Factors Influencing the Performance of Shariah Compliance Companies

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Abstract

The global business environment is really demanding the investors to be prepared with the emerging and dynamic markets. Measuring company’s performance is important for management, shareholders, government, customers, suppliers and other stakeholders that have importance or linkage with the wealth distribution directly or indirectly. To evaluate company’s performance, we need tools that can be used to measure the performance and one of most popular tools is the financial ratio analysis. This paper will explore the use of multiple discriminant analysis using samples from the various sector listed in Bursa Malaysia, especially the shariah compliance counters. The result using multiple discriminant analysis would identify the ratios that could identify or discriminate between the non-performing and performing companies.

Keywords: Multiple Discriminant Analysis (MDA), CAPM, Company’s Performance, Multivariate Analysis
1. Introduction

In this new era, most of the investors are demanding nearly perfect information to analyze the companies’ performance to make sure their investment can generate income and increase their satisfaction in the business market. Measuring companies’ performance is important especially to the management, shareholders, government, customers, suppliers, and other stakeholders that have interest to the company directly or indirectly.

Most of the practitioners, fund managers, owners, stockholders, personnel, customers, suppliers, competitors, regulatory agency, practitioner and academicians are using financial ratio to evaluate company’s performance. The financial ratio is a useful byproduct of financial statements and provides standardized measures of a firm’s profitability and riskiness. It also used to forecast the future success of companies, while the researcher's main interest is to develop models exploiting this ratio.

The information available is normally prepared by the management and audited by the audit firm of the company. This financial statement is prepared yearly, quarterly and semi-annually. Sometimes the relationships between financial ratios are inversely related. This could make the decision-making in company’s performance is a cumbersome processes. In analyzing performance using financial ration from financial statement, there are two issues arise in differences in accounting standards and practices and how these differences may vary the comparisons across companies. The second relates to accounting for acquisitions and how this can affect both acquisition method and price.

The objective of this paper is to introduce an alternative model using multivariate analysis, Multiple Discriminant Analysis (MDA). We are going to evaluate companies’ performance in Malaysia and to segregate them into two clusters or groups. The best financial ratios will be chosen to separate between performing and under-performed into two different groups.
2.0 Objectives of Research

1. To analyze data collected by using multiple regression for identifying the performing and non-performing companies and using Multiple Discriminant Analysis for discriminating the ratios.
2. To identify the ratios that could discriminate the performing and under-performing companies.
3. To validate the model with the Practice Note 4 and Practice Note 17 companies with the performing companies.

2.1 Significance of the Research

This is an exploratory research in Malaysia using the multi-variate analysis. The research will be useful in determining the performing and non-performing companies by using two methods i.e. regression and ratio analysis. The findings could be used by potential investors and the stock market players in identifying the underperforming companies and detecting the early warning signals of non-performing.

3. Literature Review

George T. Albanis and Roy A. Batchelor (1999) stated that nonlinear methods yield improvements in classification over the linear model, which are statistically significant, but translate to only small increases in financial returns. They explores the potential for identifying outperforming shares using nonlinear statistical classification methods comparing Linear Discriminant Analysis with a Probabilistic Neural Network, a Vector Quantization procedure, a Recursive Partitioning, and a Rule Induction Algorithm. The inputs are 38 accounting ratios for around 700 companies with shares traded on the London Stock Exchange in the years 1991-97.

Dan Givoly and Carla Hayn (2002) said that there is a rising conservatism in the conservatism by U.S. companies in the past few decades. Using a constant sample of almost 900 companies, examined several measures of accounting conservatism, including the level and rate of accumulation over time of negative non operating accruals, the differential timeliness of incorporating good news versus bad news in
reported earnings, the skewness and variability of the earnings distribution relative to the cash flows distribution, and changes in the market-to-book ratio. The increased conservatism has contributed to a persistent and prevalent decline in reported profitability, an increase in the incidence of losses, and an increase in the dispersion of earnings. Increased conservatism affects financial ratios and P/E multiples. Therefore, financial ratio use in determining the performance of the company can be manipulated.

Discriminant Analysis (DA) is a statistical tool that can predict the group membership of a newly sampled observation (Toshiyuki Sueyoshi and Shiuhsan Hwang, 2004). Sueyoshi and Kirihara (1998,1999) have recently proposed a new type of nonparametric DA approach that provides a set of weights of a linear discriminant function, consequently yielding an evaluation score for the determination of group membership. The nonparametric DA is referred to as "Data Envelopment Analysis-Discriminant Analysis (DEA-DA)," because it maintains its discriminant capabilities by incorporating the nonparametric feature of DEA into DA. In this study, a use of two statistical tests is proposed for DEA-DA and its discriminant capability is compared with DEA from a perspective of financial analysis.

