

**LEVERAGING AND PROFITABILITY: A STUDY OF
PUBLIC COMPANIES IN THE CONTEXT OF AN
EMERGING ECONOMY**

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Abstract

Extant research on Financial Leverage and Capital Structure Policy has ignored emerging markets as research contexts. This study attempts to investigate the effects of debt and equity mix, as measured by financial leverage, on a firm's financial performance in an emerging market like Saudi Arabia. This study was developed to extend understandings in the literature of how financial leverage operates in a zero-interest financial system, and how it may affect financial performance. This research examined 57 publicly trading firms listed in the Saudi Arabian Stock Market between 2002 and 2010. It also extends the understandings previously reported in the literature of how financial performance is linked to financial structure, *zakat* and the ages and sizes of Saudi Arabian firms in a zero-interest financial system.

The overall results of this study were that, in the long term, in the absence of acute economic downturns, lower leverage levels tend to lead to higher profit margins and returns on both assets and equity. It also provides evidence to recommend that, under normal economic conditions, Saudi Arabian firms could attempt to improve their financial performance by balancing their zakat liabilities with their leverage borrowing levels. Another recommendation made by this study is that more studies are needed to examine zakat calculation standards and zakat's effect on firms' capital structure and society.

INTRODUCTION

The effect of debt and equity mix, as measured by financial leverage, on a firm's financial performance has always been a contentious topic for corporate financial economists. Despite some significant theories (Pecking Order Theory, Donaldson (1961), Myers (1984), Myers & Majluf (1984); Shareholder Theory, Berle & Means (1932), Friedman (1962); Trade-off Theory, Scott (1976), Copeland & Weston (1988), Kraus & Litzenberger (1973), Kim (1978); Agency theory, Jensen & Meckling (1976)) and propositions (MM Proposition I, Modigliani & Miller (1958)) of the various intricacies about capital structure mix, literature produced so far did not yet provide a clear picture of the characteristics that affect the choices between debt and equity in capital structure and the effect of this choice on financial performance.

Saudi Arabia, as an emerging market (CIA Factbook (2010)), is as attractive for researchers as for investors, as this market has the potential for rapid economic growth. Although many studies have been conducted and many authors such as like Gonzalez (2013), Fosu (2013) Jermias (2008) etc. have extended the international literature by their articles and special studies, investigating the direct relationship between leverage level and

performance, most of these studies have been conducted in developed markets. However, firms in Saudi Arabia are operating in a unique environment where interest on debt is prohibited. The tax required by the Saudi Government from Saudi Firms is low compared to taxes in Western Countries. Previous studies about the relationship between capital structure and financial performance have been built mainly on the tax shield and trade-off between the costs and benefits of using debt in a capital structure. All of these factors have motivated the researchers to conduct this study to form the basis of future studies about the effect of no-interest debt and low tax on firms' capital choice, and its subsequent effect on their financial performance.

This paper attempts to formulate a conclusion about the best balance between debt and equity that can be seen to improve corporate profit and performance. It is hoped that this study will sought to extend understandings in the literature about how financial leverage operates in a zero-interest financial system. Nevertheless, previous studies that tried to solve the leverage-performance puzzle continue to report mixed and often contradictory findings. Modigliani & Miller (1958) concluded that there is no relationship between firm's value and its choice of debt or equity. The trade-off theory (Scott (1976), Copeland & Weston (1988), Kraus & Litzenberger (1973), Kim (1978)) introduces the effect of assets on a firm's decision of choosing debt or equity to finance its operations. It suggests that a firm uses debt if it has a high amount of tangible assets and is able to choose equity if a significant portion of the firm's assets are intangible (Harris & Raviv (1991)). The pecking order theory (Donaldson (1961), Myers (1984), Myers & Majluf (1984)) predicts that high growth firms, typically with large financing needs, will end up with high debt ratios due to their managers' unwillingness to issue equity. A recent study by Charalambakis & Garrett (2010) showed that firms with high average tax tares prefer to issue debt to equity, and firms with a high probability of financial distress are less likely to issue debt.

This study examines 57 publicly traded firms listed in the Saudi Arabian Stock Market between 2002 and 2010. The data matrix consisted of 513 rows (57 firms X 9 years) and 10 columns for variables – firms, years (2002 to 2010), leverage (debt level), Net Profit Margins (NPM), Gross Profit Margins (GPM), Return on Assets (ROA), Return on Equity (ROE), *Zakat*, Age and Size. A more elaborate discussion of these variables is given in Data & Data Analysis section. In this study, we calculate the Saudi Arabian firms' capital structure mix indicators. This calculation includes the debt and equity percentage used in the capital structure and debt ratio to total assets i.e. leverage. We also calculate the financial performance of Saudi Arabian firms by using profitability indicator measurements – namely, GPM, NPM, ROA, and ROE.

The paper also tries to empirically examine the relationship between debt levels and financial performance (profitability), including determining whether a) higher financial performance levels are related to lower leverage levels, b) lower leverage levels lead to higher profit margins, c) lower leverage levels lead to higher GPM, d) lower leverage levels lead to higher ROA and e) lower leverage levels lead to higher ROE. Last but not the least, we also shed some light on the degree to which *zakat* is influenced by capital structure and the degree to which *zakat* affects financial performance.

This paper makes several important contributions to the existing literature. First, it extends our understandings of how financial performance is linked to financial structure, *zakat* and the ages and sizes of Saudi Arabian Firms in a zero-interest financial system. Second, a simple visual analysis of patterns in the time series data provided evidence to hypothesize that a lowering of the leverage levels may be associated with rising margins and returns on both assets and equity and vice-versa. These findings go consistent with the studies of Majumdar & Chhibber (1999) and Chiang, Chang & Hui (2002) who also found a negative relationship between high leverage and firm performance. Multilevel regression analysis, stratified by time, after controlling

for the age and size of firms, also revealed a statistically significant negative effect of leverage on financial performance on an annual basis, in line with the results provided by Zeitun & Tian (2007) and Abdullah (2005). The majority of previous findings in other parts of the world have identified a negative relationship between profitability and debt leverage like Titman & Wessels (1988), Rajan & Zingales (1995), Baker & Wurgler (2002) and Fama & French (2002). Third, the visual analysis of patterns in the time series data also provided evidence to indicate that *zakat* payments increased exponentially between 2001 and 2007. During this period, there was a general trend for leverage to increase. Lastly, the findings also provided evidence to conclude that both before and after the economic downturn at the end of the decade, there was potentially a significant effect of *zakat* on financial performance.

The remainder of this paper is organized as follows. Section 2 presents a review of the relevant theoretical literature and empirical evidence. Section 3 outlines the research hypothesis. Section 4 gives the details about data sampling and statistical approach used in the study. Section 5 provides detailed data analysis using descriptive statistics. Section 6 discusses the empirical results. The final Section 7 discusses the conclusion, limitations and future results implications in this area.

Literature Review

Although there is an abundance of research which aims to explain the influence of financial leverage on firms' financial performance, the literature remains unclear between the choices of debt and equity in capital structure and the effect of this choices on firms' financial performance.

Many studies have examined capital structure theories. However, these have failed to reach a single conclusion that can be generalized for all types of firms in all circumstances. Myers (2011) argued that there is no complete theory of the debt-equity choice, and no reason to expect a complete theory of debt-equity choice. Moreover, Briley & Myers (1991, p. 883), in their book

Principles of Corporate Finance, listed capital structure as one of the ‘ten unresolved problems in finance’.

The choice between debt and equity might differ from one firm to another based on each firm’s particular circumstances (Al-Ajmi, Abo Hussain & Al-Saleh (2009)). Companies can choose different fund sources. As Mazhar & Nasr (2010) stated, there are three primary sources of finance for companies: *a*) Cash surplus from operating activities (earnings); *b*) New equity funding; and *c*) Borrowing from bank and non-bank sources (debt). Martin and Scott (1974) stated that when making debt–equity decisions, firms tend to consider the seven general financial condition areas of leverage. These conditions are liquidity, profitability, dividends, market price, firm size, sales growth and sales variability. Another issue that firms consider when making their financial choices is the cost and benefits that can be generated from each financing method (Titman & Wessels (1988)). Martin and Scott (1974) found that high payout, low profitability and a high proportion of fixed assets all tend to indicate a debt issue.

