and working capital have a significant impact on the performance while for external factor revealed that interest rate, trade openness and the exchange rate has a significant influence towards performance.

Al-Jafari and Al Samman (2015) studied 17 industrial firms in Oman that were issued on the Muscat securities market between 2006 and 2013, measuring the profitability of the firms using ROA and profit margin. The findings obtained from the regression analysis show that size, growth, and working capital have a positive and significant effect on ROA and profit margin. In contrast, leverage has a negative and significant impact on all profitability indicators. According to the findings of another study conducted by Vintilă and Nenu (2015), there is a significant correlation between the dependent variables, which is ROA with firm size and the ratio of sales to total equity. While growth, asset tangibility and debt structure are negatively related to ROA. Therefore, this research identifies that ROA has been commonly used as an indicator of firm performance.

[1] According to the Department of Statistics Malaysia Official Portal (2022), the manufacturing sector of Malaysia had its greatest sales value of RM144.6 billion in March 2022. This represents an increase of 13.9 % when compared to the same month of the previous year.

Firm Size: There are a variety of ways that the size of a firm may be measured, which include the total assets, total sales, market capitalization, and the number of employees. The revenue or total sales measure product market competition and are used to indicate firm size in this research. When it comes to the relationship between firm size and profitability, the findings are inconsistent. Unal et al. (2017) examined 112 manufacturing firms listed on the Borsa Istanbul between 2005 to 2013. They found that the firm size has a positive relationship with profitability. The authors concluded that the larger the firm, the greater the profitability it may make from its operations.

Das et al. (2021) also discovered a positive relationship between the firm size and profitability in Bangladesh's nonfinancial sector from 2007 until 2016. According to the findings of the research, firm size has both a positive and significant influence on the return on equity (ROE) and ROA. The authors conclude that the larger the firm size, the better the firm's performance. Strong evidence of a positive link between business size and profitability was found in Doğan (2013) between 2008 to 2011. In this study, total sales were used as a proxy for firm size, and the author examined 200 firms listed on the Istanbul Stock Exchange. This also means that a firm is more profitable when sales increase. Therefore, this research suggests that larger firms will result in better performance.
H1: There is a positive relationship between firm size and firm performance.

Liquidity: Liquidity is the ability of a firm's assets or securities to be easily turned into cash. Liquidity ratios show how much of a safety margin a firm has and how well it can pay its short-term debts. Even though a firm needs liquidity to stay in business, too much can cause it to miss out on investment opportunities and make less money (Calcagnini et al., 2020). Several studies in the past have identified a favorable relationship between liquidity and profitability.

Alsharari and Alhmoud (2019) studied the determinants that affected the profitability of Shariah compliance in Jordan. Size, liquidity, leverage, sales growth, and gross domestic product were looked at as IVs, and the ROA was utilized to assess corporate profitability. Ordinary least squares (OLS) and fixed-effects estimates were used to analyze the data from 28 Sharia-compliant businesses from 2013 to 2015. The results show a positive and strong relationship between size, liquidity, sales growth and ROA. Similar results were found by Nanda and Panda (2018) using the data from Indian manufacturing enterprises between 2000 and 2015 to examine the variables that affect profitability. They reported that firm size and liquidity enhance firm profitability.

Nguyen and Nguyen (2020) studied the determinants of profitability based on Vietnam-listed enterprises. About 120 firms provided the information for the years 2012 through 2014. The study used the current ratio to measure liquidity, while ROA and ROE were utilized to measure firm profitability. The findings indicate that profitability is positively and significantly associated with business size, solvency, and liquidity. Consistent with past studies, this research hypothesizes that higher liquidity levels will result in favorable firm performance.
H2: There is a positive relationship between liquidity and firm performance.

Leverage: The amount of debt utilized to support additional capital expenditures that might enhance a firm's financial performance is known as leverage (Lin et al., 2006). It aims to determine the percentage of total assets funded by borrowed money. Additionally, several methods evaluate leverage, including total debt to total assets, short-term debt to total assets, and long-term debt to total assets (Le & Phan, 2017).

According to Mathur et al. (2021), leverage and firm performance are inversely associated. The findings demonstrate that the explanatory factors, total debt ratio, long-term debt ratio, and short-term debt ratio negatively affect the firm performance. The results are consistent with the pecking order concept, which holds that high debt financing decreases a firm's value since debt carries a repayment obligation and debt financiers prefer to avoid riskier undertakings. High debt financing also raises a firm's financial risk, which leads to liquidity and operational risk. However, Egbunike and Okerekeoti (2018) highlighted that leverage has a major impact on consumer products manufacturing businesses' profitability. Firm size, leverage, and liquidity all had positive and substantial effects, according to the study of firm characteristics. Charles et al. (2018) discovered that size and leverage considerably impact profitability in Nigeria, while liquidity has little impact. This is in line with Ayaz et al. (2021), who examined data from 528 nonfinancial firms registered on the Bursa Malaysia Stock Exchange over 12 years (2005-2016) and discovered a strong negative relationship between leverage and profitability. In line with past studies, this research suggests that higher leverage levels will deteriorate firms' performance.
H3: There is a negative relationship between leverage and firm performance.