Study by Ozgur Turetken aims to predict the financial performance of publicly traded Turkish firms using their available financial data. Financial performance is measured by a firm’s inclusion in an index of top performers, where the inclusion of firms is based on the value and sales volume of their stocks. Two alternative techniques, multiple discriminant analysis and neural networks, are used for this prediction problem, and their prediction accuracy is compared.

Research made in determining the analyst’s financial forecast accuracy and information transparency by Hsiang-tsai Chiang, he used multiple regression analysis for the independent variable to predict dependent variable. The result shown that the relationship direction between corporate transparency EPS forecast bias was negative as expected, which indicated that when the company disclose more information, the forecast bias will become lower and forecast accuracy will be higher.

Discriminant analysis in this study by Kevin Keasey and Robert Watson (1986) is used to examine empirically whether current cost accounting (CCA) information may be useful for predicting the performance of small companies. A matched sample of failed and non-failed firms is chosen and historic cost accounts are adjusted in line with the requirements of Statement of Standard Accounting Practices
The companies are all single-plant independently owned firms in the Northeast of England; all the failed firms had ceased to trade during 1974-1980.

Theory of investment (Scott, 1977) states that financial reports objectives are to give information to help investor, creditors, and others financial reports user to assess amount, time, uncertainty acceptance from cash dividends and interest for the future. In other words, the financial reports will assist investors in gathering information about risk and return from investment activities.

Ball and Brown (1968) tested about the contents of profit information in share prices and found that financial ratios can be useful to predict bankruptcy (Altman, 1968; Sinkey, 1975; Dambolera and Khoury, 1980; Thomson, 1990), to predict return (O’Conner, 1973; Ou and Penman, 1989), and to predict revenue growth (Freeman et al., 1982; Ou, 1990; Penman, 1992).

Company that is showing a sign of having financial could be identified early using company’s financial performance. Beaver (1966) did a study about a brittle of the company five years before that company really failed. Altman (1968) also did the same like Beaver in order to identify the success and failure of banks.

There are many professionals using multiple discriminant analysis in their study such as E. Altman (2000), who use MDA and ZETA models to evaluate unique characteristics of business failures in order to specify and quantify the variables which are effective indicators and predictors of corporate distress of firms not traded publicly, to non-manufacturing entities, and also refer to a new bond-rating equivalent model for emerging markets corporate bonds.

It is also quantifiable characteristics of potential bankrupts but also the utility of a much-maligned technique of financial analysis: ratio analysis and updates the predictive tests on defaults and bankruptcies through the year 1999. The sample of 66 companies is selected on the basis of net income (deficit) reports in the years 1958 and 1961, with 33 from each year. Over 65% of these firms had suffered two or three years of negative profits in the previous three years. The firms are selected regardless of their asset size, with the only two criteria being that they were manufacturing firms which suffered losses in the year 1958 or 1961. The companies are then evaluated by the discriminant model to determine their bankruptcy potential.

Altman (2000) mentioned that the MDA technique has the advantage of considering an entire profile of characteristics common to the relevant firms and another advantage of MDA in dealing with classification problems is the potential of
analyzing the entire variable profile of the object simultaneously rather than sequentially examining its individual characteristics.

Most recent research on the use of discriminant analysis on evaluating company performance in Malaysia is by Muhammad Rubini Kertapati and Nuradli Ridzwan Shah Bin Mohd Dali (2004). This research is using 11 ratios as independent variable to determine the performance of finance company in financial industry in Malaysia. According to this research paper, the researcher is unable to conduct the model validation due to the sample size.

Due to lack of study of the performances of Malaysian Market using Multiple Discriminant Analysis, we have to do a further research so that there is an information and technique available to Malaysian market by using a good model.

4. Research Methodology

4.1 Multiple Discriminant Analysis

Discriminant Analysis is used in situations where you want to build a predictive model of group membership based on observed data - characteristics, attitudes, and demographic data. It is an a priori technique in that the groups are defined beforehand (the opposite of cluster analysis where we use the methodology to form the groups).

The analysis produces a linear equation that can be used to explain which variables best discriminates between two or more groups, and consequently, builds a predictive model that can be used for future classification.