An asymmetric information model developed by Ross (1977) stated that more profitable firms may face lower asymmetry costs when borrowing, thus are able to borrow more. However, other studies’ findings detect a negative relationship between profitability and debt leverage (Titman & Wessels (1988), Rajan & Zingales (1995), Baker & Wurgler (2002), Fama & French (2002)). In agreement with the pecking order theory, a study conducted by Faulkender and Petersen (2006) assumed that profitable firms are unwilling to use debt unless their internal funds are exhausted due to asymmetric information costs, thus lower leverage is expected.

Marsh (1982) conducted an empirical study of security issues by United Kingdom companies between 1959 and 1974. His study focused on how companies select between financing instruments at a given point in time. His study demonstrated that companies are heavily influenced by market conditions and the history of security prices when choosing between debt and equity. Marsh’s (1982) study provided evidence of the influence of

company size, bankruptcy risk and asset composition on target debt levels.

Hovakimian, Opler and Titman (2001) tested the hypothesis that ‘firms tend to move toward a target debt ratio when they either raise new capital or retire or repurchase existing capital’. Most of their ideas about capital structure choice come from the trade-off theory, which suggests that there is a trade-off between the costs and benefits of debt and equity financing. The static trade-off theory states that when a company tends to maximize its values, it will expand the use of debt in its capital structure. This is because the interest expense is tax deductible.

These studies reveal the effects of firms’ characteristics—such as assets structure, size and profitability—on the choice of debt–equity instruments. Firms with high profit and strong financial positions are expected to issue more debt than equity. Market circumstances and tax issues influence choices of financial instruments. With the benefits of a tax shield, firms prefer to use debt rather than issue more equity. However, this tax shield might be diminished by the high rate of interest for debt. Moreover, when the market overvalues the firm share price, managers may tend to issue more equity than debt. Moreover, as the pecking order theory suggests, firms with high liquidity will depend more on their internal funding and less on debt. Hence, firms with high liquidity seem to have lower leverage

Research Hypothesis. The trade-off theory suggests that the biggest advantage of using debt is the tax savings that will be achieved. This advantage can be offset by the very low tax (*zakat*) applied to Saudi Arabian companies, which does not exceed 2.5 per cent of net worth. Moreover, investors in Saudi Arabia are forbidden from investing in companies that have a debt ratio higher than 33 per cent (Al-Ajmi, Abo Hussain & Al-Saleh (2009)). Figure 1 shows the normal distribution of the debt ratio of 74 companies in the Saudi Arabian stock market in 2009. The mean of debt to total assets is approximately 0.31.

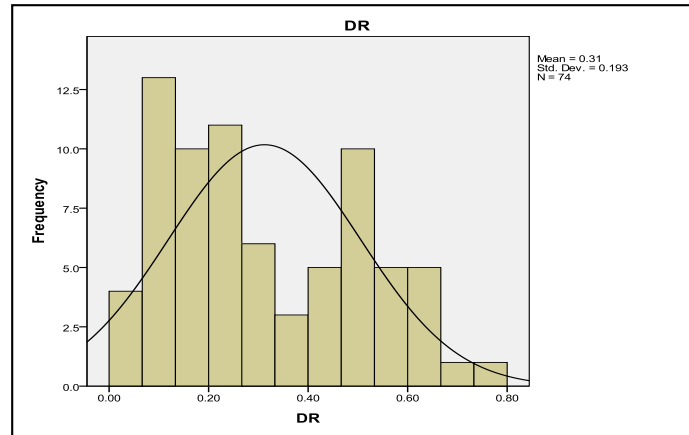


Figure 1 Debt Ratios of Saudi Arabian Firms 2009

Therefore, the hypotheses developed for this study will consider the expected low debt ratio and how this reflects on firms' financial performance in Saudi Arabia. The hypotheses will also reflect the low tax situation that characterizes the Saudi Arabian economic system.

Capital Structure Effects

Capital structure theories mainly focus on the expenses and risks associated with the choice of capital structure. The aim is to reduce the risks associated with capital structure choice and choose the optimal one to help improve firms' values. However, the theoretical relationship between financial performance and financial leverage is confusing. Modigliani and Miller (1958) concluded that capital structure is irrelevant to determining firm value. However, theories developed after the MM propositions overturned this theory.

The pecking order theory (Donaldson (1961)) concludes that management strongly prefers to use internal funds when available, and does not use an external source of funds unless internal resources are unavailable. Myers (1984) and Myers and Majluf (1984) provided a theoretical justification of Donaldson's

results. They stated that firms prefer to finance new investment first internally with retained earnings, second with debt, and last with an issue of new equity. The theory predicts that high growth firms, typically with large financing needs, will end up with high debt ratios due to managers' unwillingness to issue equity. However, Barclay, Smith and Morellec (2006) found that firms with high growth consistently use less debt in their capital structures. According to the explanation of pecking order theory, it is expected that firms with high liquidity will tend to use less debt because they are willing to use internal funds if they are available.

Kraus and Litzenberger (1973) developed a model of optimal financial leverage. This theory concluded that optimal capital structure comes from balancing the benefits of tax from using debt against the costs associated with debt, such as bankruptcy or financial distress (Scott (1976), Kim (1978)). The trade-off theory suggests that an optimal capital structure exists and that a firm can predict its optimal capital structure by balancing the benefits and costs associated with issuing debt. In a market where tax is expected to be very low, the cost of issuing more debt will exceed the associated tax benefits. Hence, in this scenario, an optimal capital structure will have low debt and higher equity.

Most research regarding capital structure has been undertaken in the Western economic environment, where debt can offer tax-shield benefits to firms. The hypotheses listed in the following sections have been developed to test the validity of the above studies and theories in the Saudi Arabian environment, where tax-shield benefits are expected to be low.

Hypothesis 1 states:

H1: A firm's financial performance tends to increase with any decrease in leverage scale.

Zakat Effects

A tax shield is a benefit of using more debt in the capital structure mix. The absence of income tax on citizens is one of the basic features of the Saudi Arabian economy (Al-Sakran (2001)).

In general, zakat is based on an individual or company's net worth. Saudi Arabian individuals or nationals of GCC states who conduct business in Saudi Arabia in commercial goods are subject to zakat. Also affected are Saudi companies and companies owned by nationals of GCC states that conduct business in Saudi Arabia, all shares of Saudis, and nationals of GCC states who participate in joint companies in Saudi Arabia.

As aforementioned, the trade-off theory states that suitable capital is based on the way firms balance capital structure component costs successfully. This can be achieved by creating a balance between the tax savings that arise from debt, thus decreasing agency costs, bankruptcy threats and financial distress (Ayen & Oruas (2008)). The benefits of maximizing a firm's value can be traded for the cost of issuing debt. Saudi Arabia's tax system maintains its own identity with respect to zakat and taxes. The tax system in Saudi Arabia maintains an influence on the trade-off theory.

In his study of leverage determinants in the absence of the corporate tax system in Saudi Arabia, Al-Sakran (2001) stated that zakat makes no difference if financing uses equity or debt, since both are included in the zakat base. He added that the effect of interest payments on loans, if any, would be small because it is deducted from income, which is included in the zakat base. Hence, the effect of zakat on financial performance is small and insignificant. The following hypotheses were developed to test these propositions:

Hypothesis 2 states:

H2: There is a relationship between capital structure and zakat.

Hypothesis 3 states:

H3: There is a relationship between zakat and financial performance.

Data Sampling & Statistical Approach. The main aim of this study is to investigate the effect of financial structure, i.e. debt and equity mix, on the financial performance, i.e. NPM, ROA and ROE. We selected 57 publicly traded firms listed in the Saudi

Arabian Stock Market over the period 2002 - 2010. Most of the data were collected from the Saudi Arabian Stock Market ([Tadawul](#)) website. For the data of initial years, i.e. from 2002 to 2005, which was missing on Tadawul website for many of the firms, were collected from the websites of the firms itself. A data collection template was developed to assist the process of collecting data. Table 1 shows the summary results of the data collection process for each year.

