ANALYSIS OF INTERNAL FACTORS AFFECTING SHARE PRICES: REFERENCE TO DIVERSIFIED FINANCIAL COMPANIES IN COLOMBO STOCK EXCHANGE, SRI LANKA

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DECLARATION

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ABSTRACT

The stock market plays an important role in economic progress of any nation and share price is a key aspect in stock market. Share price is the value of single share of a company's multiple sellable stocks. It represents not only present value of a company, but also the growth. However, the stock market is dependent on several factors and hence, it fluctuates and predicting becomes much more complicated.

This study aimed to determine internal factors that influence share price of 24 diversified financial companies listed in Colombo Stock Exchange in the period from 2014 to 2019. Impacts of six variables namely return on assets, return on equity, book value per share, earnings per share, dividend per share and dividend yield on market price of shares in the respective sector were studied. Yeo and Johnson power transformation was used to transform the data and then used for model fitting. The panel data models: ordinary least square with common effect model; fixed effects model; and random effects model were tested. Among these models, the best model was fixed effects model.

The results indicated that return on assets, return on equity, book value per share, earnings per share and dividend per share have positive relationship with share price and dividend yield has negative relationship with share price. Further, all these factors have significant impact on market price of share and dividend yield has higher influence whereas book value per share has lower influence on share price.

Results of this study implies that investors can take most advantageous investment decisions and be guaranteed favorable returns if they take into consideration of these significant determinants

In the future, it can be aimed to complement a study in various sectors with in internal and external variables of and a large timeframe. This would provide better insights on the determinants of share price.

Keywords: Colombo stock exchange, diversified financial companies, share price, panel data

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LIST OF ABBREVIATIONS

Abbreviation	Description
BLUE	Best Linear Unbiased Estimate
BVS	Book Value per Share
CSE	Colombo Stock Exchange
DPR	Dividend Payout Ratio
DPS	Dividend per Share
DY	Dividend Yield
EPS	Earnings per Share
ER	Exchange Rate
EV	Earnings Volatility
EY	Earnings Yield
FEM	Fixed Effect Model
FL	Financial Leverage
FS	Firm Size
LM	Lagrange Multiplier
MPS	Market Price of Share
OLS	Ordinary Least Square
PER	Price Earnings Ratio
POLS	Pooled Ordinary Least Squares
P-P plot	Predicted Probability plot
REM	Random Effect Model
ROA	Return on Asset
ROE	Return on Equity
SP	Share Price
VIF	Variance Inflation Factor
YJ_BVS	Yeo–Johnson power transformed Book Value per Share
YJ_DPS	Yeo–Johnson power transformed Dividend per Share
YJ_DY	Yeo–Johnson power transformed Dividend Yield
YJ_EPS	Yeo–Johnson power transformed Earnings per Share
YJ_MPS	Yeo–Johnson power transformed Market Price of Share
YJ_ROA	Yeo–Johnson power transformed Return on Asset
YJ_ROE	Yeo–Johnson power transformed Return on Equity

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Financial market is a place for the exchange of financial assets and obligations. Any financial market has two major components, that is to say, capital market and money market. Financial instruments are traded in the capital market in the long and medium term and money market is the market for short-term funds. The money market is primarily for managing the financial system's short-term liquidity, while the capital market is used to fund fixed investments for corporations and government.

Economic growth is being driven by a changing influx of funds. In a broader sense, the term capital market is often used to refer the companies that provide the supply of long-term capital demand, including the stock exchange, the banking sector, insurance firms and other financial institutions. And it seeks to maximize savings and make it possible to collect vast amounts of funds by assets such as shares, government securities and bonds. The prevailing price on the capital market and the rates of return on these financial instruments have the essential economic role of allocating resources and maintaining a sufficient degree of economic activity equilibrium between saving and investment.

Role of share market

One of the capital market's most important aspects is the share market, which offers a structured marketplace for share and bond trade, utilizing to harness both internal and overseas savings to finance firms. To promote economic growth, Bagehot (1873) and Schumpeter (1911) proposed the concept of financial development. Schumpeter (1911) claimed that an evolved and well-organized financial structure could lead to a country's economic development. Share market act as a real instrument for accumulating and allocating savings among the economic growth and economic efficiency.

Stock exchange is a legal agency for the registration of shares of companies; securities etc. and monitoring of the share market. An exchange's central role is to ensure fair and orderly trade and to efficiently disseminate pricing details on all securities traded on that market. The share market indicates the firms that list equity shares for purchase and sale by public investors. Stock exchanges are systems which permit the trading of certain securities or stocks. When the stock exchange would not exist, the companies would not have a formal share trading mechanism, at the same time, without the share market, so the exchanges would have no incentive to exist.

The growing value of financial markets around the global has strengthened the popular perception that 'finance' is a significant component of economic development. Therefore, prominence has prevailed on economic growth and the development of share market. As a significant aspect of a nation's economy, the share market have a crucial part in the growth of commerce and business that eventually influences the country's economy to a huge extent. This is why the corporate authorities, government and even the country's central bank hold a close watch on the operations of the share market. The share market is also perceived to be the key predictor of economic development of the country.

Investment in shares

The share is inseparable component of capital that reflects the association of ownership in the middle of the firm and the shareholder. Shares reflect a percentage of the company's ownership while stock is a simple accumulation of a company's shares. The shareholder is a person or organization that legally holds one or more shares of stock in a public or private company. Shareholders receive the benefits of the firm's prosperity because they are fundamentally the proprietors of that company.

The price of a share tells buyers and sellers of its current value. The share's intrinsic value can be greater or lesser. The stock investors aim is to identify stocks which the market currently undervalued. Stocks will be a beneficial part of the portfolio of investments. Owning stocks at different firms will help you to develop your wealth,

secure your capital from inflation and taxes, and increase your investment profits. It is important to know that when you invest in the stock market, there are risks too.

Development of Sri Lankan share market

During the British Colonial era, the beginning of share trading in Sri Lanka was connected to the plantation industry. In 1896, the Colombo Stock Brokers Association (CSBA) was established and began trading in shares of limited liability companies. Later, the name of the association was renamed as Colombo Brokers Association (CBA) in 1904.

In June 1948, with the implementation of the Exchange Control Regulations, Colombo Stock Market trades were limited to local companies only. Since 1977, the country's liberal economic policies had demonstrated a tendency to place more responsibility on the private sector rather than on the government taking a dominant position in economic development. Over a period of about 80 years, the Colombo Brokers Association was involved on the share market and was initially introduced as a replication of the London share market.

At the same time, another association that called the Stock Brokers' Association (SBA) launched their share market at another location on 1984. CBA and SBA were incorporated in 1985 under the name of Colombo Securities Exchange Limited. This name was changed to Colombo Stock Exchange (CSE) in 1990.

Colombo stock exchange

CSE is Sri Lanka's one and only structured market for the listing and trading companies’ shares. This offered both a primary and secondary market for the trading of existing shares. The Securities and Exchange Commission is the statutory body which regulates the stock market. The goal of the share market policy should be to establish a fair, effective and secure share market.

In the later part of 2007, the worldwide economic crisis that had engulfed the entire economy triggered severe instability and stock market turmoil. And also the 30 year

of Sri Lanka's civil war eradicated by 2009. Aside from the global financial crises and the civil war, the investment movement was centered on the stock market, where investors were actively watching at shares volatility as a source of substantial returns for investors. Shares investment had been a type of funding to satisfy company needs, including such extension, growth, and diversity. This is a commonly known fact that investors are risk averse.

At present there are 289 companies listed in the CSE with the LKR 2,404.67 billion market capitalization The Colombo Stock Exchange calculates the indices of twenty sectors on continuously and at the end of everyday trading, the closing prices are released. This represents the price volatility of firms in the twenty service sectors. The sector price indexes are thus perceived to be an indicator of market dynamics. These are intended to assess the function of different industrial groups in the share market in Sri Lanka as defined by the Global Industry Classification Standard.

1.2 Research Problem

The prices of the shares shall be determined according to supply and demand. As supply meets demand the price declines and the price increases as demand exceeds the supply.

The share market roles an essential and influential part in the nation's economic progress by encouraging the accumulation of resources and enhancing economic growth. The market frequently shows movements in the share prices of companies. People who buy and sell their shares on the share market are also eager to monitor price volatility to try and increase their profits.

In past years, the company's share prices have fluctuated on many occasions. The price indices clearly reflect those fluctuations. Nonetheless, despite these volatility, share price of each company enjoys various price level. There can be any reason for stock price fluctuations and there may be some other reason for each company to experience different price levels. That implies, that the fluctuation of share prices over time is determined by each company's' fundamental factors as to the share price

However, the stock market is dependent on several factors and hence, it fluctuations are challengeable to understand, and predicting becomes much more complicated. This is why investors and financial advisors face challenges of forecasting realistic share values in order to generate profitable returns.

Scholars have related the market price to a range of internal and external influences. Company efficiency, management, assets and liquidity status, dividends and profits are general internal variables for the company. The external influences include governmental legislation, economic trends, consumer behavior, market conditions, financial dynamics, natural disasters and political instability etc. In this study examined the accountable internal factors that influence the market price of share. The identified internal variables are as follows:

Return on Asset (ROA):

Return on asset is a measure to evaluate a company's profitability which is related to that firm's total assets and also it is net earnings per asset unit, which is equal to income after tax over total assets. The net income divided by total assets is a computation of ROA, which gives a ratio of profits produced from the capital invested. ROA is an efficient management to produce income from each unit of investment.

$$\text{Return on Asset} = \frac{\text{Net Income}}{\text{Total Assets}} \quad \text{..... (1.1)}$$

Return on Equity (ROE):

Return on equity is net gains per investment of equity capital. The ROE sets out the extent to which the company has benefited from the capital spent by the shareholders. ROE also measures the degree of efficiency of the management of the company through the utilization of shareholder investment; the relatively high ratio is used as an indicator of higher management performance. If any company have positive value of both net income and shareholders' equity then the ROE can be measured as a percentage. Negative ROE is meaningless as an indicator of organizational performance.

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholders'Equity}} \quad \text{..... (1.2)}$$

Book Value per Share (BVS):

The book value per share is a market value ratio. The estimate is based on the common stockholders ' equity, and the preferred stock will be removed from the equity value when measuring the BVS of a company. This is because preferred stockholders are ranked higher during liquidation than common stockholders. The BVS represents the amount of the money left after settlement of all obligations and liquidation of the company's properties.

$$\text{Book Value per Share} = \frac{\text{Shareholders'Equity} - \text{Preferred Stock}}{\text{Average Number of Shares Outstanding}} \quad \text{…..... (1.3)}$$

Earnings per Shares (EPS):

Earnings per share is the amount of money that will be earned by each share of the company if all income were assigned to the outstanding shares at year end. Often, EPS is a measure demonstrating how efficient a company is on a shareholder basis. Therefore, a larger company's EPS can be compared with the EPS of smaller company. Obviously, this computation is highly affected on how many shares are outstanding. So, a large company would have to divide its profits among many more shares in the company compared to a smaller one.

$$\text{Earnings per Share} = \frac{\text{Net Income} - \text{Preferred Dividends}}{\text{Weighted Average Common Shares Outstanding}} \quad \text{…. (1.4)}$$

Dividend per Share (DPS):

DPS is the announced dividends paid out amount for each outstanding ordinary share by a company. This value is determined by dividing the total dividends including interim dividends which paid by a company, by the number of ordinary shares outstanding over a period of time. DPS is an important indicator for investors because

the value a company pays in dividends directly transforms into the income of the shareholder and the DPS is the shortest and clearest formula to be used by an investor to measure his or her dividend income over time from holding stock.

$$\text{Dividend per Share} = \frac{\text{Total Dividends Paid}}{\text{Number of Shares Outstanding}} \quad \text{……..…… (1.5)}$$

Dividend Yield (DY):

The DY is a formula that measures the amount of cash dividends paid per share according to the stock valuation of the common shareholders. Investors use the DY to explain how their stock investment either produces cash returns in the form of dividends, or by stock appreciation raises the valuation of assets.

$$\text{Dividend Yield} = \frac{\text{Cash Dividends per Share}}{\text{Market Value per Share}} \quad \text{……...…… (1.6)}$$

Market Price of Stock was the response (depended variable) in this study of determining the factors influencing share prices. The share is a basic unit of stock and the general idea of stock is a document which indicates ownership of the company. The share price is the highest amount that someone wants to pay for the share, or the lowest amount that they can buy for. Share prices are unpredictable, as they rely primarily on buyers and sellers' expectations. Depending on a number of factors in the globalized marketplace and within the organization itself, it may and must rise and fall.