Discriminant analysis covers a differentiation of variate, linear combination of two (or more) independent variable that will be used to distinguish group categories. It can be achieved by defining the weight for every variable to maximize relatively inter group variance relative to within group variance. The linear combination for the discrimination function needs to be differentiating in a form:

\[ Z_i = W_1X_1 + W_2X_2 + W_3X_3 + \ldots + W_nX_n \]

Where:

- \( Z \): Discriminant score for company \( i \)
- \( W_n \): Discriminant weight for variable-\( n \)
- \( X_n \): Independent variable
The next step is to test the hypothesis whether the groups mean from a set of independent variables, for two (or more) groups different or the same? To differentiate between these two groups, we will use discriminant function to find the discriminant score for each individual company in analysis.

Then, individual company score in one group will be averaged to get the group mean. We call the group mean, CENTROID. If we observe two groups, than we will have two Centroids. The centroids show the important location for a group. The comparison between centroids will show how far the separation among those groups could be observed.

The significance test for discriminant function is generalization result of a distance measurement among centroids. It measure with comparing discrimination score between two (or more) groups. If the distribution has small overlapping, it means that the discrimination function is a good discriminator.

The next step is to assess the model itself. The primary tool here is Wilks' Lambda test. The Wilks' Lambda test tests the hypothesis that the means of the functions listed are equal across groups, Wilks' lambda being the proportion of the total variance in the discriminant scores not explained by differences among the groups. A significance value less than 0.05 indicate that the group means differ, and therefore the function is a significant discriminator. This is clearly the case in this study and one can conclude that the function is a valid discriminator.

The hypotheses of this study are as follows:

Hypothesis 1. *The ratios used by Altman do not differ in improving the power of non performing companies.*

Hypothesis 2. *For a sample of non performing companies, firm size is negatively related to the likelihood of non-performance.*
4.1.1 Stage of Discrimination Analysis
The discrimination analysis followed these six steps, in figure below:

The Process of Discriminate Analysis

- **RESEARCH PROBLEM**
  - Evaluating the difference for multivariate profile
  - Observation classification in a group
  - Identification the dimension difference among group

- **RESEARCH DESIGN**
  - Variable selection and dependent variable
  - Sample

- **ASSUMPTION**
  - Normality of independent variable
  - Linearity
  - No multicolinearity
  - Same matrix dispersion

- **ESTIMATION OF DISCRIMINATION FUNCTION**
  - Estimation using stepwise
  - Test of the significance of discrimination function

- **MEASUREMENT OF THE ABILITY OF PREDICTION**
  - Hit Ratio
  - Signification of the prediction ability
  - Maximum chance of classification

- **INTERPRETATION AND EVALUATING OF DISCRIMINATION FUNCTION**
  - The weight of discriminant
  - Discriminant loading
  - Partial F value

Rubini (2004)
4.2 Jensen’s Alpha

Jensen’s alpha is used to evaluate historical performance of a portfolio. These method measures the difference between realized return and expected return for a period of time. The measurement of Jensen’s alpha coefficient is differentiated from the estimation parameters of Capital Asset Pricing Model (CAPM), from finding the alpha and beta coefficient of a stock. The procedure to estimate beta is to regress between individual return ($R_i$) and market return ($R_m$):

$$R_i = \alpha + \beta R_m$$

Where:

$\alpha$ : Intercept

$\beta$ : Slope of regression = $\text{Covariance}(R_j, R_m)/\sigma_m^2$

Slope of this regression shows the beta value, which is the risk of that stock.

Capital Assets Pricing Model (CAPM) equation:

$$R_i = R_f + \beta(R_m-R_f)$$

Intercept from the regression can be used to measure performance of that stock at that time.

Then the CAPM model in equation (4.2) can be modified to equation (4.3):

$$R_i = R_f (1- \beta) + \beta R_m$$

From equation (4.3) is similar with regression form from equation (4.1); it will be shown that $R_f (1- \beta)$ from the CAPM model is similar to $\alpha$ and $\beta$ with $\beta$. The comparison between $\alpha$ and $R_f (1- \beta)$ can be used to measure the performance of stocks at that time. So, if:

$\alpha > R_f (1- \beta)$ it means that during the estimation period, the performance of the stocks is good (Performing).

$\alpha = R_f (1- \beta)$. It means that during the estimation period the performance is as the same as it is expected.
\[ \alpha < R_f(1 - \beta) \]. It means that during the estimation period the performance of the stocks is poor (under performing).