As can be seen from Table 1, the data sample consisted of 531 cases (57 firms x 9 years) for 13 sectors. The sectors included in this study were: a) Petrochemical industries; b) Cement; c) Retail; d) Energy and utilities; e) Agriculture and food industries; f) Telecommunication and IT; g) Multi-investment; h) Industrial investment; i) Building and construction; j) Real estate development; k) Transport; l) Media and publishing; and m) Hotels and tourism.

As reported in the above sections, the data matrix consisted of 513 cases (57 firms x 9 years) in the rows, and 10 variables - firms, years (2002 to 2010), leverage (debt level), GPM, NPM, ROA, ROE, zakat, age (years) and size (logarithm of sales)—in the columns. Table 2 summarizes the variables' components and measurements.

Independent Variable (Financial Leverage and Zakat)

Rajan and Zingales (1995) offered one of the most important empirical studies to analyze leverage and its determinants. Prior studies focused on the debt–total assets ratio as an acceptable measure of financial leverage (Ebaid (2009), Zeitun & Tian (2007), Abor (2005), Abdullah (2005)). Such studies applied three measures of financial leverage: short-term debt to total assets, long-term debt to total assets and total debt to total assets.

Given the observed differences in measuring leverage, and in order to follow the aims of this thesis, this study used total debt to total assets as a measure of financial leverage. This offered a complex view of how greatly firms depend on debt to finance their assets. Similarly, this study focused on total debt rather than short-

term debt or long-term debt in order to follow the principal aim of this research, which focused on total liabilities in general. Zakat is presented in income statements as a tax item. Therefore, this study used the logarithm of actual zakat amount as a measurement of this variable.

Dependent Variables (ROA, ROE, GPM, NPM)

Given the observed differences in the composition of financial performance measurement, it is clear that ROA and ROE have been used most frequently as performance measures in prior studies (Ebaid (2009), Krishnan & Moyer (1997), Zeitun & Tian (2007), Sanda, Garba & Mikailu (2008)). Collier, McGowan and Muhammad (2010) depended upon the DuPont system of financial analysis for their evaluation of banks' financial performance. The DuPont system is known as the 'ROE model', which divides performance into three components to determine ROE. These components include NPM, total asset turnover and equity multiplier. The profit margin allows financial analysts to evaluate income statements and their components. The total asset turnover allows financial analysts to evaluate the left side of the balance sheet, which comprises the asset accounts. The equity multiplier allows financial analysts to evaluate the right side of the balance sheet, which includes liabilities and owner's equity.

Following the thesis objectives, this study used the most acceptable financial performance measurements of ROA, ROE, GPM and NPM. These measurements helped evaluate income statements, as well as the left and right sides of the balance sheet. Moreover, ROE is a primary concern for many firms, while also offering an acceptable measurement of financial performance. Assets turnover was used in this study as a measurement of financial efficiency.

Controlled Variables (Size, Age)

Previous studies have suggested that firm size and age can influence financial performance. Hence, size and age variables were included in this study's models. A firm's size can be

measured by the natural logarithm of total assets (Abdullah (2005)). Age can be measured by the numbers of years that firms have been operating. Age is equal to the present year minus the year of foundation. These two variables can be expressed by the following equations:

$$\text{Size} = \log \text{total assets} \text{ ---- eq. (1)}$$

$$\text{Age} = (\text{present year} - \text{year of foundation} \text{ ---- eq. (2)})$$

Statistical Approach

In this study, different types of descriptive and inferential statistics were used, including simple statistical techniques, such as the number of cases; minimum, maximum and mean; factors analysis; standard deviation; and analysis of variance (ANOVA & MANOVA), with the help of the Statistical Package for the Social Sciences (SPSS).

Hair et al. (2010) stated that ‘as statistical inference procedure, both the univariate techniques (t-test and ANOVA) and their multivariate extensions (Hotelling’s T^2 and MANOVA) are used to assess the statistical significance of differences between groups’. MANOVA was used to analyze data for decades in different sciences and studies (Anderson (2001)). For example, Hotelling (1931), Wilks (1932), Fisher (1936), Bartlett (1939), Lawley (1939) and Pillai (1955). This study involved many variables and groups that are needed to be examined, as there was more than one dependent variable (GPM, NPM, ROA and ROE). Therefore, MANOVA was adapted to test some hypotheses.

Another important part of the analysis used the multilevel linear regression analysis. This was used because the variables in this study had multilevel characteristics. A time series analysis described the annual changes in the mean leverage, financial performance, age, size and zakat of the 57 firms at yearly intervals from 2002 to 2010. The patterns in the time series data provided evidence to hypothesize that a change in the leverage levels may be associated with a change in profit margins and returns on both assets and equity. Descriptive statistics and error bar charts (means and 95 per cent confidence intervals) were used to summarize the

relationships between leverage levels, financial performance indicators and zakat.

Hypotheses relating financial performance to financial structure were tested using MANOVA. The aim was to determine if the mean values of the four inter-correlated financial performance indices (GPM, NPM, ROA and ROE) varied significantly with respect to eight ordinal levels of leverage. Hypotheses concerning the relationships between leverage and zakat were tested by ANOVA. The aim was to determine if the mean zakat varied significantly with respect to eight ordinal levels of leverage.

Factor analysis based on principal components was used to combine the four inter-correlated financial performance indicators (GPM, NPM, ROA and ROE) into one factor. Hypotheses concerning the relationships between the financial performance factor, financial structure, age and size were tested by multilevel linear regression analysis. Nine equations, with regression coefficients stratified across nine years between 2002 and 2010, were constructed, using four independent variables for each equation. The general form of each equation was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \quad \text{where,}$$

Y = predicted average value of the financial performance factor;

β_0 = intercept; $X_1 = \sqrt{\text{Leverage}}$; $X_2 = \text{size}$; $X_3 = \log_{10} \text{age}$; $X_4 = \log_{10} \text{zakat}$;

β_1 to β_4 = standardized regression coefficients for X_1 to X_4 , respectively;

ε = residual error.

The patterns in the standardized regression coefficients over time revealed the effects of zakat and leverage on financial performance on an annual basis, controlling for the effects of age and size. The relationships between financial performance, zakat and leverage were interpreted to determine that Saudi Arabian firms could attempt to improve their financial performance by balancing their zakat liabilities and leverage borrowing levels.

Data Analysis Using Descriptive Statistics.

Screening, Cleaning and Transformation of Data

All the data analysis was performed in SPSS using the protocols described by Field (2009). All the variables were very carefully screened for missing or erroneous values to ensure they were ready to be entered for analysing. The descriptive statistics for the original data are presented in Table 3. The skewness statistics and p-values obtained using Kolmogorov-Smirnov tests for normality are also provided. All the variables were either positively or negatively skewed. The Kolmogorov-Smirnov tests indicated that six of the variables, i.e. leverage, GPM, NPM, ROA, *zakat* and age, deviated from normality ($p < 0.001$).