To make the investment decision, having idea and perception about the share price determinants is much useful. Several studies have been undertaken in developed countries to analyze the determinants of market price of share, but few number of studies on this topic have been performed in Sri Lanka. It provides a requirement for evidenced based research, and may help to explain the determinants of market share prices.

1.3 Research Objectives

It is essential to know prices in making decision to gain a profit. Since it is difficult to predict, as an alternative, if one can identify factors affect share price and their relationships with the share price, it will be much useful in making the correct decision and maximize the profit.

Studies related with diversified financial companies are lacking in Sri Lanka, a research gap can be identified to determine significant impact of internal factors on share price of Sri Lankan diversified financial companies.

The Diversified Financial Sector is one of a sector in CSE, the companies in this sector provide a diverse range of financial services and the companies known as non-banking finance and leasing institutions. The LMD 100: Sri Lanka's Leading Listed Companies Report for the year 2018/19 published the following statement about the financial sector firms in CSE:

> Finance companies are third in line with their cumulative top line of 419 billion rupees accounting for 11 percent of the LMD 100's aggregate income. The sector is also the runner-up in the asset stakes – behind the banks, which represent nearly half of the LMD 100's total assets. (para. 6)

At the investor's point of view, nonetheless, to make an appropriate investment decision, it is necessary to have awareness and understanding of the share price determinants.

The objective of the study was to identify internal factors that influence the share prices of selected diversified financial companies listed in Colombo Stock Exchange and to determine the relationship between these factors and market share prices.

1.4 Significance of Study

This study may assist the investors and fund managers while taking the investment decision. The present study will also notify investors that which internal factors have

a significant effect on the share prices of diversified financial firms in Sri Lanka. Recommendations will also be made to the listed companies to take the necessary action to develop the impact variables included in this study.

The price performance of company's equity shares is one of the most considerable indicator to measure the company's success and management competence. If a firm's equity share enjoys good price performance then raising additional funds is easier for the company. Knowledge of the relative impact of various internal factors on stock prices in this context offers some guidelines for financial decision making aimed at increasing market share price.

Investors sometimes make wrong decisions because of their indifference or misunderstanding of the stock market function. Knowledge about the stock price determinants is likely to dissipate incorrect concepts and shape better judgment and investment decision. While so important to the economy, since there is no empirical study done in Sri Lanka with respect to diversified financial companies, this study offers some guidance for understanding the determination of share prices in that sector.

1.5 Limitations of Study

The aim of this study was to investigate the variables affecting the share price of diversified financial companies listed on the Colombo stock exchange and the analysis covers the period from 2014 to 2019. This study undertook in 24 listed companies of diversified financial sector in CSE which paid dividend to the shareholders for the selected period.

This study was focused on six years secondary data, and depended mainly on the listed companies' annual reports and financial statements published by the respected companies in 2014 to 2019.

Panel data structure was used in the study. Yeo and Johnson power transformation has been used to transform the data and then used for model fitting. Therefore, ordinary least square with the models of common effect model; fixed effect model and random

effect models have been tested to fit the best model. In this study, models in the form of multiple linear regression models were used.

1.6 Organization of Report

The report is composed of five chapters and the overview of the report is as follows:

The literature review of this study discusses in the second chapter and the chapter converse about theoretical literature on previous studies on determinants of share price. The third chapter describes the research method adopted in this study. It explains the data collection, variables of study, hypotheses of study, details of models, actions for the violations of assumption and software used. Findings of the determinants of market price of shares as a dependent variable discuss in the chapter four. Finally the last chapter summarizes the results and provides the conclusion for the research objectives. Also, this chapter states the implications of the study, limitations of the study and recommendations for future researches.

CHAPTER 2

LITERATURE REVIEW

Many study have been carried out on the factors which influence the market price of share. These factors can be classified as internal, external, technical and investor's behavior. But very few studies have been conducted for the companies in Sri Lank. This chapter discusses the relationship between internal factors and the MPS. The focus is more on the bank, finance and insurance sector companies and the companies in Colombo stock exchange.

Using the samples of 72 listed non-financial firms from CSE in Sri Lanka, Lingesiya and Suganya (2019) have examined impact of factors on share price (SP) with data in to use panel from period of 2013 to 2017. The fixed effect regression analysis techniques was used. This study revealed that, DY shows significant positive impact on SP volatility whereas DPS shows the significant negative impact on SP movements. Exchange rate (ER) and firm size (FS) illustrate a significant negative influence on SP volatility by indicating if FS is large, SP volatility will be high. But, dividend payout ratio (DPR), financial leverage (FL) and earnings volatility (EV) do not significantly convince the SP volatility in this study. Furthermore, DY, DPS, ER and FS have significant impact on price volatility in Sri Lankan context.

With the eleven financial and nonfinancial firms of Nepal, Ghimire and Mishra (2018) have conducted a study to determine the association of SP and independent variables of DPS, EPS, PER and BVS. The study has been carried out in the period from 2012 to 2017. The multiple regression analysis has been used to investigate the factor affecting the stock price. They found that all the explanatory variables have positive and significant impact on SP. Further, PER has higher influence whereas EPS has lower effect on MPS.

Lingesiya (2018) has examined the factors influencing SP of domestic commercial banks listed in Sri Lanka. A sample of ten domestic banks have been selected to carry out the analysis for the period of 2011 – 2015. The data have analyzed using the pooled

OLS regression technique. The study revealed that EPS, DPS and bank size have significantly positively influenced on SP while none of the external factors such as interest rate, inflation and ER show any significant impact on SP of listed commercial banks in Sri Lanka.

Morawakage and Piyarathna (2018) have investigated the impact of dividend on SP in Sri Lanka with the empirical data of the CSE from 2008 to 2016 for fourteen cross sections relating to three sectors which displayed more SP volatility at the time of undertaking the research. The estimated generalized least square FEM resulted the evidence that dividend has no significant impact on SP.

Using the 45 financial sector companies listed in the Nigerian stock exchange, Olotu and Gassol (2018) have analyzed the influence of primary accounting variables and macroeconomic variables on SP. The data have been analyzed by the random effect regression model. The study revealed that EPS, PER, ER, oil price and market capitalization have significant impact on SP but liquidity has on impact on SP. Furthermore, ER and oil price have negative influence on equity price while remaining have positive influence on SP.

Rosikah et al. (2018) have examined the effects of ROA, ROE, EPS on corporate value. The samples of 32 companies listed on the Indonesia Stock Exchange have been selected to carry out the analysis for the period 2006 to 2010. The multiple regression analysis method has been used to analyze the data. The study revealed that the ROA has significantly positively effected on firm value; ROE has positively but not significantly effected on firm value and EPS has negatively but not significantly effected on firm value. However, ROA, ROE and EPS have simultaneous significantly effected on firm value.

Wijerathna, De Silva, Prabod, Sandaruwan and Prashath (2018) have conducted a study to examine the impact of accounting information or variables on SP of listed companies in the CSE in Sri Lanka. SP has been selected as the dependent variable and DY, DPR, EPS, PER and FS have been considered as explanatory variables of this

study. The study found that DPR, EPS, PER and FS have positive significant relation on SP while DY has negative significant relation on MPS.

With the 25 manufacturing companies under the CSE, Atchyuthan (2017) has done a study to identify the determinants of SPs. The study has been carried out in the period of 2012-2016. The regression analysis method has been employed as a statistical technique. He could reveal that EPS and DPS had significant positive association with SP.

Dissanayake and Biyiri (2017) have found that EPS, DPS and ROE have significant impact on SP. Further EPS and DPS show a strong positive relationship with SP. Analysis has been carried out with a sample of 20 hotels listed in CSE and correlation and regression techniques have been used to find this results.

Using the 20 insurance companies listed in Amman Stock Exchange, Al Qaisi, Tahtamouni and Al-Qudah (2016) have examined the factors impact on the MPS during the period of 2011 to 2015. Multiple liner regression has been used to analyze the data. The results reveled that there is an effect of debt ratio, age of the company and FS on MPS in selected insurance companies. Furthermore, ROE has no significant impact on MPS.

A study has been carried out by Dissanayake and Wickramasinghe (2016) with a sample of 30 listed companies including beverage food and tobacco, manufacturing, diversified holdings and data 2011 to 2015. The study revealed that the SP is more volatile on the PER and EPS of the company, at 1% of significance level.

Using the random sample of fourteen firms listed on the Johannesburg stock exchange from 2009-2013, Enow and Brijal (2016) have investigated the determinants of SPs. The multiple regression analysis was used. As per the study, DPS, EPS and PER have account for 57.8% of SPs movements. Furthermore, EPS and PER are significantly positively correlated to SPs although DPS do not significant.

Rubika, Jeyanthini, and Nimalatheepan (2016) have focused the pragmatic relation among SPs and explanatory variables of EPS, ROE and earning yield (EY). The

samples of ten best performing companies have been selected from the database of CSE over the period of 2009–2014. The result revealed that the EPS and ROE are positively correlated with SP at 1% significance level. The EY ratio is positively correlated with SP. From the regression analysis, it has been concluded that value relevance of EPS and EY are significant impact on SP at 1% significance level, at the same time ROE also has the significant impact on SP at 5% significance level.

Using the 20 listed companies of banking, financing, insurance, and leasing sectors in Sri Lanka, Uthayakumar and Mujahith (2016) have examined the impact of dividend policy indicators of DPR and DY, on the MPS. The study has been carried out if the period of 2010-2014. As per the study, the DPR has weak positive relationship with SP, and DY has weak negative relationship. However, DPR and DY does not have significant impact on MPS. Finally, they concluded that dividend policy is insignificant to determine the MPS for considered sector firms in Sri Lanka.

Geetha and Swaaminathan (2015) have investigated the impact of company specific variables such as EPS, firm's book value, PER and DY on firm's market price. A sample of 4 companies from the sectors of automobile and IT industries listed in Bombay Stock Exchange and National Stock Exchange of India have been chosen to carry out the analysis for the period of 2010 to 2014. The study reviled that book value, EPS and PER positively influence the MPS and its show a significant effect. But, DPS does not significantly impact on SP.

With a twenty two listed manufacturing, beverage food and tobacco companies in CSE, Sri Lanka, Irsath, Haleem and Ahamed (2015) have conducted a study to examine the impact of value relevance of accounting information on stock price. Data during the period from 2010 to 2014 have been considered. The results of their study show that EPS, DPS and net assets value per share significantly affect the stock price

Idawati and Wahyudi (2015) have conducted a study for the sample of coal mining companies in Indonesia. They have investigated the effect of ROA and EPS on SP. The panel data methods have been used to compare the regression model OLS common effect, fixed effects and random effect and FEM has been selected as the best model.