Tangibility: The ratio of a firm's tangible assets to its total assets is the best indicator to measure tangibility. Furthermore, firms with a high amount of tangible assets were most likely to have greater debt (Saba et al., 2021b). Tariq Bhutta and Hasan (2013) study shows an insignificant positive correlation between tangibility and profitability. This is because tangibility has a negative coefficient, which indicates that it has an insignificant relationship with profitability. The authors concluded that the firm is more profitable if it has a lower tangibility of assets.

Zeitun and Saleh (2015) also get the same result when the authors investigate the relationship between the tangibility of firms in Gulf Cooperation Council (GCC) countries with firms' performance using ROA. The negative coefficient of tangibility suggests that a greater tangibility ratio might have a negative impact on the performance of a firm. The research recommends that businesses in the GCC countries either reduce the amount of money they spend on investing in fixed assets or increase the efficiency of fixed assets. Therefore, firms with more tangible assets should negatively impact firm performance.
H4: There is a negative relationship between tangibility and firm performance.

Working Capital: Working capital is the difference between a firm's current assets and its short-term liabilities. It is a monetary measure that reveals how liquid is a business, organization, or other entities in terms of its operations. Working capital management helps operations run smoothly and helps the firm make more money and be more profitable.

Alarussi and Gao (2021) examined the variables influencing profitability in Chinese listed businesses and discovered a significant relationship between working capital and profitability. According to the research, positive working capital is crucial to reducing the cost of capital and boosting a firm's profitability. Alarussi and Alhaderi (2018) also found a similar finding. Working capital and profitability have a significant positive relationship, which looks at the variables influencing profitability in Malaysian-listed firms. Tareq et al. (2021) have shown that a firm's working capital management has a major impact on its profitability and that firms may increase their profitability via working capital management.

In addition, Sawarni et al. (2022) measured the efficiency of a sample of 431 nonfinancial firms from 2012 to 2019. The findings indicated that a firm's working capital management significantly impacts its profitability and that working capital management may help businesses increase their profitability. There is also a study that found that working capital is not relevant to firm performance. For instance, Sivathaasan et al. (2013) examined the relationship between profitability as defined by ROE and ROA and factors such as capital structure, working capital, business size, non-debt tax shield, and growth rate. The findings indicate that the capital structure and non-debt tax shield have a statistically significant impact on profitability. On the other hand, this impact is not influenced by working capital, growth rate or business size. However, according to the majority of literature, this research hypothesizes that higher working capital can increase firms' profitability.
H5: There is a positive relationship between working capital and firm performance.

Efficiency: Firm efficiency assesses a firm's capacity to manage its obligations and efficiently use its assets to produce short-term income. Efficiency is, without a doubt, the key to generating bigger revenues. Efficiency may apply to a firm's whole operations. Firm efficiency will use the asset turnover ratio as a proxy whereby the calculation is net sales divided by average total assets (Alarussi, 2021).

Asset turnover ratio and profitability have a positive relationship. Gaio and Henriques (2018) studied the profitability and compared the large enterprises and small and medium-sized firms (SMEs) in the European Union. The analysis reveals that the asset turnover ratio significantly relates to profitability. Next, Warrad and Omari (2015) examined how the turnover ratios of total and fixed assets affected the ROA of businesses in the industrial sector of Jordan. From 2008 to 2011, a simple linear regression was used, and the total assets turnover ratio significantly impacted the ROA of the Jordanian industrial sector. Consequently, the total assets turnover ratio may explain changes in ROA.

A similar result was obtained by Alarussi and Alhaderi (2018), who investigated the relationship between business productivity and financial success in Malaysian listed businesses. A total of 120 firms provided information for the years 2012 through 2014. In this study, ROE and earnings per share (EPS) were used to evaluate the profitability of the firms, while total sales were used to evaluate the firm size, current asset-current

liability ratio measured working capital, assets turnover ratio measured business efficiency, current ratio measured liquidity, and debt-equity ratio measured leverage. The findings revealed a significant positive relationship between firm efficiency (assets turnover ratio) and profitability.

However, Lim and Rokhim (2020) examined the profitability of Indonesia's pharmaceutical sector from 2014 to 2018. According to the findings, there is a negative relationship between profitability, sales growth, and the percentage of total assets. This research explores the assets turnover ratio as one of the profitability metrics. As a result, profitability and business efficiency (as determined by the assets turnover ratio) are anticipated to be positively significant.
H6: There is a positive relationship between efficiency and firm performance.