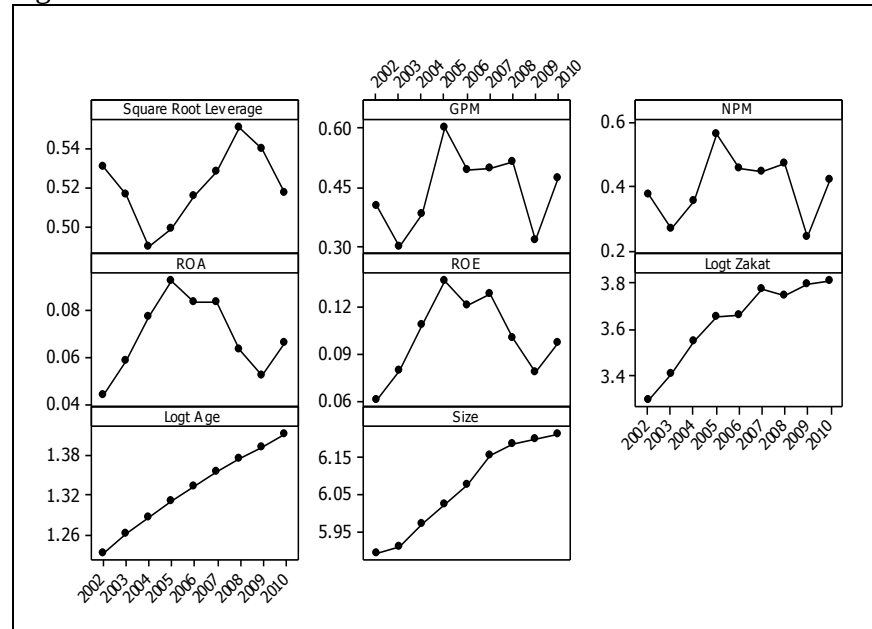
Standard Deviation (SD) for each variable were computed to identify univariate outliers (extreme values that were not contiguous with normal frequency distributions, representing unusual cases that were not representative of the 57 companies as a whole). SD values outside the expected normal limits of ± 3.0 were considered to represent outliers. As variables containing outliers associated with high levels of skewness may at best compromise the results of inferential parametric statistics, and at worst render the results meaningless, the conventional cleaning procedure recommended by Hair et al. (2010) was conducted. The data were cleaned by excluding outliers, and the variables were normalised by transformation.

Recognisable transcription errors, such as -1,976 for age, were eliminated. The descriptive, skewness and normality statistics for the screened, cleaned and transformed data are presented in Table 4. After excluding erroneous values/outliers, transforming leverage by square roots, and transforming *zakat* and age by logarithms ($\log_{10}$), all of the variables were normally distributed, indicated by $p \geq 0.001$ for the Kolmogorov-Smirnov statistics. Consequently, it was justified to perform parametric inferential statistics using the cleaned, screened and transformed variables.

Descriptive Analysis

The time series of mean values, in Figure 2, indicates that the mean ages and sizes of the companies increased over time. *Zakat* increased between 2002 and 2008, but stabilised between 2008 and 2010, when leverage was high and financial performance was low. The mean leverages declined between 2002 and 2004, followed by an increase until 2008, and thereafter another decrease. The mean profit margins (GPM and NPM) declined between 2002 and 2003, increased between 2004 and 2007, and declined after 2008. The ROA and ROE tended to increase between 2002 and 2005, when leverage was declining, but decreased between 2005 and 2008, when leverage was increasing. The patterns in the time series data provided evidence to hypothesise that a lowering of the leverage levels may be associated with rising profit margins and returns on both assets and equity, whereas a rising of the leverage levels may be associated with a lowering of profit margins and returns.

Figure 2. Time Series of Leverage, Performance Indicators, Zakat, Age and Size



Test of H_{01} : High Financial Performance is Not Significantly Related to Lower Capital Structure

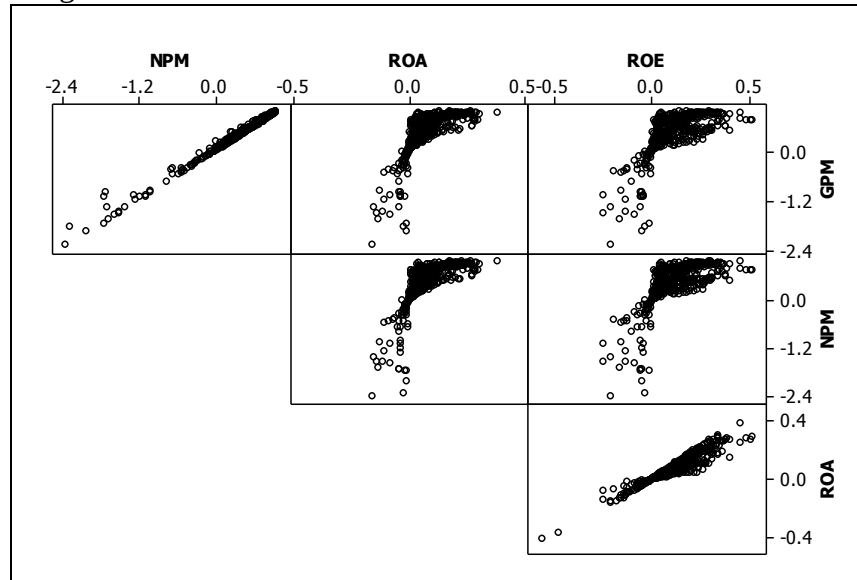
The formal hypotheses (H_0) and alternative hypotheses (H_A) concerning the relationships between mean financial performance and financial structure previously identified in Figure 2 are listed in Table 5. The dependent and independent variables and the inferential statistics used to test the hypotheses are also summarised.

To test the hypotheses, it was necessary to break down the continuous leverage values into eight ordinal levels, with a class interval of 0.100 between each successive level. To simplify the analysis, time was not included as an independent variable. The repeated measures collected annually from 2002 to 2010 were temporally pseudo-replicated. Consequently, the variability in

financial performance caused by time was not separated from the variability caused by leverage. This could be justified because the eight leverage levels were not significantly correlated with time (years), indicated by Spearman's rank correlation analysis (Spearman $r_s = 0.041$, $p = 0.357$).

The hypotheses were tested using MANOVA to determine if the mean values of the four financial performance indices (GPM, NPM, ROA and ROE) varied significantly with respect to the eight ordinal levels of leverage. The MANOVA simultaneously incorporated all four dependent variables. This approach was justified only if the four financial performance indices were positively correlated each other (Hair et al. (2010)). The relationships between the four variables are visualised with a matrix of scatter plots in Figure 3. The strengths of the correlations were measured using Pearson's r coefficients (Table 6). All the correlation coefficients between the four financial performance indicators (Pearson's $r = 0.685$ to 0.994) were statistically significant at $\alpha = 0.05$, thus implying that MANOVA was justified. The MANOVA statistics are presented in Table 7 and 8.

Figure 3. Matrix Plot between Financial Performance Indicators

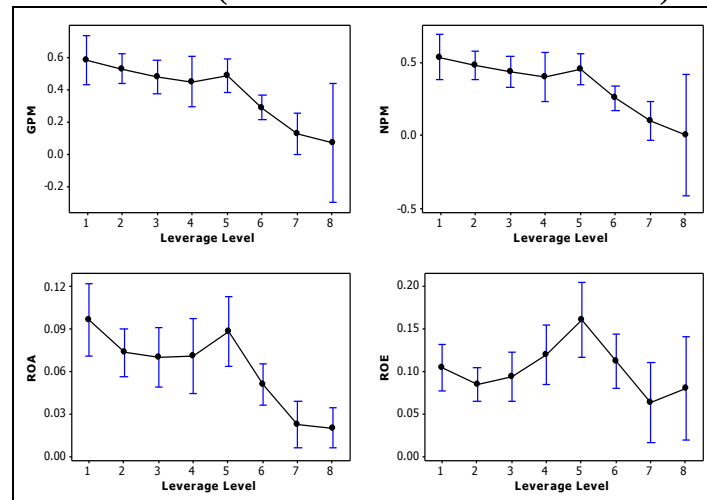


The MANOVA model was statistically significant, indicated by $p < 0.001$ for the Wilk's λ and multivariate F statistics. The null hypothesis was rejected at the prescribed significance level of $\alpha = 0.05$, with respect to all four of the financial performance indicators. Rejection of the null hypothesis was indicated by $p < 0.05$ for the F statistics. Leverage was found to have a statistically significant, but relatively small, effect on all four dimensions of financial performance, indicated by the magnitudes of the *eta squared* values ($\eta^2 = 0.036$ to 0.073).

The direction of these effects is described using descriptive statistics in Table 9 and graphs in Figure 4. Generally, there was a negative relationship between financial performance and capital structure. The general pattern was for the mean financial performance indicators to decline with respect to leverage. However, the relationships were not linear. Below a leverage level of five, the mean GPM, NPM and ROA remained relatively constant, although the ROE tended to increase. The cut-off point, above which the mean financial performance tended to decrease,

was a level of five, corresponding to a leverage of approximately 0.400.