Finally, they concluded that EPS and ROA are positively correlated with stock price at 5% level of significant.

Using the samples of 41 companies under the Baharin Stock Exchange, Sharif, Purohit and Pillai (2015) have analyzed the impact of firm specific variables on SP. The pooled OLS regression with common effect method, FEM and REM have been used to estimate the appropriate model. They have found that ROE, BVS, DPS, DY, PER, and FS have significant impact on SP while EPS and debt to assets have not significant impact on SP in the Bahrain market.

Rauf (2015) has used the data of banking sector companies under the CSE in the period of 2005–2014. Correlation and linear multiple regression have been used to find out the impact of DPS, EPS, BVS, PER and FM on MPS. This study revealed that, EPS, BVS and PER show the significant positive influence on MPS; company size shows a significant negative influence on MPS. Further, DPS has insignificant impact on market price.

Alumumani (2014) has found that EPS, PER and BVS show significant positive impact on MPS while DPS and FS do not significantly convince the MPS. Analysis has been carried out with a sample of commercial banks under the Amman Stock Exchange in the period of 2005-2011 and correlation and regression techniques have been used to evaluate the results.

Menike and Prabath (2014) have undertaken a study to evaluate the impact of accounting variables on SP. With the evidence of literature, DPS, EPS and BVS have been considered as the predictor variables. 100 listed companies on CSE, Sri Lanka were considered as sample and study period was from 2008 to 2012. Multiple regressions analysis was performed to evaluate the factors that influence on SP. As per the study, EPS, DPS and BVS have significant influence on stock price and also positively related.

Sukhija (2014) has examined to find out the basic determinants which affect the SPs of S&P BSE 200 index companies in India. The study results reveled that book value,

DPS, return on capital employed and PER all are being the important determinants of SPs of all selected companies from 1998-99 to 2012-13 in the whole study period. The multiple regression analysis has been used. The study concluded that EPS, BVS and PER have significant positive impact on SP and DPS and DPR have significant negative impact on SP.

Vijitha and Nimalathasan (2014) have investigated the impact of accounting information from company financial statements on SP. The sample of twenty manufacturing firms were selected during the period of 2008 to 2012 in Sri Lanka. They have found that the accounting information of EPS, BVS, ROE and PER have significantly positive relationship with SP.

With a sample of 95 companies under the National Stock Exchange, India, Malhotra and Tandon (2013) have undertaken a study to find out the factors that influence on SPs. Data during the periods from 2007 to 2012 have been considered. The linear regression model was performed to find the results. The study results revealed that the BVS of the firm, EPS and PER have a significantly positive association with MPS of the company and DY has a significant inverse association with the MPS.

Subramaniam and Tharshiga (2013) have used ten Sri Lankan manufacturing companies' four year data from 2009 to 2012. Correlation technique and regression analysis have been used to evaluate the impact of EPS on SP. It revealed that EPS has highly positive relationship and also EPS can explained 89.7% on SP.

Using the random samples of 60 companies in Amman Stock Exchange, Allahawish and Amro (2012) have investigated the influence of internal and external factors on MPS. The correlation technique and ANOVA have been used to analysis the data. This study revealed that dividend policy, management quality, financial position, firm size and work nature of firms have an impact on SP. Further, inflation rate has high impact on SP, at the same time work nature of firm has the low impact.

Over the period 2002 to 2007, Kabajeh, Nu'aimat and Dahmsh (2012) have analyzed the impact of ROA, ROE and return on investment, jointly and independently on the

SPs of public insurance companies in Jordan. The results revealed that the ROA, ROE and return on investment have positive relationship on SPs together. Further, ROA and return on investment have positively low impact on MPS separately and ROE has no relationship on SP individually.

Khan et al. (2011) have examined the impact of dividend policy on Stock prices in Malaysia after regulating EPS, ROE and profit after tax. FEM and REM have been used to analyze the panel data for fifty five KSE-100 Index companies listed in Pakistan Stock Exchange. The data for this study were obtained in the period of 2001–2010 and the study revealed that DY, EPS, ROE and profit after tax have positive relationship with stock prices, at the same time, retention ratio is negatively related to stock prices. However, all these factors significantly explain stock price variation.

Using the samples of healthcare, auto and public sector companies in India, Nirmala, Sanju and Ramachandran (2011) have investigated the key factors influencing SPs. The study has been carried out for the period of 2000–2009 and OLS method was used. They have found that the dividend, PER and FL are the key influencing factors on SPs and they play a major role to determine the SP.

Okafor and Mgbame (2011) have undertaken a study to evaluate the impact of DY and DPR on SPs along with other control variables. The sample of 10 companies under the Nigerian market have been selected for the period of 1998–2005. Multivariate regression analysis was performed to get the results and it revealed that DPR and DY both have significant impact on SP. However, DPS has positive relationship with SP and DY has negative impact on SP changes.

Sharma (2011) has examined the relationship between SPs and explanatory variables of BVS, DPS, EPS, PER, DY, DPR and FS. The study has been carried out for the period 1993/94 to 2008/09. The study concluded that EPS, DPS and BVS have significant impact on the MPS. Furthermore, the results of the study indicated that DPS and EPS are the strongest determinants of market price.

A study has been conducted by Chowdhury and Chowdhury (2010), a sample of 77 non-financial companies traded in Dhaka Stock Exchange and Chittangong Stock Exchange of Bangladesh during period of 1999-2003. Correlation analysis and cross sectional time series FEM have been used to analyze the data. The study revealed that EPS, DPR, long term debt to total assets and current ratio have positively significant impact on SP and fixed asset turnover, FL, public shareholding, total share capital and sales growth have negatively significant impact on value of share.

Using the samples of six major commercial banks registered under the CSE, Perera and Thrikawala (2010) have published work on the relationship among EPS, ROE and EY on MPS. They found that all the explanatory variables have significant impact on MPS. They also concluded that accounting information in the financial statements published by the banking sector companies in Sri Lanka have considered as a key aspect to the investors who wish to invest in that sector.

Raza (2010) has examined the influence of company's financial performance on that company SP. Twenty companies have selected from all the sectors in Pakistan Stock Exchange for the period of 2005 to 2009. To measure the market reactions of accounting variables, the correlation and multivariate regression techniques were used. ROA, EPS, ROE, current ratio, dividend cover ratio and cash flow ratio have been considered as explanatory variables. They concluded that all the explanatory variables explain changes of 51% in the dependent. Hence, it revealed that company's financial performances have a considerable impact and influence on SP of firms in Pakistan Stock Exchange.

Over the period of 2006–2010, Velnampy and Pratheepkanth (2010) have examined the impact of EPS on SP of Milanka price index companies in Sri Lanka. In this study, 70% of the Milanka companies have positive association among EPS and price movements.

With the sample of 130 firms traded under the Nigerian stock exchange, Akintoye and Oseni (2009) have investigated the influence of accountable factors such as EPS, DPS, gross domestic product, oil price, foreign ER and lending interest rate on the MPS for

the period 2001–2007. The study found that all the accountable variables are positively associated with stock prices excluding the lending foreign ER and interest rate.

Das and Pattanayak (2009) have conducted a study to examine the factors affecting stock price movements. 30 companies from the Bombay Stock Exchange have been selected for the study. The analysis revealed that EPS, ROE, firm performance and firm valuation have positive impact on MPS. At the same time, risk and volatility have the negative impact on SP.

Using the sample of best ten percentage performers under the Shanghai Stock Exchange, China for the period of 1996–2000, Jin Dehuan and Zhenhu Jin (2008) have examined to determine the factors that influence on SPs. Simple and multiple regressions have been performed to determine the correlation of firm performance such as ROE, EPS, profit margin, ROA, sales changes and turnover from total assets on stock price. The study concluded that ROE, EPS, profit margin, ROA, sales changes and turnover from total assets have significant relationship with stock price.

Irfan and Nishat (2002) have undertaken a study to identify the factors which have impact on the SPs. The sample of 25 listed firms under the Karachi Stock Exchange in the period of 1981–2000 have selected. Cross-sectional weighted least square regression has been used to find out the impact of DY, DPR, FS, asset growth, FL and EV on SPs. The results revealed that the DPR, FS, FL and DY are significantly correlated with stock market prices in Karachi. But, asset growth and EV do not significantly correlated with the SPs.

This literatures exemplify that many internal factors have affected the MPS. While much literature existed about foreign stock exchanges and foreign companies, unfortunately very few scholars have focused on the Sri Lankan companies and CSE around this topic. The reviewing of previous studies related to SP have provided the justification to this study to be conducted.

This study seeks to provide new support for the investors in the diversified financial companies in CSE. In contrast to the previous studies which are conducted to find out

the most influencing accounting information to determine the MPS in diversified financial companies. Therefore, this study has sought to examine whether ROA, ROE, BVS, EPS, DPS and DY have their influence to determine the MPS for the diversified financial companies in CSE.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter discusses methods adopted to achieve the objectives of this study. Methodology was based on the overall consensus of existing literature in the field of this study. Four sections are in this chapter including this introduction. Details of sample, sources of data and data collected are discussed in the second section. Information regarding model fitting are given in the section three. Details about the software used for the analysis are in the last section.

3.2 Data Collection

Data for this study were gathered from a random sample of 24 companies listed in the Colombo Stock Exchange (CSE) under the Diversified Financials sector for the period from 2014 to 2019 from the annual reports and financial statements of the selected companies', published in the CSE website, namely www.cse.lk.

Table 3.1 shows abbreviations for the variables used in this study.

Table 3.1: Abbreviations of variables

Variables	Abbreviation
Independent Variables	
Return on Asset	ROA
Return on Equity	ROE
Book Value per Share	BVS
Earnings per Share	EPS
Dividend per Share	DPS
Dividend Yield	DY
Dependent Variable	
Market Price of Share	MPS

ROA, ROE, BVS, EPS, DPS and DY were considered as the internal factors and MPS was used as the response.

3.3. Analysis

Main objective of this study was to identify determinants of share price for diversified financial companies listed in Colombo stock exchange from some suspected factors. Therefore, this study investigated the following null hypotheses through a selected statistical model.

H_1: Return on assets does not affect market price of share in the diversified financial companies listed on the CSE.

H_2: Return on equity does not affect market price of share in the diversified financial companies listed on the CSE.

H_3: Book value per share does not affect market price of share in the diversified financial companies listed on the CSE.

H_4: Earnings per share does not affect market price of share in the diversified financial companies listed on the CSE.

H_5: Dividend per share does not affect market price of share in the diversified financial companies listed on the CSE.

H_6: Dividend yield does not affect market price of share in the diversified financial companies listed on the CSE.

Details of the statistical models and procedures followed in selecting an appropriate model are discussed below.

3.3.1 Model fitting

Since, identification of determinants of market price of share from a selected set of factors: return on asset; return on equity; book value per share; earnings per share;

dividend per share; and dividend yield, was the objective of the study; and an appropriate model was selected through several types of models.

The collected data were in the form of panel data because data were collected for each year in the period from 2014 to 2019 from randomly selected 24 companies. Data in this form may consist of different types of effects such as time effects, fixed effects and random effects. Therefore, models with different combinations of these effects ought to be tested for these data.

The linear functional technique has been generally used studies in the literature and provides better results. Most of the share price researches have used regression models to estimate the effects of different variables which could be significant in explaining market share price. Therefore, in this study also, multiple linear regression technique was used to form the models.