Shariah-compliant: In Malaysia, firms may be classified as either Shariah or non-Shariah-compliant. There may be differences in performance between Sharia-compliant and non-Sharia-compliant firms because of how they operate and react to unexpected events. According to research that was conducted by Farooq and Alahkam (2016), it was found that Shariah-compliant firms underperformed within the standard period. According to the same research findings, the authors also found that Shariah-compliant firms performed much better than non-Shariah-compliant firms throughout. This is because Shariah-compliant firms with less leverage have a reduced chance of going into bankruptcy risk. Shariah-compliant firms do minimize their leverage through a Shariah screening methodology (Mohd-Sanusi et al., 2015). Similarly, Alnori and Alqahtani (2019) have shown through empirical research that Sharia-compliant firms use less leverage and shift more slowly to their optimum levels of capital structure.

The same study on Shariah and non-Shariah firms in Malaysian listed firms by Guizani and Abdalkrim (2021) emphasized that Shariah-compliant firms have a lower potential for growth than non-Shariah-compliant firms. This is because Shariah-compliant firms have restricted access to available financing where they need to take riba, gharar and maysir into consideration. According to the authors, the slower growth of Shariah-compliant firms results in lower capital expenditures compared to non-Shariah-compliant firms, which have a greater variety of financing alternatives. Non-Shariah firms are doing better than Shariah-compliant firms in terms of total assets and profitability (Rehan & Abdul Hadi, 2019).
H7: There is a positive relationship between Shariah-compliant status firms and firm performance.

3. Research Methodology

Research Design and Data Collection

The whole set of data for this research was gathered over ten years, from 2012 to 2021. The focus of this research is Malaysian manufacturing firms. First, the Bursa Malaysia website collected data on manufacturing businesses. In the manufacturing industry, there are 262 firms. In addition, this research eliminated some of the firms for whom the data were not included in the data stream, leaving a final sample of 142 firms. The analysis then separates 142 firms into two categories: those that adhere to Shariah compliance and those that do not. In this research, to be classified as Shariah-compliant firms, the firms in the manufacturing sector need to be listed as such for the whole 10 years of the study period, which includes 20 announcements of the firms' Shariah status. In addition, to be classified as non-Shariah firms, the firms are screened by considering those who are unable to retain their status after the 20 announcements. The sample had 142 businesses remaining, 71 of which were Shariah-compliant and 71 were non-Shariah compliant firms.

Before the multiple regression analysis, this research tests for several diagnostic tests, some of which include the outlier test, normality test, stationary test, multicollinearity test, heteroskedasticity test and serial correlation test to fulfill the assumption of panel regression analysis. The regression model explains the relationship between firm size, liquidity, leverage, tangibility, working capital, efficiency, and Shariah-compliant firms and firm performance. The measurement of each variable is listed in Table 1. Equations 1, 2 and 3 describe the regression models tested in this research. Equation 1 indicates Model A, representing the full sample (combination of Shariah and Non-Shariah compliant firms). Equation 2 indicates Model B, representing the Shariah-compliant sample and Equation 3 indicates Model C, representing the non-Shariah-compliant sample.

$$FP_{it} = \beta_0 + \beta_1(FS)_{it} + \beta_2(LIQ)_{it} + \beta_3(LEV)_{it} + \beta_4(TATA)_{it} + \beta_5(WC)_{it} + \beta_6(EFF)_{it} + \beta_7(SC)_{it} + \mu_{it} \quad (1)$$

$$FP_{it} = \alpha_0 + \beta_1(FS)_{it} + \alpha_2(LIQ)_{it} + \alpha_3(LEV)_{it} + \alpha_4(TATA)_{it} + \alpha_5(WC)_{it} + \alpha_6(EFF)_{it} + \varepsilon_{it} \quad (2)$$

$$FP_{it} = \Upsilon_0 + \beta_1(FS)_{it} + \Upsilon_2(LIQ)_{it} + \Upsilon_3(LEV)_{it} + \Upsilon_4(TATA)_{it} + \Upsilon_5(WC)_{it} + \Upsilon_6(EFF)_{it} + \delta_{it} \quad (3)$$

where FP is the firm performance, FS is the Firm size, LIQ is the Liquidity, LEV is the Leverage, TATA is the Tangibility, WC is the Working Capital, EFF is the efficiency, and SC is the Shariah-compliant firm status.

Table 1: Measurements of Variables

Variable	Proxy	Measurements	Source
Firm Performance	ROA	$= \frac{Net\ Income}{Total\ Asset}$	(Agusta et al., 2018; Al-Jafari & Al Samman, 2015; Vintilă & Nenu, 2015)
Firm Size	Total Sales	Natural Logarithm of Firm's Total Sales	(Aydın Unal et al., 2017; Das et al., 2021; Doğan, 2013)
Liquidity	Quick Ratio	$= \frac{Current\ Assets - Inventories}{Current\ Liabilities}$	(Ho & Mohd-Raff, 2019)
Leverage	Debt Ratio	$= \frac{Total\ Debt}{Total\ Asset}$	(Dioha et al., 2018)
Tangibility	TATA	$= \frac{Tangible\ Asset}{Total\ Asset}$	(Tariq Bhutta & Hasan, 2013; Zeitun & Saleh, 2015; Işık, 2017)
Working Capital	WC	$= \frac{Net\ Sales}{Sales\ Receivable}$	(Tareq et al., 2021; Sivathaasan et al., 2013)
Efficiency	Asset Turnover	$= \frac{Net\ Sales}{Average\ Total\ Asset}$	(Gaio & Henriques, 2018; Warrad & Omari, 2015)