The difference between \( \alpha \) and \( R_f(1-\beta) \) is called Jensen’s alpha. The measurement is used to see whether the stocks are performing or under-performing.

### 4.3 Variables and Measurement

Financial ratio is used to measure the individual company’s performances. The ratio that going to be used as independent variable shown as below:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Variables</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Current Assets/Current Liabilities</td>
<td>Q7</td>
<td>Profit Margin</td>
</tr>
<tr>
<td>Q2</td>
<td>(Current Assets-Inventory)/Current Liabilities</td>
<td>Q8</td>
<td>Total Assets Turnover</td>
</tr>
<tr>
<td>Q3</td>
<td>Working Capital/Total Assets</td>
<td>Q9</td>
<td>Account Receivables Turnover</td>
</tr>
<tr>
<td>Q4</td>
<td>Return on Equity</td>
<td>Q10</td>
<td>Sales/Fixed Asset</td>
</tr>
<tr>
<td>Q5</td>
<td>Return on Asset</td>
<td>Q11</td>
<td>Debt to Equity Ratio</td>
</tr>
<tr>
<td>Q6</td>
<td>Operating Profit Margin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The Independent Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Types of Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1, Q2, Q3</td>
<td>Liquidity</td>
</tr>
<tr>
<td>Q4, Q5, Q6, Q7</td>
<td>Profitability</td>
</tr>
<tr>
<td>Q8, Q9, Q10</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Q11</td>
<td>Solvency</td>
</tr>
</tbody>
</table>

The dependent variable is a categorical variable that consists of 1 and 2. If the company has a under performing it will be categorized into 2. On the other hand, the
company will be categorized into 1 if it has a performing. This categorical procedure follows the Jensen’s alpha method.

The individual return, $R_i$, measured by monthly data from January 2000 until December 2003 using this formula:

$$R_{it} = \frac{(P_{it} - P_{it-1} + \text{Dividend}_{it})}{P_{it-1}}$$

Where:

- $P_{it}$: Monthly price in period $t$.
- $P_{it-1}$: Monthly price in period $t-1$.
- $\text{Dividend}_{it}$: Dividend at period $t$.

The market return, $R_m$, is measured by BURSA MALAYSIA monthly index. The formula is:

$$R_{mt} = \frac{(KLSE_{mt} - KLSE_{mt-1})}{KLSE_{mt-1}}$$

Where:

- $KLSE_{mt}$: KLSE index at period $t$.
- $KLSE_{mt-1}$: KLSE index at period $t-1$.

The risk free rate, $R_f$, is measured by Cagamas monthly. Then we regress the market return to individual return to get $\alpha$ and $\beta$. If the Jensen’s alpha is negative, we categorize it into under performing and if Jensen’s alpha is positive, we categorize it into performing.

SPSS 12.0 is used to estimate the regression function and discrimination function.
5. Research Timeframe

The research is expected to start on the 1st of Nov 2006 and end on the 31st of Oct 2007, a total of 1 year period.

<table>
<thead>
<tr>
<th>Activities / Months</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nov</td>
<td>Dec</td>
</tr>
<tr>
<td>Literature review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data collection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data input</td>
<td></td>
<td></td>
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<tr>
<td>Data analysis</td>
<td></td>
<td></td>
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<tr>
<td>Writing 1st draft</td>
<td></td>
<td></td>
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<tr>
<td>Report finalisation and submission</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Research Budget

The following budget detailed out the required amount to fund the research:

<table>
<thead>
<tr>
<th>Description</th>
<th>RM</th>
<th>RM</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Data Collection – Stock markets data for the respective companies in the respective sectors will be bought from Bursa Malaysia</td>
<td></td>
<td>3,000</td>
</tr>
<tr>
<td>b) Travelling expenses</td>
<td></td>
<td>2,400</td>
</tr>
<tr>
<td>Transportation (150km x 20 trips x RM0.70/km)</td>
<td>2100</td>
<td></td>
</tr>
<tr>
<td>Entrance Fee (Library) RM 15* 20</td>
<td>300</td>
<td>2,100</td>
</tr>
<tr>
<td>c) References (Books)</td>
<td></td>
<td>1,700</td>
</tr>
<tr>
<td>d) Printing and stationery</td>
<td></td>
<td>8500</td>
</tr>
<tr>
<td>Thumb Drive Pen 2 * RM150</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Xerox and Photocopies</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>A4 papers: 10 reams * RM10</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Binding cost</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Cartridge: RM100 * 2</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>8500</td>
<td></td>
</tr>
</tbody>
</table>
7. References