3.3.2 Linear Multiple Regression Model

In order to test determinants of share price for diversified financial companies in CSE, models in the following linear form were considered.

$$MPS = \alpha_0 + \beta_1 ROA + \beta_2 ROE + \beta_3 BVS + \beta_4 EPS + \beta_5 DPS + \beta_6 DY + \varepsilon \quad \ldots\ldots\ldots (3.1)$$

where:

$\boldsymbol{\alpha_0}$ is intercept;

$\beta_1, \beta_2 \ldots \beta_6$ are regression coefficients;

ε is error term.

This linear regression model is based on the following assumptions.

3.3.3 Assumptions of Regression Model

Linear relationship between predictors and response

An important assumption of regression models postulates that relationship between the dependent and independent variables should be linear. The widely used approach for

testing this assumption is to map residuals of the regression on the axis of vertical against corresponding data points of the independent variable on the axis of horizontal. According to Berenson et al., (2012), if the linear model is suitable for the data, it will not see any apparent pattern in the plot. Nevertheless, if the linear model in the residual plot is not acceptable, there will be a relation between the values and the residuals. Simply stated, the model is in linearity since there is no apparent grouping of negative residuals or grouping of positive residuals.

Normal distribution of variables

The normality of data is one of essential assumptions of regression models. In this study, the following tests can be performed to determine if variables follow a normal distribution.

Anderson-Darling Normality Test

The Anderson-Darling normality test is used to test if a sample of data came from a population with a normal distribution. It is a modification of the Kolmogorov-Smirnov (K-S) test. When applied to testing whether a normal distribution adequately describes a set of data, it is one of the most powerful statistical tools for detecting most departures from normality

The two hypotheses for the Anderson-Darling test for the normal distribution are given below:

H_0: The data follows the normal distribution.
vs
H_1: The data do not follow the normal distribution.

The Anderson-Darling test statistic is defined as;

$$A^2 = -N - S \qquad \text{..... (3.2)}$$

where,

$$S = \sum_{i=1}^{N} \frac{(2i-1)}{N} [\ln F(Y_i) + \ln(1 - F(Y_{N+1-i}))] \qquad \text{..... (3.3)}$$

F is the cumulative distribution function of the specified distribution and N is the sample size.

Jarque-Bera Test

This normality test is fairly straightforward as well. The basic concept is that it checks data's skewness and kurtosis to see if it fits what a normal distribution would expect from that. Larger the value of Jarque-Bera statistic revels that more data diverges from the normal.

JB test statistics is defined as;

$$JB = n\left[\frac{(\sqrt{b_1})^2}{6} + \frac{(b_2 - 3)^2}{24}\right] \quad \ldots\ldots (3.4)$$

where, n is the sample; $\sqrt{b_1}$ is the sample skewness coefficient and $b_2$is the kurtosis coefficient.

Independence among predictors

The most major issue surrounding the use of the multiple regression model is the correlation between the used independent variables in the model. If the correlation coefficient value is large, multicollinearity problems may result in the coefficients being unable to be estimated with extreme accuracy.

Inconsistent multicollinearity's effects can be categorized as follows:

a. Estimates of the coefficients for ordinary least-square cannot be accurate in the way that high standard errors result in wider intervals of confidence.
b. Because of small value of T-statistics, the statistical significance would not be gain for affected variables that can also lead an important variable to fall from the regression model wrongly.
c. Signs of the coefficients calculated can be the opposite of what is expected.
d. The inclusion as well as omission of some data will lead to major differences in the estimated coefficients.

There are a few tests that can be performed to determine the multicollinearity problem. The first requires analyze the matrix of correlation to decide whether or not the independent variables are significantly correlated to each other. Detection of multicollinearity problem can also be performed using the Variance Inflation Factor (VIF). The VIF is commonly used in a regression model to calculate the degree of multicollinearity of the independent variable against the other independent variables. It has been suggested that in thumb law, if the variable's VIF crosses 5, the variable is considered to be extremely collinear.

Variance inflation factor is defined as;

$$VIF_j = \frac{1}{1 - R_j^2} \qquad \text{(3.5)}$$

where, VIF_j is the variation inflation factor for variable X_j and R_j^2 represent the coefficient of determination for variable X_j.

$$R_j^2 = \frac{n\left(\sum X_{except\ X_j} X_j\right) - (\sum X_{except\ X_j})(\sum X_j)}{\sqrt{\left[n\sum X_{except\ X_j}^2 - (\sum X_{except\ X_j})^2\right]\left[n\sum X_j^2 - (\sum X_j)^2\right]}} \qquad \text{(3.6)}$$

This coefficient of determination calculating by regressing the j^{th} independent variable on all of the other independent variables. So, treat X_j as the dependent variable and use the other independent variables to predict X_j.

Normality of residuals

One of regression model's major assumptions is that the residuals are normally distributed. The residuals of the regression should adopt a normal distribution to allow appropriate inferences from the regression. The residuals are actually the error terms, or the variations between the observed and predicted values of dependent variable. If the residuals are normally distributed or not can be evaluated by plotting a normal Predicted Probability (P-P) plot. Standard normality tests can also be used to examine the normality of the residuals.

Homoskedasticity of residuals

Another assumption of regression model is that interference in the regression equation are homoskedastic and its variance should be constant. Getting an equivalent variance thus means that perturbations are homoskedastic. Nevertheless, it is very normal to have situations where the assumption is violated in the regression analysis. In general, the heteroscedasticity problem is likely to be more frequent in cross sectional data than in data in time series. It does not however mean that heteroskedasticity is unlikely in time series models.

The existence of heteroscedasticity is a problem when applying regression analysis, since the presence of heteroscedasticity may nullify the significance of statistical tests.

Asteriou, and Hall (2007) noted:
The ordinary least square (OLS) estimators have certain implications of heteroscedasticity: In the case where the error term is *e*; the equation is understood to be heteroscedasticity in this regression, and then the effects on the estimators of ordinary least square can be categorized as follows:

1. The OLS estimators tend to be unbiased and consistent. This is that there is no correlation between either of the predictor variables and the error term.
2. Heteroskeletality influences the increasing distribution variances of distribution and thus makes the OLS method estimators inefficient.

3. Heteroskedasticity also impacts the predicted variances, and thus the standard errors. Nonetheless, the existence of heteroskedasticity forces the OLS approach to underestimate the variances and standard errors that lead to higher than expected values of T-statistics and F-statistics.

The heteroscedasticity problem could be overcome by using White's heteroscedasticity adjusted standard errors. The E-Views software permitted to obtain White's heteroscedasticity rectified standard errors and covariance to fix heteroscedasticity problem automatically.

Independence of errors

The classical regression model's one of the assumption is the independence of the disturbance from one observation to another. If this assumption is violated, then the errors in the one time period correspond with their own values in other periods and the problem of autocorrelation is also often pointed as serial correlation strictly auto-correlated errors or disturbance.

The effects of autocorrelation can be explained in the following points on the OLS estimators.

Asteriou and Hall (2007):

1. The estimators of ordinary least square tend to be unbiased and consistent.
2. The OLS estimators are going to be unreliable and no longer BLUE.
3. The calculated variances of the coefficients of regression are biased and contradictory, and hypothesis testing can't be accurate any more. In most cases, R^2 and t-statistics values tends to be overestimated.

To detect the presence of autocorrelation, the Durbin-Watson test statistic is widely used. In the Durbin-Watson statistic, the null hypothesis is that the residuals of OLS regression are not auto-correlated. The value ranges for the Durbin-Watson statistical coefficient from zero to 4. The test statistics *d* is compared to the critical values of lower and upper (d_L and d_U) at significance level α.

The test statistics is:

$$d = \frac{\sum_{i=2}^{n}(e_i - e_{i-1})^2}{\sum_{i=1}^{n} e_i^2} \quad \text{……} (3.7)$$

$$e_i = y_i - \hat{y_i} \quad \text{……} (3.8)$$

where y_i and $\hat{y_i}$ are the observed value and predicted value of the response variable for individual *i* respectively. When the serial correlations increase then *d* becomes smaller. Upper and lower critical values of d_U and d_L have been systemized for different k values (the number of explanatory variables) and n values (number of samples).

a. The value of $d < d_{L,\alpha}$, statistical evidence exists that errors are autocorrelated positively.
b. The value of $d > d_{U,\alpha}$, no statistical evidence exists that errors are autocorrelated positively.
c. The value of d falls between the critical values of lower and upper ($d_{L,\alpha} < d < d_{U,\alpha}$), the result implies that it is inconclusive test.
d. The value of $(4 - d) < d_{L,\alpha}$, statistical evidence exists that errors are autocorrelated negatively.
e. The value of $(4 - d) > d_{U,\alpha}$, no statistical evidence exists that errors are autocorrelated negatively.
f. The value of $(4 - d)$ falls between the critical values of lower and upper ($d_{L,\alpha} < (4 - d) < d_{U,\alpha}$), the result implies that it is inconclusive test.

It can be strongly accepted that there is no autocorrelation if the Durbin-Watson value of the regression *d* is positioned between the values of $d_{L,\alpha}$ and $d_{U,\alpha}$.

3.3.4 Remedial Actions for Violation of Assumptions

Transforming is typically implemented in such a way that data tends to follow the assumptions of a statistical inference approach to be implemented more closely, or to enhance the interpretability or transparency of graphs. The method used to transform the data is almost always invertible, and is usually continuous.

The transformation of non-normally distributed data into a normal distribution is accomplished in various ways. Since variables did not follow normal distribution, in this study, the Yeo–Johnson power transformation was used to transform the data. It is an extension of Box-Cox transformation and it allows transformation of zero and negative values also.

Since variables did not follow normal distribution, the following Yeo – Johnson power transformation was used to transform variables to meet normal patterns.

$$y_i^{(\lambda)} = \begin{cases} ((y_i+1)^{\lambda}-1)\ /\lambda & if\ \lambda \neq 0, y \geq 0 \\ \log(y_i+1) & if\ \lambda = 0, y \geq 0 \\ -[(-y_i+1)^{(2-\lambda)}-1]/(2-\lambda) & if\ \lambda \neq 2, y < 0 \\ -\log(-y_i+1) & if\ \lambda = 2, y < 0 \end{cases} \quad \ldots\ldots\ldots\ldots\ldots\ldots (3.9)$$

Here λ can be any real number, where $\lambda = 1$ produces the identity transformation. Appropriate value of λ was selected for each variable by testing the normality of transformed data with different λ value.

3.3.5 Model for panel data

Since data in the panel form consist of various types of effects, models with different combinations of these effects have been fitted and tested for eligibility.

Pooled ordinary least squares

This method considers all cross-sectional units to have a constant intercept. The intercept value and the coefficients of all the explanatory variables (both the slope and the intercept) are the same for all the companies in the pooled estimation method as is the fact that they are constant over time. This method of estimating disregards any type of heterogeneity across units. In other terms, if Heterogeneity is observed for all individuals, this means that for all units there is only the constant term, and then the entire model can be considered as an ordinary linear model and fit by least squares.

The pooled model is defined according to the following regression model:

$$\mathbf{Y_{it} = \alpha_0 + \beta X_{it} + \varepsilon_{it}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.10)$$

where:

Y_{it} is the response of i^{th} company at time t;

α_0 is the intercept;

β is the vector of coefficients;

X_{it} is the vector of k explanatory variables of i^{th} company at time t;

ε_{it} is the error term of the i^{th} company at time t.

Assumptions behind the pooled method are that the explanatory variables are non-stochastic and that errors follow the traditional assumptions, i.e. there is a zero mean value of error term, there is no serial correlation among errors, there is the case of homoscedasticity or equal variance of the errors, there is no covariance between disturbance and the explanatory variables.

This study uses fixed effect model (FEM) and random effect model (REM) too to overcome the drawbacks of using the pooled methods.