4. Results and Discussions

Descriptive Statistics

The findings for descriptive statistics analyses for Models A, B and C are presented in Tables 2, 3 and 4, correspondingly. Model A comes with 1,258 observations, comprising 141 manufacturing firms, Shariah-compliant firms and non-Shariah-compliant firms from 2012 until 2021. After that, 141 manufacturing firms are classified into Shariah firms and non-Shariah firms. Model B consists of Shariah firms with 71 firms and 654 observations. While for Model C consists of non-Shariah firms with 70 firms and 604 observations.

Table 1: Descriptive Statistics (Full Sample)

Model A

	Min	Mean	Max	Median	Std. Dev.
Profitability (percent)	-0.16	0.03	0.20	0.03	0.06
Firm Size (percent)	6.21	12.11	16.95	12.06	1.55
Liquidity (times)	0.01	2.48	29.85	1.57	3.09
Leverage (percent)	0	0.16	0.65	0.12	0.14
Tangibility (percent)	0	0.35	0.96	0.32	0.21
Working Capital (times)	0.08	5.90	71.96	4.73	4.95
Efficiency (times)	0	0.80	3.15	0.76	0.48

Table 2: Descriptive Statistics (Shariah-compliant Sample)

Model B

	Min	Mean	Max	Median	Std. Dev.
Profitability (percent)	-0.14	0.04	0.20	0.04	0.05
Firm Size (percent)	8.31	12.30	16.95	12.39	1.40
Liquidity (times)	0.01	1.95	14.01	1.48	1.74
Leverage (percent)	0	0.14	0.46	0.12	0.11
Tangibility (percent)	0.02	0.40	0.96	0.36	0.20
Working Capital (times)	0.73	6.68	71.96	5.32	5.73
Efficiency (times)	0.04	0.84	2.62	0.84	0.42

Table 3: Descriptive Statistics (Non-Shariah Compliant Sample)

Model C

	Min	Mean	Max	Median	Std. Dev.
Profitability (percent)	-0.16	0.03	0.19	0.02	0.06
Firm Size (percent)	6.21	11.89	16.24	11.83	1.68
Liquidity (times)	0.16	3.05	29.85	1.71	4.00
Leverage (percent)	0	0.17	0.65	0.13	0.16
Tangibility (percent)	0	0.29	0.86	0.27	0.19
Working Capital (times)	0.08	5.06	29.51	4.13	3.76
Efficiency (times)	0	0.76	3.15	0.69	0.53

The findings of descriptive statistics indicate that, on average, the performance of Shariah-compliant firms and non-Shariah-compliant firms are almost identical. The result that can be drawn from this is that Shariah-compliant firms have a mean ROA value of 4%, which indicates that they are more profitable than non-Shariah-compliant firms (3%). As shown by Model B in Table 3, Shariah firms display the highest performance value, 20%, while non-Shariah firms present the lowest performance value, -16%. In addition, the findings demonstrate that Shariah firms have a greater size than non-Shariah firms, with average total sales of 12.30% compared to 11.89%, respectively. This result is supported by Das et al. (2021) mentioning that larger firm size leads to better firm performance. The descriptive statistics table for Model C shows that the non-Shariah firms have the smallest firm size, with a value of 6.21%, while the Shariah firms have the largest firm size, with a value of 16.95%.

It can also be seen from Table 3, Model C, that non-Shariah firms have larger average liquidity than Shariah firms. This may indicate that non-Shariah firms are better at meeting their short-term spending obligations and can create cash more quickly in an unexpected event. Model B shows that the Shariah-compliant firms have the lowest value of liquidity, 0.01 times, while non-Shariah-compliant firms, 29.85 times present the highest value of liquidity. Furthermore, non-Shariah firms show high leverage with a mean value of debt ratio of 17% more than Shariah firms, 14%. This may be because Shariah firms are restricted access to available financing where they need to take riba, gharar and maysir into consideration. However, non-Shariah firms have a greater variety of financing alternatives. In Model A, a minimum leverage value is 0%, and this value is derived from both Shariah firms and non-Shariah firms. Meanwhile, the maximum value of leverage in Model A is 65%, which is come from non-Shariah firms.