Figure 4. Relationships between Leverage Levels and Financial Performance Indicators
(Mean $\pm$ 95% Confidence Intervals)



Test of H_{02} : There is No Significant Relationship between Capital Structure and Zakat

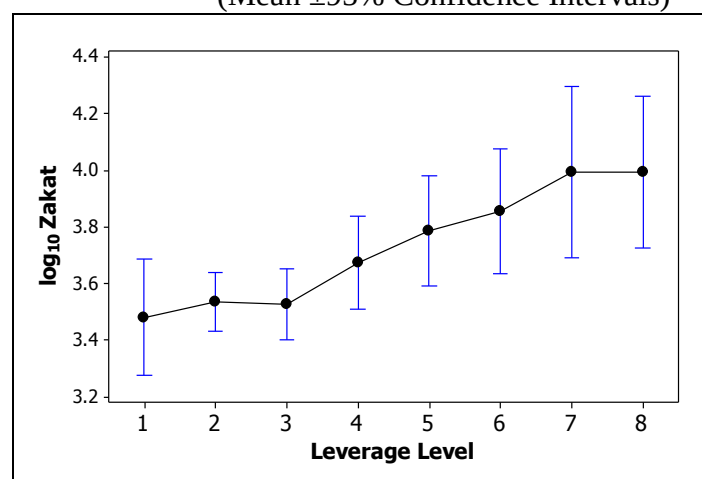
The formal null hypothesis (H_0) and alternative hypothesis (H_A) concerning the relationship between capital structure and *zakat* are listed Table 10. The statistics could not separate the variability in *zakat* caused by time from the variability caused by leverage.

The null hypothesis was tested by univariate ANOVA to determine if *zakat* varied significantly with respect to the eight ordinal levels of leverage. The null hypothesis was rejected at $\alpha = 0.05$, indicated by $p < 0.001$ for the F statistic (Table 11). Leverage was found to have a statistically significant, but relatively small, effect on *zakat*, indicated by $\eta^2 = 0.058$. The direction of this effect

is demonstrated using descriptive statistics in Table 12 and a graph in Figure 5.

The mean *zakat* values tended to remain relatively constant between leverage levels one to three. The mean values then systematically increased with respect to leverage levels four to seven, but remained relatively constant between levels seven and eight.

Figure 5. Graph of the Relationship between Log₁₀ Zakat and Leverage Levels
(Mean $\pm$ 95% Confidence Intervals)



Test of H03: Leverage, Size, Age and Zakat are Not Significant Predictors of Financial Performance of Each Firm in Each Year

The formal null hypothesis (H_0) and alternative hypothesis (H_A) concerning the relationships between financial performance, leverage, size, age and *zakat* are presented in Table 13.

As dependent variables were very strongly inter-correlated which is indicated by the high Pearson's r coefficients in Table 6, it was possible to combine the four financial performance indicators into one composite variable, or unidimensional factor, by using principal components factor analysis (Hair et al. (2010)). The first principal component, with an Eigen value of 3.337,

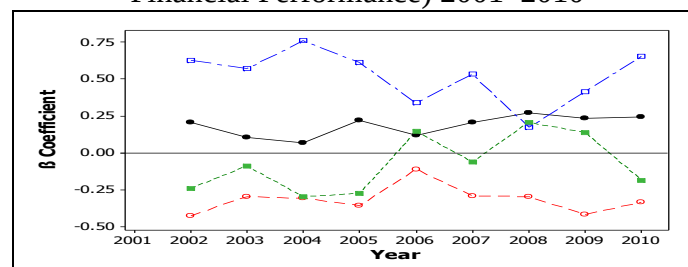
explained most (84.4 per cent) of the variance in financial performance (Table 14 and 15). The factor loadings (that is, the correlation coefficients between each financial performance and the factor) were very strong (0.899 to 0.928). Consequently, factor analysis was justified to condense the four individual dimensions of financial performance, measured using GPM, NPM, ROA and ROE, into one dimension. One set of principal component scores could be defensibly used as a valid and reliable substitute for the four sets of GPM, NPM, ROA and ROE values.

A multilevel linear regression analysis was performed to construct nine equations, with regression coefficients for each of the nine years between 2002 and 2010, using five independent variables for each equation as explained above. The null hypothesis that an equation did not explain a significant proportion of the variance was rejected if $p < 0.05$ for the R^2 value. The null hypothesis that a β coefficient was not significantly different from zero was rejected if $p < 0.05$ for the t-test statistic. These inferences could be compromised by collinearity (that is, strong inter-correlation between the independent variables), which inflates the SDs. Collinearity was indicated if the variance inflation factor (VIF) was > 5.0 . The statistics are presented in Table 16.

The R^2 values, all of which were statistically significant at $\alpha = 0.05$, ranged from 19.4 per cent to 41.2 per cent, reflecting moderately strong effect sizes each year. The negative β coefficients with p-values < 0.05 indicated that the financial performance factor decreased significantly with respect to leverage every year, except 2006. The β coefficients for size were sometimes negative, and sometimes positive, but none were statistically significant at $\alpha = 0.05$; consequently, financial performance did not decrease or increase significantly with respect to size. Similarly, age was not a significant predictor of financial performance, except in 2010, when the p-value was marginally below 0.05. The positive and statistically significant β coefficients for *zakat* indicated that the financial performance factor consistently increased with respect to an increase in *zakat*, except in 2006.

The time varying fluctuations in the β coefficients between 2002 and 2010 are illustrated in Figure 6. While the β coefficients for *zakat* tended to decline between 2001 and 2008, the β coefficients for leverage tended to increase. After 2008, *zakat* increased, while leverage declined. The relationship between *zakat* and financial performance was the inverse of that between leverage and financial performance. The largest β coefficients were generally for *zakat*, implying that *zakat* was a relatively stronger positive predictor of financial performance than leverage was a negative predictor. Between 2001 and 2008, there was a general trend for the strength of the positive relationships between financial performance and *zakat* to decrease (the β coefficients became lower) and for the negative relationships between financial performance and leverage to become weaker (the β coefficients became less negative). However, after 2008, the strength of the positive correlation between *zakat* and financial performance increased, and the strength of the negative correlation between financial performance and leverage at the same time became more negative.

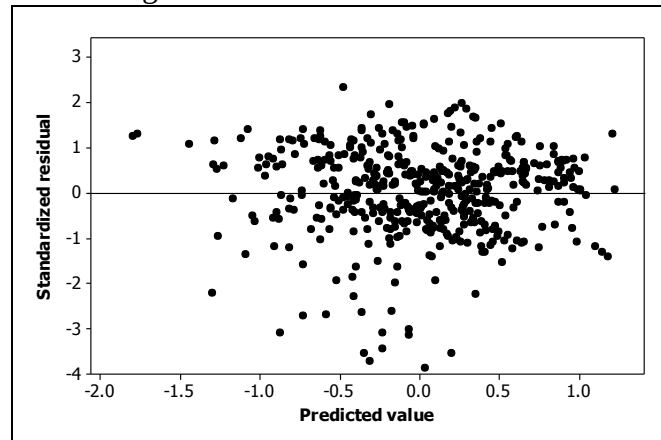
Figure 6. Graph of the Changes in β Coefficients
(Representing the Relative Importance of each Predictor of
Financial Performance) 2001–2010



Diagnostic checks indicated that the theoretical assumptions were not violated. The VIF statistics were less than 5.0, reflecting limited collinearity between the independent variables. The residuals were relatively evenly scattered around their mean (zero), implying that the variance was approximately homogeneous, and the bell-shaped frequency distribution indicated

that the residuals were approximately normal (Figure 7). The regression equation was a good fit to the data and a valid predictor of financial performance between 2002 and 2010.