Fixed effects model

The fixed effect models take into account of cross-sectional unit's individuality by allowing the intercept to differ for each company, but the assumption of a slope coefficient is constant across companies. In other words, the FEM assumes that intercept varies over cross-sectional units, each unit has its own fixed, and the unique intercept and intercept variations represent the unidentified differences between these cross-sectional units. As noted by Gujarati (2003):

> The fixed effects estimation method believes that intercepts differ across organizations but that each particular intercept does not change over time or time invariant. These variations in company intercepts are due to specific characteristics of each organization, such as corporate culture or managerial ideology.

The fixed effects model is defined according to the following regression model:

$$\mathbf{Y_{it} = \alpha_i + \beta X_{it} + \varepsilon_{it}} \quad \text{..... (3.11)}$$

where:

Y_{it} is the response of i^{th} company at time;

α_i is the intercept for company *i*. (*i = 1,..., N*) is a constant coefficient specific to each company;

β is the vector of coefficients;

X_{it} is the vector of k explanatory variables of i^{th} company at time;

ε_{it} is the error term of the i^{th} company at time t.

The subscript *i* in the intercept term is to clarify that the intercept of each company included in the study may be different. In order to validate the fixed effects specification, it is important to test whether or not the individual coefficients α_i , $i=1,\ldots,N$, are not all equal. The assumptions underlying fixed effect models are the same as for pooled models except for the intercept that can differ across the organization and so on in the models with fixed effects while in the pooled models it is constant.

Commonly, the following problems that apply to the fixed effects model: Introducing too many dummy variables will result in running up against the degree of freedom. There is also the chance of multicollinearity, with so many variables in the model. The approach to fixed effects may not be able to assess the influence of time-invariant variables such as colour, age and ethnicity. Thus, the model of random effects can be used to solve the model problems of the fixed effects.

Random effects model

In the error component, individual specific effects in the random effect model appear as a random disturbance that is the same for each observation in a given sample that is here for a given company, but is random across samples. One component of the total disturbance term is the individual specific disturbance (Murray, 2006). In other terms, REM allows the intercept to differ between units, but variation is treated as arbitrarily selected, so this model prevents lack of degrees of freedom as opposed to the FEM. The generalized least squares estimator is a combination of variation among the group and within a group.

The random effects model is defined as follows:

$$\mathbf{Y}_{it} = \boldsymbol{\alpha}_i + \boldsymbol{\beta}\mathbf{X}_{it} + \mathbf{v}_i + \boldsymbol{\mu}_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{(3.12)}$$

where:

Y_{it} is the response of i^{th} company at time t;
α_i is the intercept for i^{th} company;
β is the vector of coefficients;
X_{it} is the vector of k explanatory variables of i^{th} company at time t;

v_i is the company -specific random effect;

μ_{it} is the individual-specific random effect.

3.3.5.1 Selection of appropriate panel model

Hausman test

Gujarati (2003) and Wooldridge (2001) have stated that if the error term and the regressors are uncorrelated, the REM may be appropriate, whereas if the error and the regressors are correlated, the FEM may be appropriate. The difference between the fixed and the random variable is that every cross-sectional unit has its own (fixed) intercept value within the fixed effects model. The intercept, however, represents the mean value of all (cross- sectional) intercepts in the random effects model, and the error component v_i represents the deviation of each individual intercept from that mean value.

The Hausman test is used to select the appropriate model between the models of fixed effects and the random effects. The following hypotheses is tested with the Hausman test.

H_0: The most appropriate model to use is the random effect model.

vs

H_1: The most appropriate model to use is the fixed effect model.

Rejecting the null hypothesis means that it is not appropriate to use the random effect model and that it is better to use the fixed effects model.

The Hausman test statistic follows the statistical distribution of Chi Square with degree of freedom as k-1, where k is the total number of variables of the sample. If the calculated value of Hausman statistic is higher than the critical value of chi square then null hypothesis is cannot be accepted and the fixed effects model is appropriate for the estimation while the opposite when the calculated value of the Hausman statistic is lower than the critical value then the random effects model is appropriate.

$$\boldsymbol{y = bX + e} \quad \text{..... (3.13)}$$

According to the linear model where y is the response variable and X is vector of predictor variables, b represent the vector of coefficients and e is the error term. Terms b_0 and b_1 are the two estimators of coefficient b. Both two estimators are consistent under the null hypothesis, but b_1 is efficient which has the lowest asymptotic variance, at least in the class of estimators containing b_0. However, b_0 is consistent, under the alternative hypothesis whereas b_1 isn't.

The test statistics is:

$$\boldsymbol{H = (b_1 - b_0)'\left(Var(b_0) - Var(b_1)\right)^{\dagger}(b_1 - b_0) \sim \chi^2_{k-1}} \quad \text{..... (3.14)}$$

where † denotes the Moore–Penrose pseudoinverse.

Chow test

The Chow test can determine if there are differences between two hedonic regressions, the term used for the models estimated with observed data. The Chow test is a special form of a dummy variable tests and model as it accounts for fluctuating data in a sample, without the need to construct intercept or interaction dummies.

Chow test is a tool to decide the most appropriate model. For the panel data estimation, this test used to determine whether ordinary least square model or fixed effects model is suitable for the data panel. The hypothesis of the chow test is:

H_0: The most appropriate model to use is the ordinary least square.
vs
H_1: The most appropriate model to use is the fixed effect model.

The test statistics is:

$$F = \frac{\left(\frac{(SSE1 - SSE2)}{(n-1)}\right)}{\left(\frac{SSE2}{(nt-n-k)}\right)} \quad \text{.....(3.15)}$$

where:

SSE1 is the sum square error from model ordinary least square;

SSE2 is the sum square error from fixed effect model;

n is number of companies (cross section);

nt is total cross section * total of time series;

k is number of independent variables.

To compare with the value of F table, it can use the following formula:

$$F = [\alpha; df(n-1, nt-n-k)] \quad \ldots\ldots (3.16)$$

where, α is the significance level used.

Lagrange multiplier test

Lagrange Multiplier (LM) test for the number of independent variables is based on the chi-squares distribution with degree of freedom. If LM statistic calculated value is greater than the chi-squares statistic critical value then the null hypothesis cannot be accepted, It means that the model of random effects of the model ordinary least square is a reliable estimate for the panel data regression model Inversely, if the LM statistic calculated value is lower than the critical value of chi-squares statistic, then the null hypothesis can be accepted, which implies that the estimates used in the panel data regression model of ordinary least square is not random effects model. LM is a test to decide if the model of random effects or the ordinary least square model is best fit to analyze the panel data. The null and alternative hypothesis of the Lagrange Multiplier test is as follows:

H_0: The most appropriate model to use is ordinary least square model.
vs
H_1: The most appropriate model to use is the random effect model.

Rejecting the null hypothesis means that it is not appropriate to use the ordinary lease square model and that it is better to use the random effect model.

3.4 Software

The collected data were analyzed using the software of E-Views version 11 and Minitab 17. Because of its intrinsic features over cross sectional data, panel data have been constructed.

E-Views offers several special methods for dealing with a stacked data of panel structure. If the work file has been organized as a panel work file, the E-Views software can be used to deal with panel data and estimate equation parameters. The required models have generated from E-Views and the appropriate model also has found from this software.

In Minitab software, data input is simplified, which can be used to facilitate statistical analysis and to manage dataset. The assumptions of regression model have tested from this software It provides graphs, shapes and diagrams that are evaluated and interpreted, so its helps to make final conclusions.. To get more assurance in analyzing the data using the panel structure, the statistical packages of E-Views and Minitab were employed.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This chapter contains the results of this study. Section 4.2 presents summary of the variables used in this study. Section 4.3 presents descriptive statistics of the variables for original data and transformed data. Details of model fittings and identification of factors on which market price of share is dependent are given in section 4.4. And this section also contains the results of statistical tests of assumptions. Section 4.5 presents the determinants of market price of share.

4.2 Abbreviations for Variables

Table 4.1 summarizes abbreviation of variables used in the analysis.

Table 4.1: Summary of variables

	Variables	**Abbreviation**
Dependent Variable	Market Price of Share	MPS
Independent Variables	Return on Asset	ROA
	Return on Equity	ROE
	Book Value per Share	BVS
	Earnings per Share	EPS
	Dividend per Share	DPS
	Dividend Yield	DY

4.3 Descriptive Statistics

Table 4.2 reports the descriptive statistics of the variables. Key figures, including mean, median, mode, standard deviation, skewness and kurtosis value are reported.

Table 4.2: Descriptive statistics of each variable.

Variables	Mean	Median	Standard Deviation	Skewness	Kurtosis
MPS	282.61	114.20	385.99	2.23	4.95
ROA	3.80	3.41	2.64	0.77	0.32
ROE	11.77	12.84	6.54	-0.19	-0.44
BVS	250.44	163.32	278.89	2.16	4.51
EPS	16.50	12.57	13.24	0.98	0.42
DPS	2.30	2.00	1.45	1.49	3.24
DY	2.90	2.59	2.03	1.16	0.87

Table 4.2 shows the following information, with respect to the dependent variable, the diversified financial companies in CSE have an average MPS of 282.61 and have a standard deviation of 385.99 over the entire period from 2014 to 2019 and at the same time, they have MPS median value of 114.20. A difference can be found between mean and median. And comparably a very high value of standard deviation indicates that data points have spread out from mean value. Selected companies have MPS skewness of 2.23 and MPS kurtosis of 4.95. This means that distribution is skewed to the right with heavy outliers.

ROA values of these 24 selected companies during the selected period have distributed with mean of 3.80 and standard deviation of 2.64 which means that data points are not closer to mean value. The median of 114.20 reveals a huge difference between mean and median. ROA has the skewness of 0.77 which means that these distribution is little skewed to right and kurtosis of 0.32 means the distribution is with small tail.

The variable ROE has distributed with mean of 11.77 and standard deviation of 6.54 for 24 selected companies. This standard deviation means that data points have deviated from mean value. At the same time, ROE has median value of 12.84; skewness and kurtoses of -0.19 and -0.44 respectively. When mean and median are

different and negative skewness and kurtosis are present. Then it is likely that data are not symmetrical but are skewed to the left with lighter tail and flat peak.

With respect to BVS, the selected companies have an average of 250.44 and standard deviation of 278.89 over the considered period. Also the data not symmetrically distributed because of their median value is 163.32. Therefore, a difference between mean and median can be found. A high standard deviation means that the data set values are farther from the mean. The skewness of 2.66 and kurtosis of 4.51 indicate that the distribution is skewed to the right with heavy tails.

EPS has distributed with mean of 16.50 and standard deviation of 13.24. The median value of 12.57 varies from the mean value. So, a difference can be found. The standard deviation revels that the data points are in the distance from mean value and also the data points are skewed to the left with lighter tail because EPS has the skewness and kurtosis of 0.98 and 0.42 respectively.

DPS values of 24 selected companies over the period from 2014 to 2019 show an average of 2.30 and standard deviation of 1.45. The median value of 2.00 reveals a difference between mean and median. The standard deviation value of DPS is low compared to the other variables but it is not negligible. So, some data points are in interspace from mean value. The skewness of 1.49 indicates DPS distribute with right skewed and the kurtosis of 3.24 indicates that distribution with bell-shaped tail.

Variable DY has distribute with mean of 2.90 over the selected period and standard deviation of 2.03. The standard deviation implies that data points stand out from mean value. Moreover, the distribution has median, skewness and kurtosis values of 2.59, 1.16 and 0.87 respectively. A smaller difference can be found between mean and median values also that difference is considerable. Then it is likely the data is not symmetrical but is skewed to the right with small tail.