Table 3, Model B demonstrates that Shariah-compliant firms have a greater tangibility, up to 40%, compared to non-Shariah-compliant firms, which only have 29%. This may indicate that Shariah firms are making use of the tangibility of their assets to lessen the negative influence that debt has on their financial performance. In Model A, the lowest 51 value of tangibility is from non-Shariah firms, 0%, and the highest value of tangibility is from Shariah firms, 96%. Besides that, Shariah firms have an average working capital of 6.68 times, which is greater than the

average of 5.06 times for non-Shariah firms. This demonstrates that Shariah firms have the potential for future growth and can maintain a higher level of profitability over the long term (Jaafar et al., 2020). From Model A, the statistic table shows that the minimum value of working capital, 0.08 times is from non-Shariah firms. In contrast, the maximum value of working capital is from Shariah firms, 71.96 times.

The average efficiency of Shariah firms is 0.84, which is higher than the average efficiency of non-Shariah firms, which is 0.76. As a result, this may be seen as evidence that Shariah firms are better at turning their assets into sales. From Model A, we can observe that the lowest and highest efficiency value is presented by non-Shariah firms with 0 times and 3.15 times, respectively.

Diagnostic Testing

Before the multiple regression analysis, this research runs several diagnostic tests, including outlier, normality, stationary, multicollinearity, heteroscedasticity and serial correlation tests. An outlier is a set of data or an observation that stands out from the rest of the points due to its abnormal distance from others and removing the outliers will prevent distortion of data due to extreme values. This research employs the Cook's Distance test to identify the outliers. After running an outlier's test, there are 119 observations removed from 1,377 observations, leaving 1,258 observations in Model A. Figure 1 and Figure 2 show the scatter plot before and after removing the outliers. Thus, the issue of outliers is resolved in this research.

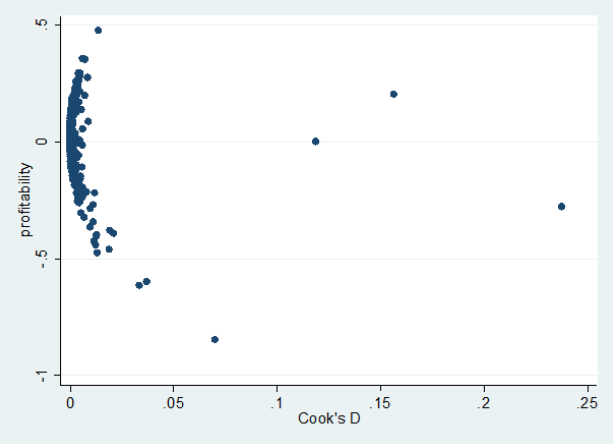

Figure 1: Before removal of outliers

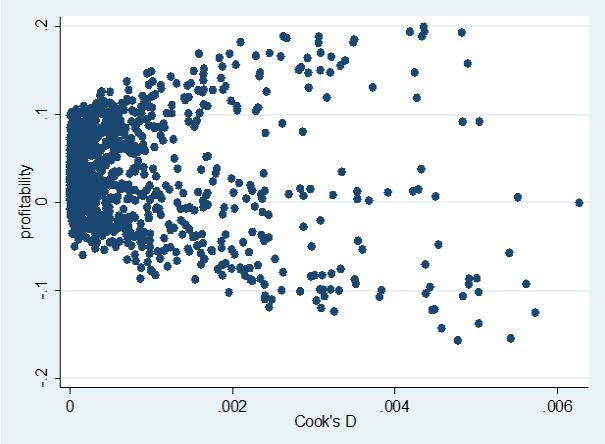

Figure 2: After removal of outliers

Next, this research runs the normality test, which the investigation is referred from the skewness and kurtosis of data. For Model A, based on Table 4 it shows that the prob>chi2 is 0.00 which is less than the threshold, 0.05. This means that the null hypothesis may be rejected since the residuals do not have a normal distribution. In addition, Model B and Model C also have abnormal distributions, where the prob>chi2 is less than 0.05. The result indicates that all null hypotheses can be rejected since all the residuals in Models A, B and C are not normally distributed the violation of the normality assumption is only a concern when dealing with relatively small sample sizes, whereas it is not an issue when dealing with relatively high sample sizes (Schmidt and Finan, 2018). Therefore, the central limit theorem makes normality distribution less crucial for large sample sizes, which are also used in this research.

Table 4: Skewness and Kurtosis Test

	Obs.	Prob. (Skewness)	Prob. (Kurtosis)	Adj. chi2	Prob>chi2
Model A	1,258	0.0015	0.0002	21.46	0.0000***
Model B	654	0.0001	0.0018	21.24	0.0000***
Model C	601	0.7273	0.0069	7.29	0.0265**

**** significant at 1% level, ** significant at 5% level, * significant at 10% level*

Moving on, this research runs for the stationary test to ensure long-term data stability. The Phillips–Perron test is used in the performance of this unit root test. The findings of the unit root test are shown in Table 5 of this research. The alternative hypothesis for panel data states that at least one of the panel data sets is stationary, in

contrast to the null hypothesis for panel data, which states that all panel data contain unit roots. As a result, to provide a satisfactory result, the data must reject the null hypothesis, indicating that not all panel data includes a unit root. Based on the findings, this research concludes that profitability; firm size, liquidity, leverage, tangibility, working capital and efficiency have no unit root issue for the overall model and are significant at the 1% level. With a significant value lower than 0.10, we can reject the null hypothesis and accept the alternate hypothesis, which indicates that the data have no stationary issue. This means that panel data or long-run data used from the studies are correct and reliable.