Figure 7. Distributions of Residuals



Results & Discussions

Relationship between Capital Structure and Financial Performance

A simple visual analysis of the patterns in the time series data provided evidence to hypothesise that a lowering of the leverage levels may be associated with rising profit margins and returns on both assets and equity and vice-versa. The use of MANOVA, incorporating GPM, NPM, ROA and ROE as inter-correlated dependent variables, and eight ordinal levels of leverage as independent variables, provided evidence to reject the null hypothesis that variability in financial performance is not related to leverage. When the effect of time was neglected, lower leverage levels below 0.400 tended to lead to higher profit margins and higher returns on both assets and equity. In contrast, progressively higher leverage levels above 0.400 tended to lead to progressively lower profit margins and lower returns on both assets and equity. Leverage was found to have a statistically significant, but

relatively small, effect on all four dimensions of financial performance, indicated by the low effect sizes ($\eta^2 = 0.036$ to 0.073). This interpretation follows Ferguson's (2009) recommendation in which $\eta^2 = 0.04$ indicates a minimal effect, $\eta^2 = 0.25$ indicates a moderate effect, and $\eta^2 = 0.64$ indicates a strong effect.

Multilevel regression analysis, stratified by time, after controlling for the age and size of the firms, also revealed a statistically significant negative effect of leverage on financial performance on an annual basis. The effect sizes were moderate, ranging from $R^2 = 19.4$ per cent to 41.2 per cent. The negative β coefficients, ranging from a maximum of -0.425 in 2002 to a minimum of -0.111 in 2006, predicted that, across the 57 firms, the average financial performance decreased significantly with respect to an increase in leverage every year from 2001 to 2010, with the exception of 2006. A potential reason for 2006 being an exceptional year was that it coincided with the Saudi Arabian stock market collapse. After 2008, the relationships between financial performance and leverage tended to change—a possible reflection of the GFC. However, the overall conclusion is that, in the long term, in the absence of acute economic downturns, lower leverage levels tend to lead to higher profit margins and returns on both assets and equity. Moreover, a level leverage of 0.4 is a suitable leverage level to help to reduce borrowing and debt risks, and increase firms' profitability opportunities.

Relationship between Zakat and Capital Structure

A simple visual analysis of the patterns in the time series data provided evidence to indicate that *zakat* payments increased exponentially between 2001 and 2007 (that is, $\log_{10}$ *zakat* over time was approximately linear). During this period, there was a general trend for leverage to increase. However, between 2008 and 2010—potentially associated with the Saudi Arabian stock market crash and the GFC—*zakat* stabilised, and the trend was for leverage to decline.

The use of univariate ANOVA, incorporating *zakat* as the dependent variable, and eight ordinal levels of leverage as independent variables, provided evidence to reject the null hypothesis that the variability in *zakat* is not related to leverage. When the effect of time was neglected, leverage was found to have a statistically significant, but relatively small, effect on *zakat* ($\eta^2 = 0.058$). The relationship between *zakat* and capital structure was non-linear. The mean *zakat* values tended to remain relatively constant when the leverage was less than 0.300, but increased exponentially when the leverage increased from 0.3 to 0.6. Above a leverage of approximately 0.6, the mean *zakat* remained relatively constant. These findings provide evidence to conclude that higher leverage levels are associated with a higher level of *zakat*. The threshold level, above which *zakat* tended to increase, was approximately 0.3 to 0.4.

The Effect of Zakat on Financial Performance

Multilevel regression analysis produced an equation that was a good fit to the data and a valid predictor of financial performance between 2002 and 2010. This equation, stratified by time, predicted that *zakat*, after controlling for the age and size of the companies, had a positive effect on financial performance on an annual basis. The positive β coefficients, ranging from a maximum of 0.760 in 2003 to a minimum of 0.173 in 2008, predicted that, across the 57 companies, the average financial performance increased significantly with respect to an increase in *zakat* every year from 2001 to 2010, with the exception of 2008. Between 2002 and 2008, there was a general trend for the strength of the positive relationship between financial performance and *zakat*, indicated by lower β coefficients, to decline. However, after 2008, the relationships between financial performance and *zakat* appeared to become stronger, indicated by higher β coefficients. A potential reason for 2008 being an exceptional year was that it coincided with the GFC. These findings provide evidence to conclude that both before and after the economic downturn at the

end of the decade, there was potentially a significant effect of *zakat* on financial performance.

Conclusions, Limitations & Implications for Future Research

Conclusions

First, the results of this study were consistent with the conclusion that there is a relationship between capital structure and capital performance in Saudi Arabian firms. On average, the mean financial performance of 57 firms tended to increase with respect to a decrease in leverage level. Lower leverage levels were found to be linked with higher gross profit margins, NPM, ROA and ROE.

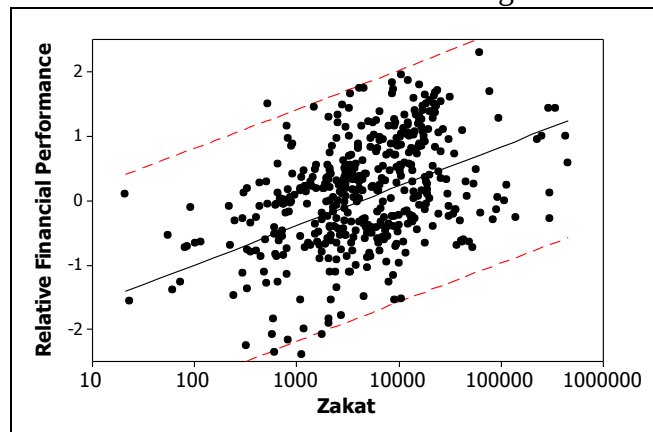
Second, the results of this study were also consistent with the conclusion that there is a relationship between capital structure and *zakat*. On average, the mean *zakat* payments of 57 firms tended to remain relatively constant below a leverage of approximately 0.3 (the approximate average among Saudi Arabian firms). The mean *zakat* then systematically increased with respect to increasing leverage, and stabilised above a level of approximately 0.6 to 0.7.

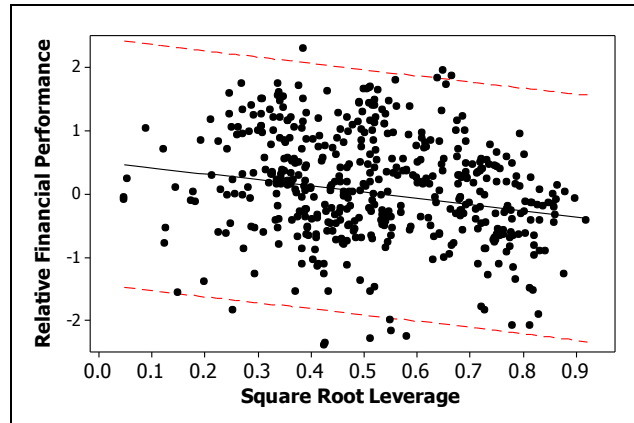
And third, the results of this study were consistent with the conceptual framework that posited that capital structure predicts *zakat*; *zakat* predicts financial performance; and both leverage and *zakat*, controlling for the size and age of the firms, predict the average financial performance (a mathematical combination of GPM, NPM, ROA and ROE). The evidence for this statement is that a multilevel regression model predicted that, when controlling for size, age and leverage, the average financial performance of 57 Saudi Arabian firms increased significantly with respect to an increase in *zakat*, every year from 2001 to 2010, with the exception of 2008, which was possibly due to the GFC. The largest β coefficients were generally for *zakat*, implying that

zakat is a relatively stronger positive predictor of financial performance than leverage is a negative predictor. The only exceptions to this rule were in 2006 and after 2008, which was probably associated with the Saudi Arabian stock market crash, and the GFC, respectively.

One of the aims of this study was to formulate a conclusion about the best balance between debt and equity to improve corporate profit performance. The findings of this study provide evidence to recommend that, under normal economic conditions, Saudi Arabian firms could attempt to improve their financial performance by balancing their *zakat* liabilities with their leverage borrowing levels. Figure 7, based on the results of this study, are provided to help Saudi Arabian firms achieve such an outcome.