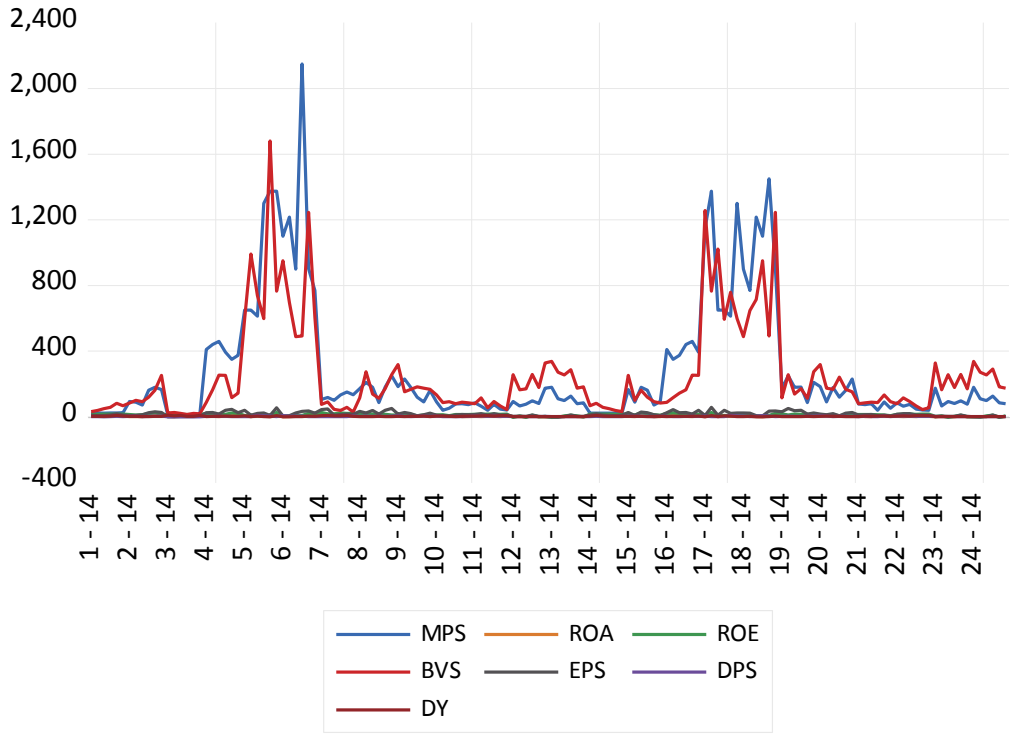

Figure 4.1: Trend chart of variables

As the Figure 4.1 shows that the variables of market price of share, return on asset, return on equity, book value per share, earnings per share, dividend per share and dividend yield have no trend in the data set.

4.3.1 Transformation of data

The study has resorted to Yeo–Johnson transformation for the dependent and independent variables. Table 4.3 shows the lambda values used for the transformation.

Table 4.3: Yeo–Johnson power transformation lambda values

Variables	Lambda Value	New Abbreviation
Market Price of Share	-0.15	YJ_MPS
Return on Asset	0.31	YJ_ROA
Return on Equity	1.34	YJ_ROE
Book Value per Share	-0.1	YJ_BVS
Earnings per Share	0.5	YJ_EPS
Dividend per Share	-0.3	YJ_DPS
Dividend Yield	-0.19	YJ_DY

4.3.2 Descriptive statistics for transformed data

Descriptive statistics of the transformed variables are shown in Table 4.4.

Table 4.4: Descriptive statistics of transformed data

Variables	Mean	Median	Standard Deviation	Skewness	Kurtosis
YJ_MPS	3.43	3.40	0.58	-0.21	-0.18
YJ_ROA	1.84	1.89	0.92	-0.03	-0.69
YJ_ROE	23.43	23.49	0.90	0.26	-0.22
YJ_BVS	3.94	4.00	0.59	-0.13	-0.07
YJ_EPS	5.71	5.37	0.25	0.10	-0.40
YJ_DPS	0.93	0.94	0.29	0.03	-0.44
YJ_DY	1.09	1.14	0.39	-0.10	-0.35

For transformed dependent variable of YJ_MPS, the selected 24 diversified financial companies show a mean of 3.43 and standard deviation of 0.58 over the period from 2014 to 2019. Standard deviation is low and which deviation indicates that the data points are closer to mean value. And also, they have a median of 3.40. The difference between mean and median is very low. Moreover, they have the skewness of -0.21 and kurtosis of -0.18. These values indicate that the distribution is very slightly skewed to the left with lighter tail.

Variable of YJ_ROA has a mean of 1.84 and standard deviation of 0.92 in this period. And also, they have a median of 1.89. Which values show that low standard deviation and a difference between mean and median is 0.05. This indicates that the data points are intimate to mean value and the values of mean and median are very close. The values of skewness and kurtosis are -0.03 and -0.69 respectively and skewness is approximately equal to zero. Therefore, this is a symmetric distribution with no skewness and lighter tail.

The variable YJ_ROE has distributed with mean of 23.43 and standard deviation of 0.90 over the period from 2014 to 2019. The low standard deviation implies that data

points have not deviated from mean value. The median value of 23.49 reveals the difference of 0.06 with mean. That is very small and negligible. This distribution is slightly skewed to the left with smaller tail because skewness and kurtosis have the values of -0.26 and -0.22 respectively.

YJ_BVS has distributed with mean of 3.94 and standard deviation of 0.59. The smaller value of standard deviation indicates that data points are near to mean value. And also, the median of 4.00 is very closer to the mean value. The difference between mean and median is 0.06. The transformed BVS have the skewness of -0.13 and kurtosis of -0.07 which indicate that the distribution is very slightly skewed to the left with small peak.

Variable YJ_EPS, has a mean of 5.71 and standard deviation of 0.25. The difference between mean and median of 5.37 is 0.34. This small difference value reveals that the distribution can be symmetrically distributed. It has the standard deviation of 0.25 and low standard deviation indicates that the data points are not far away from mean value. Also, the skewness of 0.10 and kurtosis of -0.40 reveal that the distribution is very slightly skewed to the right with lighter tail.

With respect to YJ_DPS, the selected companies have a mean of 0.93 and standard deviation of 0.29 in the period considered. This standard deviation value of DPS is indicates that the data points are intimate to mean value. And also, they have a median of 0.94. The difference between mean and median is 0.01 which is nearly closer to zero and distribution has skewness and kurtosis of 0.03 and -0.44 respectively. It is likely the data is symmetrical but it is little skewed to the right with small tail.

The variable YJ_DY, shows a mean of 1.09, standard deviation of 0.39 and median of 1.14. The difference between mean and median value is 0.05 which is very low value and indicates that both points are approximately same. So, the distribution can be symmetrically distributed. The low standard deviation indicates that the data points are closer to mean value. The skewness and kurtosis values of this distribution are -0.10 and -0.35 respectively. These values indicate that the distribution is very slightly skewed to the left with lighter tail.

4.4 Fitting the Models

The types of panel analytic models are pooled ordinary least squares, fixed effect models, and random effects models. Various tests were carried out using E-Views software and Minitab software to figure out the appropriate model. Table 4.5 below shows results of the panel data for three recommended models: pooled ordinary least squares (POLS), fixed effect models (FEM) and random effects models (REM).

Table 4.5: Results of pooled ordinary least squares, fixed effects model and random effects model with YJ_MPS as response

Independent Variable	**POLS**	**FEM**	**REM**
C	0.5394* (0.0077)	2.2803* (0.0000)	1.7735* (0.0000)
YJ_ROA	0.0128 (0.6255)	0.0373* (0.0193)	0.0327* (0.0348)
YJ_ROE	0.0065* (0.0004)	0.0031* (0.0023)	0.0035* (0.0005)
YJ_BVS	0.6714* (0.0000)	0.3096* (0.0000)	0.4333* (0.0000)
YJ_EPS	0.0424* (0.0000)	0.0281* (0.0000)	0.0320* (0.0000)
YJ_DPS	0.1931* (0.0107)	0.0922* (0.0444)	0.1043* (0.0182)
YJ_DY	-0.2810* (0.0000)	-0.2929* (0.0000)	-0.3232* (0.0000)
R^2	0.8728	0.9794	0.6651
F	156.6549 (0.0000)	187.2170 (0.0000)	45.3554 (0.0000)
N	144	144	144

Values in brackets below the coefficient are the probability levels of significance. * indicates significance at 5% significant level.

4.4.1 Selection of model

Breusch-Pagan Lagrange multiplier test

The Breusch-Pagan Lagrange multiplier test was used to choose the best model between pooled ordinary least square and panel random effect model. The table 4.6 shows the test statistic value and p-value of Breusch-Pagan Lagrange multiplier test.

Table 4.6: Result of Breusch-Pagan Lagrange multiplier test

Chi-square statistic	Probability
109.2054	0.0000

With the high chi-squared statistics, p-value is less than 0.05. So, the null hypothesis is rejected at 5% level of significance.

H_0: The most appropriate model to use is pooled ordinary least square model.
vs
H_1: The most appropriate model to use is the random effect model.

Therefore, the panel random effect model can be selected. The Lagrange multiplier test results favour panel random effect model over pooled ordinary least square estimation model.

Chow test

To choose between pooled ordinary least square and panel fixed effect model, Chow test was used. The following results are observed, with the panel that reports the Chow test results shown in the table 4.7.

Table 4.7: Result of Chow test

F-statistic	Probability
25.7035	0.0000

Depending on the results of the chow test using sums-of-squares (F-test), p-value is less than 0.05. So, the null hypothesis is rejected at 5% level of significance.

H_0: The most appropriate model to use is the pooled ordinary least square.

vs

H_1: The most appropriate model to use is the fixed effect model.

Therefore, the fixed effect model can be selected. The joint significance results favour fixed effect model over the pooled ordinary least square model.

Hausman test

The Hausman test was used to determine whether the panel random effect model or panel fixed effect model is most appropriate. Hausman test results shown in the table 4.8.

Table 4.8: Result of Hausman test

Chi-square statistic	Chi-square degrees of freedom	Probability
46.605075	6	0.0000

Based on the results of the Hausman test, here p-value is less than 0.05. So, the null hypothesis is rejected at 5% level of significance.

H_0: The most appropriate model to use is the random effect model.

vs

H_1: The most appropriate model to use is the fixed effect model.

Therefore, the fixed effect model can be selected. Hence, FEM is appropriate for selected panel data.

Selected model

Based on the findings of Breusch Pagan Lagrangian multiplier test shown in Table 4.6, chow test shown in Table 4.7 and Hausman test shown in Table 4.8, it can be concluded that fixed effect model is appropriate and it should be used.

Table 4.9 includes the details about the determinants of share price for the diversified financial companies in Colombo Stock Exchange. The Yeo–Johnson power

transformed variables of YJ_ROA; YJ_ROE; YJ_BVS; YJ_EPS; YJ_DPS; and YJ_DY are significant at 5% level of significance.

Table 4.9: Results of fixed effect model

Independent Variable	**FEM**
C	2.2803* (0.0000)
YJ_ROA	0.0373* (0.0193)
YJ_ROE	0.0031* (0.0023)
YJ_BVS	0.3096* (0.0000)
YJ_EPS	0.0281* (0.0000)
YJ_DPS	0.0922* (0.0444)
YJ_DY	-0.2929* (0.0000)
R^2	0.9794
F	187.2170 (0.0000)
N	144

Values in brackets below the coefficient are the probability levels of significance. * indicates significance at 5% significant level.