Table 5: Phillips-Perron Unit Root Test

Variables	Model A Chi^2	Model B Chi^2	Model C Chi^2
Profitability	521.10***	217.96***	303.14***
Firm Size	542.01***	204.60***	337.41***
Liquidity	612.32***	367.35***	244.97***
Leverage	635.20***	259.51***	375.70***
Tangibility	910.21***	321.86***	588.35***
Working Capital	515.38***	273.23***	242.15***
Efficiency	686.25***	397.54***	288.71***

In this research, a multicollinearity test is carried out to investigate the correlation that may exist between two or more independent variables, as well as to determine whether or not these variables are significantly associated with one another. The Variance Inflation Factor (VIF) test is conducted to investigate any possible multicollinearity issues that may be present in this data collection. The rule of thumb for the VIF is used to predict the outcomes of the centered VIF with a value lesser than 10 for the absence of multicollinearity in the model. Based on the findings in Table 6, suggests that the variables are in good condition (value less than 10). Thus, this study claims that there is no severe multicollinearity issue in this research for all models.

Table 6: Variance Inflation Factor Test

Variables	Model A	Model B	Model C
Firm Size	1.51	1.21	1.97
Liquidity	1.41	1.46	1.38
Leverage	1.49	1.51	1.59
Tangibility	1.36	1.63	1.18
Working Capital	1.28	1.27	1.58
Efficiency	1.40	1.43	1.66
Mean VIF	1.37	1.42	1.56

This research tests for heteroscedasticity to detect error components of the model with a constant variance. Using the Breusch-Pagan and Cook-Weisberg tests and the Modified Wald Test, this research found that there the null hypothesis is rejected, indicating the existence of a heteroscedasticity issue in the model (refer to Tables 7 and 8). To solve this issue and ensure that the final estimation is balanced and that there are no issues with reliability, robust standard error analysis is carried out for the panel data estimation. This research further conducts the last diagnostic test to overcome the issue of serial correlation using the Wooldridge test (refer to Table 9) to identify the correlation that would exist if the error terms of variables were found to be associated with one another over several times frames. Based on the results in Table 9, it has been determined that all of the models are significant at the 1% level of significance. If the probability is less than the 10% significant threshold, this indicates that the null hypothesis of the serial correlation test must be rejected as a result. Based on the result, we make use of the alternative hypothesis, which indicates that there is an issue with serial correlation. This research uses cluster robust standard error to solve these issues. Cluster robust standard error is conducted to remedy both the serial correlation and the heteroskedasticity problems that were discovered priory.

Table 7: Breusch-Pagan and Cook-Weisberg Test

	Model A	Model B	Model C
Chi^2	4.41**	4.77**	0.84

Table 8: Modified Wald Test

	Model A	Model B	Model C
Chi²	16263.67***	10088.75***	2070.27***

Table 9: Wooldridge Test

	Model A	Model B	Model C
F	47.74***	20.34***	30.55***

Panel Data Testing

To choose the best-fitted model, this research conducts panel data testing by comparing all three-panel data estimations, Panel Ordinary Least Square model (POLS), Fixed Effect model (FEM), and Random Effect model (REM). There are three-panel data tests: The f-Chow test, the Breusch-Pagan Lagrangian model (BPLM) test, and the Hausman test, where the threshold for every test is 0.1.

The F-Chow test is conducted to compare POLS and FEM. Tables 10, 11, and 12 shows the result for the F-Chow test, BPLM test, and Hausman test, respectively. Model A, for the F-Chow test (Table 10), shows that the p-value is less than 0.1. Thus, the model chosen is FEM. For the BPLM test (Table 11), the p-value for chi-bar-square (chibar2) is 0.0000. This can indicate that the REM is better than POLS. The last panel data testing is to compare FEM and REM using the Hausman test. Based on Table 6, the test shows that the p-value for chi-square (chi2) is significant at a 1% level. However, the dummy variable results were omitted when regressed using FEM. It indicates that FEM is not suitable for achieving the research objective. This can be concluded that REM is an appropriate model for Model A.

For Model B, after running the F-Chow test (Table 10) to compare POLS and FEM, the p-value for the F statistic is significant at a 1% level. FEM is the appropriate model. For the BPLM test (Table 11), the p-value for Chibar2 showed that it is significant at a 1% level. This indicates that REM is better than POLS. Lastly, between FEM and REM, the Hausman test (Table 12) showed that FEM is an appropriate model of estimation because the p-value of Chi2 is significant at a 1% level. Therefore, FEM will be used as a model of estimation for Model B.