Figure 7 Prediction of Relative Financial Performance from Zakat and Leverage





Limitations

This study involved the inferential statistical analysis of economic data collected annually over a period of nine years. The results were based on a set of normalised variables from which extreme values (outliers) were excluded. Consequently, the results only applied to those firms whose financial performance and financial structure conformed to normal expectations, and those that could be represented in terms of mean values, SDs and 95 per cent confidence intervals. The results did not apply to those firms with a financial structure and/or performance exceptionally outside the norm.

The fundamental theoretical assumptions that underpinned the inferential statistics used in this study were that all of the replicate measures that contributed towards the mean values were independent and randomly sampled from a known population. However, the values measured in this study were neither independent nor random. Each annual measure of financial performance and/or financial structure may have depended on the values collected in one or more previous years, and may also have determined the values in one or more future years. The comparison of mean values computed from time series data, known as temporal pseudo-replication, is criticised by some statisticians (Freeburg & Lucas (2009)). Nevertheless, many researchers who

collect variables at intervals over a long period generally ignore the assumptions of independent random sampling for practical reasons (Heffner, Butler & Reilly (1996)). In the current study, temporal pseudo-replication was unavoidable, for practical reasons, in order to relate the mean levels of financial performance to *zakat* and different levels of leverage as simply as possible.

Another limitation of this study is that it is incorrect to assume that the statistics and p-values used to test the null hypotheses can be used to answer the question, 'How meaningful are the results?' According to Kline (2004), in practice, statistics and p-values only answer the question, 'Assuming that the sample(s) represent the target populations, then what is the probability that chance factors were responsible for the results?' It is a commonly held misconception that rejecting a null hypothesis at $p < 0.05$ implies meaningfulness and importance and gives credibility to the data, and that the lower the p-value, the more useful the results.

Implications for Future Research

The first recommendation that can be made from this study is that further studies about *zakat* are needed to examine *zakat's* calculation standards and effect on firms' capital structure and on society. The way *zakat* is calculated and presented in firms' financial statements is vague. The template provided by the DZIT can be helpful to identify the components of *zakat*.

Statistical analysis of one set of data does not necessarily provide justification for predicting that repeating the same analysis on another set of data collected from other places at other times will result in the same outcomes. Only by measuring and demonstrating a phenomenon repeatedly can a researcher guarantee that it is a valid and reliable finding and not merely an accident of sampling (Allen & Yen (2002)). Thus, the results of this study are not considered definitive, and this study's second recommendation is that these results need to be confirmed by further research and economic analysis.

In this study, a relatively simple descriptive analysis of the time series data was performed to describe the underlying trends, patterns and turning points in the variables and their inter-relationships over time, using mean values of 57 firms. This study's third recommendation is that a more comprehensive time series analyses should be conducted, based on individual firms and/or groups of firms classified according to their different sectors. The statistical techniques could include:

- Spectral analysis (to identify systematic cyclic trends in financial performance and structure over time);
- Forecasting (to construct a time series model that predicts future events);
- Intervention analysis (to examine whether there is a significant change in financial performance and structure before and after a specified event, such as the 2006 Saudi Arabian stock market collapse and the 2008 GFC; and
- Explanative analysis, including cross-correlations (to explore the statistical relationships between related sets of financial performance and structure data collected in different years)

The fourth recommendation is to explore the potential cause and effect relationships between financial performance and structure that may manifest in time series data. Granger (1988) suggested that if the values of a past set of time series data can be used to predict the values of a future set of data, then the past set can be assumed to be the cause of the future set.

Table 1 Data Collection Summary

Sectors	Numbers of Companies Available for Each Sector Each Year								
	2010	2009	2008	2007	2006	2005	2004	2003	2002
1	14	14	12	10	7	7	6	6	5
2	8	8	8	8	8	8	8	8	8
3	9	8	7	6	4	4	4	4	4
4	2	2	2	2	2	2	2	2	2
5	13	12	11	11	11	11	11	11	11

6	4	3	2	2	2	2	1	1	1
7	7	7	6	6	6	6	6	6	4
8	12	11	8	8	6	6	6	6	6
9	13	12	12	9	7	7	7	7	7
10	6	6	6	4	3	3	3	3	3
11	4	4	4	3	3	3	3	3	3
12	2	2	2	1	1	1	1	1	1
13	2	2	2	2	2	2	2	2	2
Total	96	91	82	72	62	62	60	60	57
Sample	96	182	246	288	310	372	420	480	513

*Sample size = number of firms (57) x number of years (9)

Table 2 Summary of Variable Measures

Main Variable	Variable Components	Measurements
Leverage	Total debt	Debt ratio: total debt divided by total assets
	Total assets	
Financial performance	GPM	Gross profit divided by
	NPM	Net income divided by
	ROA	Net income divided by total
	ROE	Net income divided by total
Age	Log (age)	Age is defined as the
Size	Log (total assets)	Total assets are defined as
Zakat	Log (zakat)	Zakat is defined by the
Time	Years	2002 to 2010
Firms	57 firms	Publicly traded companies

Table 3. Descriptive Statistics for Variables Originally Stored

Variable	N	Minimu	Maximu	Mean	SD	Skewnes	Normalit
Leverag	51	0.002	0.848	0.303	0.19	0.699	< 0.001*
GPM	51	-	20.8	-2.2	59.5	-22.603	< 0.001*
NPM	51	-	21.7	-2.6	67.2	-22.609	< 0.001*
ROA	51	-1.31	0.434	0.066	0.11	-3.319	< 0.001*
ROE	51	-0.565	0.517	0.098	0.13	-0.337	0.013
Zakat	51	0	25 x 10 ⁶	35,98	1.8 x	8.977	< 0.001*
Age	51	-1,976 ^a	55	19.7	88.9	-22.158	< 0.001*
Size	51	4.582	8.502	6.071	0.70	0.893	0.001

* Significant deviation from normality at $p < 0.001$
a Assumed to be a transcription error

Table 4. Descriptive Statistics for Screened, Cleaned and Transformed Data in SPSS

Variable	Outliers	N	Minimum	Maximum	Mean	SD	Skewness	Normality p-value
$\sqrt{\text{Leverage}}$	0	513	0.046	0.921	0.521	0.181	0.064	0.097
GPM	31	482	-2.272	0.988	0.442	0.51	-2.075	0.001
NPM	31	482	-2.369	0.963	0.399	0.532	-2.19	0.001
ROA	3	510	-0.416	0.386	0.069	0.095	-0.042	0.002
ROE	4	509	-0.565	0.517	0.101	0.132	-0.108	0.014
$\log_{10} \text{zakat}$	29	484	1.322	5.653	3.634	0.68	-0.143	0.355
$\log_{10} \text{age}$	0	513	0.602	1.74	1.329	0.2	-0.268	0.188
Size	0	513	4.582	8.502	6.071	0.706	0.893	0.001

Table 5 Testing of Null Hypothesis H_{01}

Hypotheses	Dependent Variables	Independent Variables	Inferential Statistics
H_{01} : High financial performance is not significantly related to lower capital structure H_{A1} : High financial performance is significantly	NPM GPM ROA ROE	Leverage level: 1 = ≤ 0.100 2 = 0.101–0.200 3 = 0.201–0.300 4 = 0.301–0.400 5 = 0.401–0.500 6 = 0.501–0.600 7 = 0.601–0.700 8 = > 0.700	Multivariate ANOVA

related to lower capital structure			
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Table 6. Matrix of Pearson's Correlation Coefficients between Financial Performance Indicators

Variable	GPM	NPM	ROA
NPM	0.994*		
ROA	0.726*	0.724*	
ROE	0.684*	0.686*	0.951*

* Significant correlation at $\alpha = 0.05$

Table 7. MANOVA Statistics to Test H_{01} : Multivariate Statistics for Significance of MANOVA Model

Effect	Wilk's	Multivariate	Hypothesis	Error	p-	Effect
Leverage	0.525	11.864	28	1,696	<	0.149

Table 8. MANOVA Statistics to Test H_{01} : Effects of Leverage on Each Financial Performance Indicator

Effect	Financial	Type III	df	Mean	F	p-	Effect
Leverage	GPM	9.088	7	1.298	5.295	0.000*	0.073
	NPM	8.724	7	1.246	4.64	0.000*	0.064
	ROA	0.256	7	0.037	5.212	0.000*	0.072
	ROE	0.251	7	0.036	2.5	0.016*	0.036