The selected model is:

$$YJ\_MPS = 2.2803 + 0.0373 * YJ\_ROA + 0.0031 * YJ\_ROE + 0.3096 * YJ\_BVS + 0.0281 * YJ\_EPS + 0.0922 * YJ\_DPS - 0.2929 * YJ\_DY \ldots\ldots\ldots\ldots (4.1)$$

4.4.2 Assumptions of model

Statistical test for normality

Table 4.10 provides the Anderson-Darling test results for the transformed independent variables. This was used to determine if a data set follows normal distribution.

Table 4.10: Result of Anderson-Darling test

Variables	A-Squared Value	P-Value
YJ_ROA	0.69	0.070
YJ_ROE	0.64	0.091
YJ_BVS	0.61	0.110
YJ_EPS	0.43	0.311
YJ_DPS	0.68	0.073
YJ_DY	0.47	0.245

According to the results of the Anderson-Darling test, all p-values are greater than 0.05. Therefore, the null hypothesis cannot be rejected at 5% level of significance and it can be concluded that all independent variables follow normal distribution.

Graphical test for normality

The boxplots and the probability plots of the transformed independent variables are shown in the Appendix (A) and (B) respectively. The boxplot indicates that no outliers in the graphs and it looks like symmetric. The probability plot shows that the existing points always follow and approach the diagonal line.

It can be concluded that the variables which were used in the analysis are normally distributed. Therefore, the potential of making decision based on selected regression model's results is allowed.

Testing for multicollinearity

This study was employed the variance inflation factor (VIF) for all significant independent variables to investigate whether there is a multicollinearity among the

variable used in the model. Table 4.11 presents the VIF values among the significant independent variables in the model to test multi-collinearity.

Table 4.11: Values of variance inflation factor and tolerance for model variables

Variables	Collinearity Statistics	
	Tolerance	VIF
YJ_ROA	0.5487	1.8224
YJ_ROE	0.4440	2.2523
YJ_BVS	0.5004	1.9986
YJ_EPS	0.3697	2.7053
YJ_DPS	0.6865	1.4567
YJ_DY	0.5715	1.7497

Tolerance for the variables are between (0.3697 and 0.6865). Variance inflation factors (VIF) is equal to 1/ tolerance. VIF values are between (1.4567 and 2.7053) for the variables used in the model. These values are all below 5. So it can be concluded that among the independent variables, there is no multicollinearity.

Testing for linearity

To test the linearity of the variable, the scatter plot was plotted between the dependent variable and independent variable. Appendix (C) displays the scatter plots of YJ_MPS versus each independent variable. The figures of C-1, C-2, C-3, C-4, C-5 and C-6 indicate that there is a linear relationship between the dependent variable and each independent variable.

Testing for autocorrelation

To detect the presence of autocorrelation, the Durbin Watson test was used. This test's null hypothesis is that residuals are not linearly auto-correlated. The model provides the Durbin-Watson statistics value is 0.964. The lower and upper critical values are 0.837 and 2.035 at 5 percent significance level. Therefore, the Durbin-Watson statistics value located between critical values. This result suggests that there is no evidence of first order serial correlation presence in the model.

Testing for normality of residual

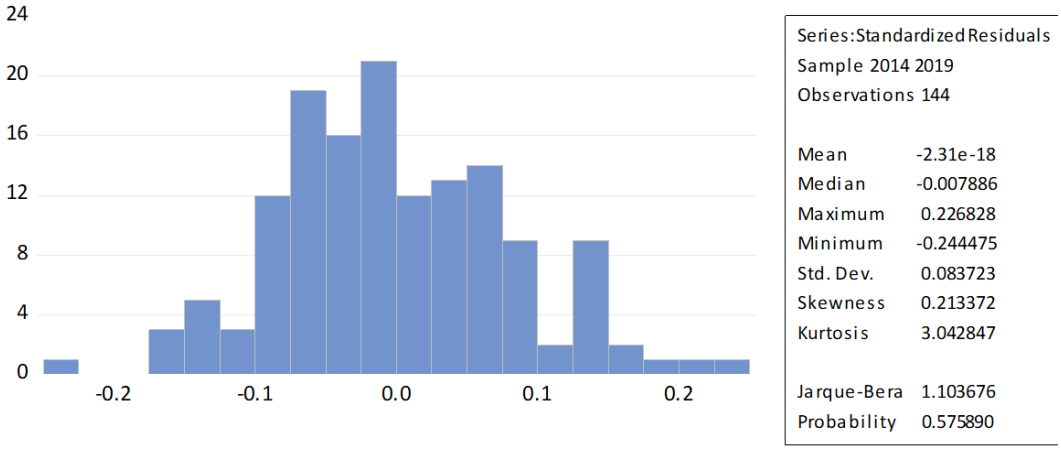

Figure 4.2: Histogram of residuals

As the Figure 4.2 shows the residuals have the mean value of -0.012 and at the same time, the median value of -0.079. The mean and median values are seem to be close. This may mean that the distribution of residual is symmetrically distributed. The standard deviation is 0.0837 is a low value and low standard deviation indicates that the data points tend to be very close to the mean. The skewness value 0.2134 is close to zero. This means that the distribution is not skewed.

The Jarque–Bera test was used to test the residuals normally. The null-hypothesis of this test is that the population is normally distributed.

Table 4.12: Results of Jarque–Bera test

Test of Jarque–Bera		
	Jarque–Bera test	
	Statistic	Sig.
Residuals	1.1037	0.5759

Results of the Jarque–Bera test are in the Table 4.12. The Jarque–Bera statistics is about 1.1037 and the probability of obtaining such a statistics under the normality assumption is about 0.5759. Therefore, the hypothesis is not rejectable, and that means that the residuals are normally distributed.

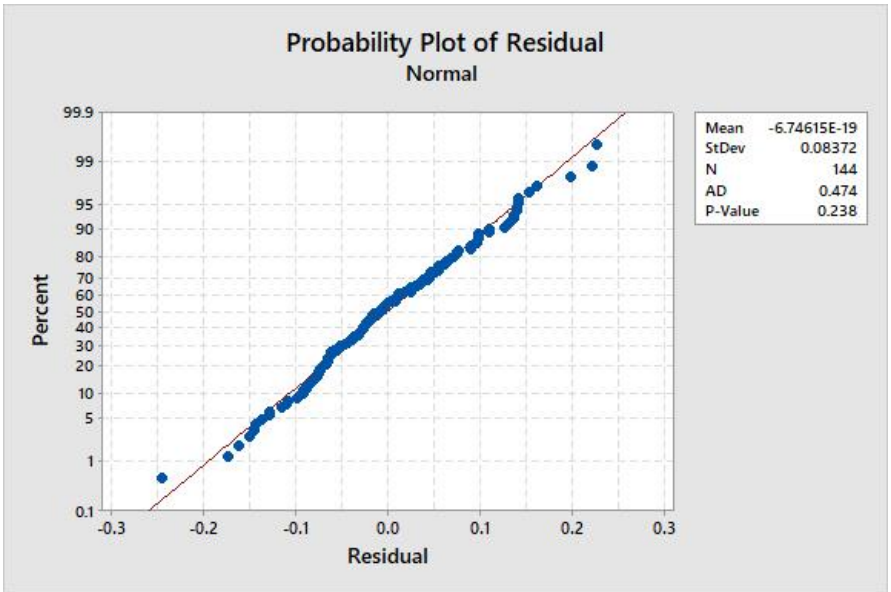

Figure 4.3: Probability plot of residuals

As the Figure 4.3 shows the probability plot of residuals indicates that the existing points always follow and approach the diagonal line. Furthermore, Anderson-Darling test a-squared value and p-value are 0.474 and 0.238 respectively. These values also conclude that the residuals follows the normal distribution.

Testing for the heteroscedasticity

The residuals against the fitted values plot helps to check the heteroscedasticity.

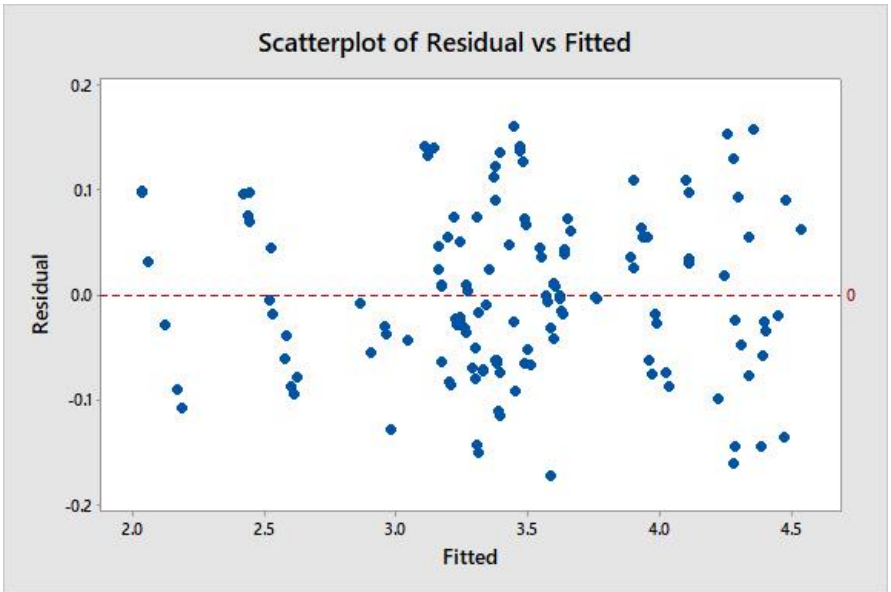

Figure 4.4: Residuals plotted against the fitted values

Figure 4.4 shows the plot of residuals against the fitted values. A linear relationship is reflected in a random scatter about a horizontal line at $e = 0$ and equal variances result in a horizontal band of points. So, plot indicates that the residuals and the fitted values are uncorrelated, as they should be in a homoscedastic linear model with normally distributed errors.

The proposed regression model satisfied all the regression assumptions. Therefore, the proposed model can be considered for these data.

4.5. Determinants of Market Price of Share

The selected model is:

$$YJ\_MPS = 2.2803 + 0.0373 * YJ\_ROA + 0.0031 * YJ\_ROE + 0.3096 * YJ\_BVS + 0.0281 * YJ\_EPS + 0.0922 * YJ\_DPS - 0.2929 * YJ\_DY \ldots\ldots\ldots\ldots \quad (4.2)$$

The regression analysis for selected model, revealed a R^2 of 0.98 which means that 98% of the variation in market price of diversified financial companies in Colombo stock exchange is explained by the variables included in the model. The P-value of F-test also shows the significance at 1% level and this leads to the rejection of null hypothesis which states that all explanatory variables are not significantly related to MPS. The mean absolute percentage error (MAPE) is 0.0589%. The value is very low and less than 1%. So, accuracy of the forecast system is high.

The model showed a positive impact on the share price, at the 5% significance level from the variables of Yeo and Johnson power transformed ROA, ROE, BVS, EPS, and DPS on Yeo and Johnson power transformed MPS while negative impact from Yeo and Johnson power transformed DY.

The coefficient of transformed ROA was 0.0373, which explains that increment in YJ_ROA by one unit increases YJ_MPS by 0.0373 and P-value of this variable, 0.0193 indicates that it is significant at 5% level. A unit increment in untransformed return on asset value increases share price by the amount given by the expression (4.1):

$$\frac{0.0373}{(ROA+1)^{0.69}(1.0181-0.0181(ROA+1)^{0.31})^{7.6667}} \quad \text{……...…} \quad (4.1)$$

The average value of ROA is 3.8 for the analyzed data in this study and the respective increase share price by 0.0138 for one unit increment in ROA.