In Model C, the F-Chow test (Table 10) showed that the p-value for the F statistic is less than the threshold, 0.1. This indicates that FEM is better than POLS. Furthermore, in the BPLM test (Table 11), the result showed that REM is an appropriate model compared to POLS since the p-value of Chibar2 is significant at a 1% level. Lastly, the Hausman test (Table 12), showed that FEM is an appropriate model of estimation because the p-value of Chi2 is significant at a 5% level. As a result, Model C will be based on the FEM Model as an interpretation of the result.

Table 10: F-Chow test

	F	Prob>F	Appropriate model
Model A	8.16	0.0000***	FEM
Model B	10.66	0.0000***	FEM
Model C	6.47	0.0000***	FEM

**** significant at 1% level, ** significant at 5% level, * significant at 10% level*

Table 11: BPLM test

	Chibar2	Prob> Chibar2	Appropriate model
Model A	783.35	0.0000***	REM
Model B	530.45	0.0000***	REM
Model C	267.80	0.0000***	REM

**** significant at 1% level, ** significant at 5% level, * significant at 10% level*

Table 12: Hausman test

	Chi2	Prob>Chi2	Appropriate model
Model A	45.22	0.0000***	REM
Model B	47.17	0.0000***	FEM
Model C	16.66	0.0106**	FEM

**** significant at 1% level, ** significant at 5% level, * significant at 10% level*

Determinants of Firm Performance

The results of the Panel Data Testing indicate that the Random Effect Model is the one that provides the best fit for Model A and Model C. Meanwhile, the Fixed Effect Model provides the best fit for Model B. This research opts for the Cluster Standard Error Estimations to overcome the issue of heteroscedasticity. Table 13 is the Panel Regression analyses' findings, including Models A, B, and C.

The Wald chi2, also known as F statistics for Models A, is significant at a 1% level, indicating that Random Effect Model is an accurate estimation for this model. The Wald chi2 for Models B and C are also significant at a 1% level, proving that the Fixed Effect Model is an accurate estimation for both models. As for the R-Squared, it is determined based on the result of panel data estimations. The overall R-Squared for Random Effect Model A is 0.2279. This indicates that the independent variables of this research may explain 22.79% of the variations in the performance of Shariah and non-Shariah-compliant manufacturing firms. Another 77.21% of the data may be explained by a different variable not considered in the model. The R-squared test for Model B is 0.2653, which shows that the independent variables can explain 26.53% of the variation in the performances of Shariah manufacturing firms. The remaining can be explained by other variables not included in the model. Lastly, the R-squared for Model C is 0.2470, demonstrating that the independent variables explain 24.70% of the variation in performances for non-Shariah-compliant manufacturing firms. The rest could be explained by additional factors that were not considered.

Table 13: Multiple Regression Analysis Results

Variables	Model A Coef.	Model B Coef.	Model C Coef.
Firm Size	0.0098***	0.0297***	0.0070
Liquidity	0.0008	0.0014	0.0001
Leverage	-0.1269***	-0.1093***	-0.1173***
Tangibility	-0.0462***	-0.0701**	-0.0665**
Working Capital	0.0013***	0.0008	0.0026**
Efficiency	0.0446***	0.0610***	0.0578***
Shariah Compliance	0.0051	-	-
Constant	-0.1006***	-0.3437***	-0.0761
R-Squared	0.2279	0.2470	0.2653
Wald chi²	169.79***	11.67***	11.76***
Observations	1256	654	602

Model A and Model B show a significant and positive relationship between the firm size and profitability for both firms and Shariah firms. The firm size for model A and model B has a significant relationship at the 1% level, which shows that firm size impacts profitability for Shariah firms. Chandrapala and Knápková (2013) confirm that the ability of firms to create profits seems to be steadily increasing as the firm becomes larger. This is consistent with the resource-based theory whereby when a firm grows, it becomes easier to access additional financial resources, lowering its capital cost and increasing its profit. However, this research found an insignificant relationship between firm size and profitability for non-Shariah-compliant manufacturing firms. Furthermore, based on this research observes that firm size for all models has a positive coefficient on profitability. This indicates that when the firm size increases, the profitability of firms also increases. The findings in this research are consistent with Unal et al. (2017), Das et al. (2021), and Doğan (2013), who discovered a positive coefficient between the size of the firm and the profitability of the firm.

Next, this research also found a significant relationship between leverage and firms' profitability. The leverage is highly significant at the 1% level where it shows that leverage has a negative impact on profitability for Shariah and non-Shariah firms. This means that when the leverage increases, the profitability will decrease. The findings are in line with the pecking order concept, which maintains that high debt financing lowers a firm's value because debt carries an obligation for repayment and debt financiers prefer to avoid riskier undertakings. The use of a large amount of debt to finance a business not only increases its financial risk but also its liquidity risk and its operational risk. This research finding is also consistent with past studies, such as Mathur et al. (2021) and Ayaz et al. (2021), confirming a negative relationship between leverage and firm performance.