Table 9. Descriptive Statistics (Means and SDs) Indicating the Relationships between Leverage Levels and Financial Performance Indicators

Financial Performance Indicator	Leverage Level	N	Mean	SD
GPM	1	58	0.582	0.572
	2	122	0.524	0.522
	3	108	0.479	0.536
	4	46	0.445	0.521
	5	48	0.485	0.368
	6	47	0.288	0.259
	7	36	0.127	0.377

	8	16	0.07	0.685
NPM	1	58	0.532	0.576
	2	122	0.475	0.554
	3	108	0.436	0.553
	4	46	0.401	0.567
	5	48	0.45	0.37
	6	47	0.255	0.277
	7	36	0.1	0.378
	8	16	0.002	0.771
ROA	1	58	0.1	0.096
	2	122	0.085	0.092
	3	108	0.094	0.095
	4	46	0.083	0.079
	5	48	0.088	0.084
	6	47	0.051	0.049
	7	36	0.023	0.049
	8	16	0.023	0.026
ROE	1	58	0.108	0.104
	2	122	0.099	0.106
	3	108	0.126	0.129
	4	46	0.128	0.118
	5	48	0.16	0.15
	6	47	0.112	0.107
	7	36	0.064	0.137
	8	16	0.094	0.108

Table 10. Testing of Null Hypothesis H_{02}

Hypotheses	Dependent Variables	Independent Variables	Inferential Statistics
H_{01} : There is no significant relationship between capital structure and <i>Zakat</i> H_{A1} : There is a significant relationship between capital structure and <i>Zakat</i>	Log10 <i>Zakat</i>	Leverage level: 1 = ≤ 0.100 2 = 0.101–0.200 3 = 0.201–0.300 4 = 0.301–0.400 5 = 0.401–0.500 6 = 0.501–0.600 7 = 0.601–0.700 8 = > 0.700	Repeated Measures ANOVA

Table 11 Univariate ANOVA Statistics to Test H₀₂

Source	Type III	Df	Mean	F	p-value	η^2
Leverage	12.897	7	1.842	4.174	< 0.001*	0.058
Residual	210.132	476	0.441			

Table 12 Descriptive Statistics (Means and SDs)
Indicating the Relationships between Leverage Levels and Zakat

Leverage Level	N	Log ₁₀ Zakat		Zakat	
		Mean	SD	Mean	SD
1	57	3.479	0.773	3,013.80	5.9
2	128	3.533	0.597	3,415.40	4
3	116	3.526	0.676	3,357.70	4.7
4	48	3.672	0.564	4,694.40	3.7
5	48	3.785	0.673	6,088.60	4.7
6	43	3.855	0.715	7,157.80	5.2
7	29	3.992	0.799	9,820.00	6.3
8	15	3.991	0.485	9,797.60	3.1

Table 13: Testing of Null Hypothesis H₀₂

Hypotheses	Dependent Variables	Independent Variables	Inferential Statistics
H₀₁: Leverage, size, age and Zakat are not significant predictors of financial performance H_{A1}: Leverage, size, age and Zakat are significant predictors of financial performance	NPM GPM ROA ROE	√ Leverage of firm I at time t Size of firm I at time t log₁₀ age of firm I at time t log₁₀ zakat of firm I at time t	Multilevel Regression

Table 14 Factor Analysis: Total Variance Explained by Four Principal Components

Principal Component	Eigen Values		
	Total	% of Variance	Cumulative %
1	3.377	84.43	84.43
2	0.558	13.95	98.38
3	0.059	1.48	99.86
4	0.006	0.14	100

Table 15. Factor Analysis: Factor Loadings for the First Principal Component

Dimensions	Loading
GPM	0.928
NPM	0.928
ROA	0.921
ROE	0.899

Table 16. Multilevel Linear Regression Statistics (2002 to 2010)

Year	R ² %	p-value	Variable		Standardized β Coefficient	t	p-value	VIF (Collinearity)
2002	35.3	< 0.001 *	Intercept	β_0	-0.461	-0.399	0.691	
			$\sqrt{\text{Leverage}}$	β_1	-0.425	-3.51	0.001 *	1.2
			Size	β_2	-0.24	-1.03	0.308	4.3
			log ₁₀ age	β_3	0.209	1.741	0.088	1.1
			log ₁₀ zakat	β_4	0.629	2.686	0.010 *	4.3
2003	25.3	0.001 *	Intercept	β_0	-1.958	-1.232	0.224	
			$\sqrt{\text{Leverage}}$	β_1	-0.297	-2.30	0.025 *	1.2

			e			6		
			Size	β_2	-0.089	-0.38	0.706	3.8
			log ₁₀ age	β_3	0.107	0.85 4	0.397	1.1
			log ₁₀ zakat	β_4	0.571	2.46 6	0.017 *	3.7
2004	28.9	< 0.001 *	Intercep t	β_0	-0.404	- 0.26 4	0.793	
			√ Leverag e	β_1	-0.307	- 2.37 5	0.022 *	1.2
			Size	β_2	-0.296	- 1.18 5	0.242	4.5
			log ₁₀ age	β_3	0.066	0.53 8	0.593	1.1
			log ₁₀ zakat	β_4	0.76	3.15	0.003 *	4.2
2005	26.7	0.001 *	Intercep t	β_0	-0.948	- 0.80 8	0.423	
			√ Leverag e	β_1	-0.356	- 2.68 4	0.010 *	1.2
			Size	β_2	-0.274	- 1.16 6	0.250	3.8
			log ₁₀ age	β_3	0.22	1.80 1	0.078	1
			log ₁₀ zakat	β_4	0.613	2.78 1	0.008 *	3.4
2006	24.9	0.011 *	Intercep t	β_0	-4.086	-2.14	0.038 *	
			√ Leverag e	β_1	-0.111	- 0.83 9	0.406	1.1
			Size	β_2	0.147	0.60 2	0.550	3.6
			log ₁₀ age	β_3	0.121	0.92 6	0.359	1
			log ₁₀ zakat	β_4	0.339	1.41 1	0.165	3.5

2007	28.8	0.002 *	Intercept	β_0	-3.011	- 2.08 2	0.042 *	
			$\sqrt{\text{Leverage}}$	β_1	-0.291	- 2.21 2	0.032 *	1.2
			Size	β_2	-0.06	- 0.27 8	0.782	3.3
			$\log_{10} \text{age}$	β_3	0.207	1.70 4	0.095	1
			$\log_{10} \text{zakat}$	β_4	0.533	2.44 7	0.018 *	3.3
2008	19.4	0.010 *	Intercept	β_0	-4.246	-2.82	0.007 *	
			$\sqrt{\text{Leverage}}$	β_1	-0.296	- 2.05 5	0.046 *	1.2
			Size	β_2	0.207	0.85 5	0.397	3.4
			$\log_{10} \text{age}$	β_3	0.273	1.98 4	0.054	1.1
			$\log_{10} \text{zakat}$	β_4	0.173	0.74 4	0.461	3.2
2009	41.2	< 0.001 *	Intercept	β_0	-6.654	- 3.77 5	< 0.001 *	
			$\sqrt{\text{Leverage}}$	β_1	-0.417	- 3.36 9	0.002 *	1.3
			Size	β_2	0.139	0.67 2	0.505	3.5
			$\log_{10} \text{age}$	β_3	0.235	2.01 5	0.050	1.1
			$\log_{10} \text{zakat}$	β_4	0.416	2.12 7	0.039 *	3.2
2010	34.6	< 0.001 *	Intercept	β_0	-3.707	- 2.46 8	0.017 *	
			$\sqrt{\text{Leverage}}$	β_1	-0.334	- 2.70 2	0.010 *	1.1
			Size	β_2	-0.184	-0.83	0.411	3.7

			$\log_{10}$ age	β_3	0.243	2.02 3	0.049 *	1.1
			$\log_{10}$ zakat	β_4	0.655	3.07 7	0.004 *	3.4

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