Tangibility is found to have a significant and negative relationship with firm performance. Model A is highly significant, with profitability at a 1% level. While in Model B and Model C, the tangibility is significant, with profitability at a 5% level. It indicates that tangibility impacts a firm's profitability for all models. According to Tariq Bhutta and Hasan (2013), firms are more profitable if they have a lower tangibility of assets because of lower commitment and costs in maintaining the assets. The negative coefficient between tangibility and the performance of firms is also supported by Zeitun and Saleh (2015). The researcher stated that sizable fixed assets could reduce a firm's performance. In addition, the researchers conclude that to overcome this situation, whether the investment in fixed assets should be reduced or the fixed assets should be used more effectively. The findings are in line with resource-based theory, in which businesses with internal resources are more likely to have a competitive advantage via the effective use of their strategic resources, which may serve as the basis for the growth of business skills that eventually result in better performance. In other words, if a firm has more fixed assets and uses them well, this will result in higher returns.

Working capital is found to be significant and positively related to the firm performance in Model A and Model C. The working capital in Model A is significant, with profitability at a 1% level, while Model C is significant at a 5% level. However, this research found an insignificant relationship between working capital and profitability for Shariah-compliant manufacturing firms. The reason is clear that managers of Shariah-compliant firms cannot enhance the firm profitability by optimizing working capital. To increase their business' profitability, managers must carefully manage their cash and accounts receivable (Sivathaasan et al., 2013; Dong & Su, 2010). The significant positive relationship may be explained by the fact that every firm has to control daily expenses to raise yield carefully. Therefore, the efficiency ratio should be increased. The findings are consistent with the agency theory because high working capital will increase shareholder and management conflict, raising agency costs. Managers will utilize their limited resources more profitably to lower agency costs (Alarussi & Alhaderi, 2018; Tareq et al., 2021; Sawarni et al., 2022).

The last significant determinant in the models is efficiency, which this research found all models to be significantly related to firm performance. The efficiency is highly significant at a 1% level and positively related to the firm's profitability. The result shows that efficiency is a major factor determining changes in Shariah and non-Shariah-compliant manufacturing firms. The reason is that efficiency is key to generating bigger revenues, and firms have the full capacity to manage their obligations and efficiently use their assets to produce short-term income. This result is consistent with the resource-based theory, which highlights that firms should efficiently use their resources to gain a competitive advantage since they are valuable, rare, difficult to duplicate, and cannot be replaced. Efficiency is necessary for firms to improve market performance, maintain competitiveness, and reduce their vulnerability to outside competition. These findings are consistent with the findings of Warrad & Omari (2015), Gaio & Henriques (2018) and Alarussi (2021).
Nevertheless, two independent variables are found to have an insignificant relationship with firm performance: liquidity and shariah compliance status. Perhaps, the reason is that a firm's success is not dependent on its cash base, and nonfinancial businesses do not have a significant need for liquidity in the same way that financial institutions do. The insignificance of the Shariah-compliant status suggests that the profitability of Sharia-compliant and non-Shariah-compliant firms' practices behave similarly.

5. Conclusion

The manufacturing industry in Malaysia is expected to continue playing an important part in developing the country's economy. Their contributions to Malaysia's export earnings and the generation of jobs ensured that the country would keep growing despite the instability of the global economy. The study investigates the relationship between the performance of Shariah and non-Shariah-compliant manufacturing firms in Malaysia from 2012 to 2021. The independent variables examined include firm size, liquidity, leverage, tangibility, working capital, efficiency, and Shariah-compliant status. The purpose of using all of these independent variables is to determine whether there is a significant impact on the performance of manufacturing firms in Malaysia. In this study, the researchers look at the significance and factors determining the relationship between manufacturing firm performances and independent variables.

Analyses and discussions of literature review on the firm's performance are carried out to get more knowledge on the factors that determine it. Different tests are carried out in advance of the data estimation to ensure the findings' reliability. According to this research findings, Model A, known as a Shariah and non-Shariah manufacturing firm,

shows that the firm size, leverage, tangibility, working capital, and efficiency all have a significant relationship with the performance of the firm. Related to the firm liquidity, the research did not successfully prove any significant relationship with the firm's performance. Model B, known as Shariah compliant firm, shows that firm size, leverage, tangibility and efficiency have a significant relationship with the firm's performance. In terms of both liquidity and working capital, the research could not identify any significant relationships to firm performance. The results for non-Shariah manufacturing firms (Model C) indicate that leverage, tangibility, working capital, and efficiency strongly affect firm performance. Except for firm size and liquidity, this study cannot find any significant relationship between the firm's performance.

The impacts of firm size, liquidity, leverage, tangibility, working capital, and efficiency on firm performance may be used to differentiate between Shariah-compliant and non-Shariah-compliant businesses. Conclusively, to check for the robustness of this research's results, this research makes a recommendation to future researchers. Since the scope of this study was limited to the performance of Shariah and non-Shariah firms in Malaysia, future research would be expected to conduct a comparative study with other countries that are also experiencing expansion in Islamic finance. This might provide helpful information for internal and external users in managing their firms.

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