Transformed ROE has the coefficient of 0.0031, which means that increase in YJ_ROE per unit increases YJ_MPS by 0.0031 and it had P-value of 0.0023. It explains that this variable is significant at 1% level. Expression (4.2) below represents the increment in share price for a one unit increment in the value of untransformed ROE.

$$\frac{0.0031}{(ROE+1)^{-0.34}(1.00035-0.00035(ROE+1)^{1.34})^{7.6667}} \quad \text{……...…} \quad (4.2)$$

At the average ROE of 11.70, one unit increment in return on equity increases share price by 0.0079.

The variable of transformed BVS has the coefficient of 0.3096 with P-value of 0.000. This value indicates that book value per share is significant at 1% level and one unit increase in YJ_BVS increases YJ_MPS by 0.3096. The increment in share price for one unit increment in untransformed book value per share is given following expression (4.3):

$$\frac{0.3096}{(BVS+1)^{1.1}(0.5356+0.4644(BVS+1)^{-0.1})^{7.6667}} \quad \text{……...…} \quad (4.3)$$

At the average value of 252.88 of BVS, one unit increment in BVS increases share price by 0.0038.

The coefficient of transformed EPS is 0.0281and its P-value is 0.000. This coefficient explains that increment in one unit of YJ_EPS increases YJ_MPS by 0.0281 and it is significant at 1% level. A unit increment in untransformed earnings per share value increases share price by an amount that given by expression (4.4):

$$\frac{0.0281}{(EPS+1)^{0.5}(1.00843-0.00843(EPS+1)^{0.5})^{7.6667}} \quad \text{……...…} \quad (4.4)$$

During the period considered, the average value of EPS was 16.5, increases of share price is 0.0083 for one unit increment in earnings per share at this point of EPS.

Transformed DPS has the coefficient of 0.0922, which indicates a unit increment in YJ_DPS increases YJ_MPS by 0.0922. The respective P-value of 0.0444 implies that YJ_DPS is significant at 5% level. For one unit increment in the value of untransformed DPS, increment in the share price is given by the expression (4.5) below:

$$\frac{0.0922}{(DPS+1)^{1.3}(0.9539+0.0461(DPS+1)^{-0.3})^{7.6667}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5)$$

This implies that one unit increment in dividend per share increases share price by 0.0216 when DPS value is 11.70.

The variable Yeo and Johnson power transformed dividend yield showed a negative relationship with transformed market price of share and the results were significant at 1% level. The coefficient for YJ_DY was -0.2929 and it means that increment in dividend yield by one unit decrease share price by 0.1710. The changes in share price for a unit change of untransformed DY value represent by the expression (4.6):

$$\frac{0.171}{(DY+1)^{1.19}(0.865-0.135(DY+1)^{-0.19})^{7.6667}} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.6)$$

At the average value of DY, 2.90, share price decreases by 0.0430 for one unit increment in DY.

4.6 Discussion

The variables of ROA, ROE, BVS, EPS, DPS and DY have been selected as determinants of share price.

The first independent variable, namely the ROA has a positive and significant impact on market price of share. The result suggests that share price increase for diversified financial companies in terms of higher ROA. Similar results for the return on asset in share price can be found in the other studies for examples: Kabajeh et al. (2012), Idawati and Wahyudi (2015) and Rosikah et al. (2018).

Referring to the coefficient value of the variable ROE has a positive and statistically significant effect on market price of share. The positive effect of ROE on the share price in line with Dissanayake and Biyiri (2017), Khan et al. (2011) and Sharif, Purohit and Pillai (2015) research findings. This result suggests that diversified financial company with more return on equity have higher share price.

The results indicate that BVS has a positive relationship with market price of share and statistically highly significant too. Also, BVS has lowest impact on share price. Generally, the BVS is of use to determining whether a share is undervalued. The result suggests that share price increased in terms of higher book value per share. This finding is supported by other studies, for example: Glezakos et al. (2012), Abiodun (2012) and Ali Ahmadi (2019).

The variable of EPS has a positive and statistically highly significant impact on the MPS. Seetharaman and Raj (2011), Shabani (2013), Kalama (2013), Hunjra (2014), Robbetze et al. (2017), and Ahmed (2018) have obtained similar results that; high value of share price is consistent with high value of EPS. The result suggests that share price increase for diversified financial companies in terms of higher earnings per share. This result indicates that the EPS is important in determining the share price.

The estimated result shows that DPS has a positive and statistically highly significant impact on MPS which is consistent with the result of Dhungel (2013), Kalama (2013), Sharif (2015) and Ahmed (2018). The result revels that companies give higher DPS,

they become more attractive to investors and then the stock price naturally increases to take advantage of this benefit from stock ownership.

DY has a negative and higher significant impact on the MPS. This result suggests that diversified financial company with more DY have lower share price. Similar results for the negative impact in share price can be found in the other studies for examples: Mohammad et al. (2012) have found that there is a strong negative association between share price volatility and two key dividend policy measures, dividend yield and dividend payout. Shah and Noreen (2016) also found the same results.

CHAPTER 5

CONCLUSIONS

The aim of this study was to identify share price determinants for diversified financial companies listed in the Colombo Stock Exchange for the period from 2014 to 2019. In this regard, the market price of share was used as the response variable and return on asset, return on equity, book value per share, earnings per share, dividend per share and dividend yield were used as the determinants. The study examined how these determinants affect the share prices of companies listed under the diversified financial sector on the Colombo stock exchange.

Several models including pooled model, random effects model and fixed effects model were tested for the data because data were in panel form. The most appropriate model was selected based on Chow test, Breusch-Pagan Lagrange multiplier test, and Hausman test. Finally, fixed effect model could be selected as the best model. That was a multiple linear regression model. Since, data did not follow normal distribution, data were transformed by using Yeo and Johnson power transformation and then used for the model fitting. The linearity test, multicollinearity test, normality of residual test, white heteroskedasticity test and Durbin Watson test for autocorrelation were employed. The results of these tests confirmed the validity of the assumptions of multiple regression analysis.

Results of this study confirm that ROA, ROE, BVS, EPS, DPS and DY have statistically significant impacts on share prices of the diversified financial companies listed in the Colombo stock exchange. R^2 value of 98% and MAPE value of 0.0589% show the higher accuracy in forecast and predictability of the model.

The average value of ROA is 3.8 for the analyzed data in this study and the respective increases of share price by 0.0138 for one unit increment in ROA. It has positively associated with share prices.

At the average ROE of 11.70, one unit increment in return on equity increases share price by 0.0079. ROE has a significant positive impact on share prices.

At the average value of 252.88 of BVS, one unit increment in BVS increases share price by 0.0038 and BVS has lowest positive impact on share prices.

During the period considered, the average value of EPS was 16.5, increases of share price is 0.0083 for one unit increment in earnings per share at this point of EPS. It has a positive association with share prices.

One unit increment in dividend per share increases share price by 0.0216, when DPS value is 11.70. DPS has higher positive impact on share prices.

At the average value of DY, 2.90, share price decreases by 0.0430 for one unit increment in DY. This determinant only has the negative impact on share prices.

This study revealed new testimony from the perspective of Sri Lanka, which are deemed valuable and important to the market participants. Thus, results from this study tend to be especially useful to investors, financial administrators and market advisors, because they can look out for these key factors when forecasting share prices.

This study gives suggestions to Sri Lanka's diversified financial companies to take appropriate action to boost the plans aligned with the important factors dealt with in this study because the key variables in this study significantly influence the share prices.

This study aimed to identify the determinants of share price of diversified financial companies listed in Colombo stock exchange and the study covered the period from 2014 to 2019. Because, this study was undertaken in the diversified financial companies, findings of this study are not applicable to other sector companies. Moreover, only the accountable internal factors were considered as the determinants of share prices.

This study was with some limitations. One of the limitation, the study was used only diversified financial companies for this study. The next limitation, the study investigated certain number of internal variables to determine the share price and thirdly, it analyzed the data in the short time frame from 2014 to 2019. In the future, it can be aimed to complement a study in various sectors with diverse variables and large time frame, as external factors of the company also influence its share prices. This would provide better insights on the determinants of share prices.

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APPENDIX A: Boxplots for Yeo–Johnson power transformed independent variables

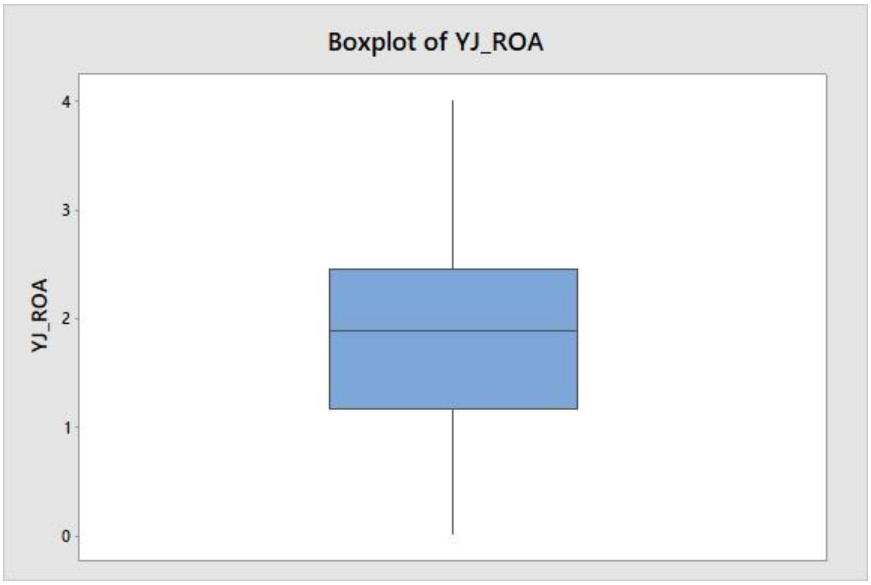

Figure A.1: Boxplot of YJ_ROA

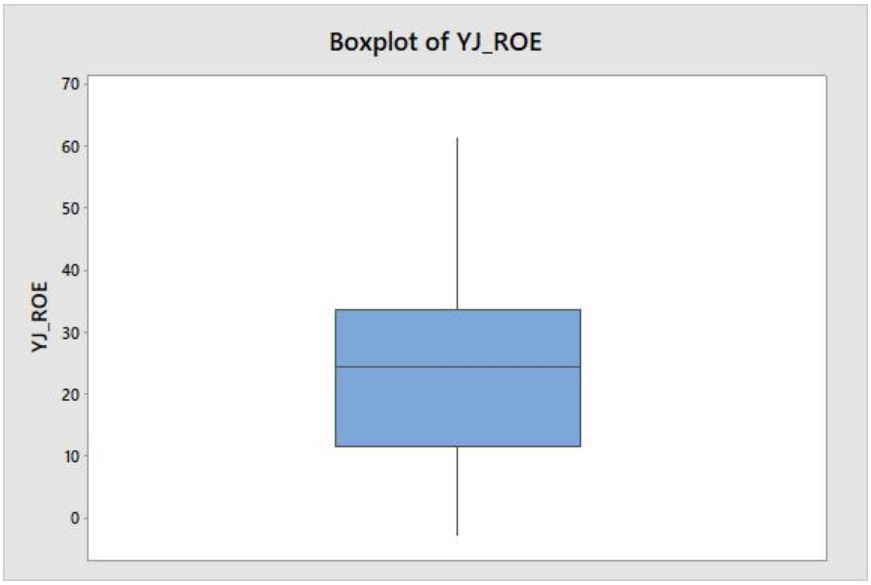

Figure A.2: Boxplot of YJ_ROE

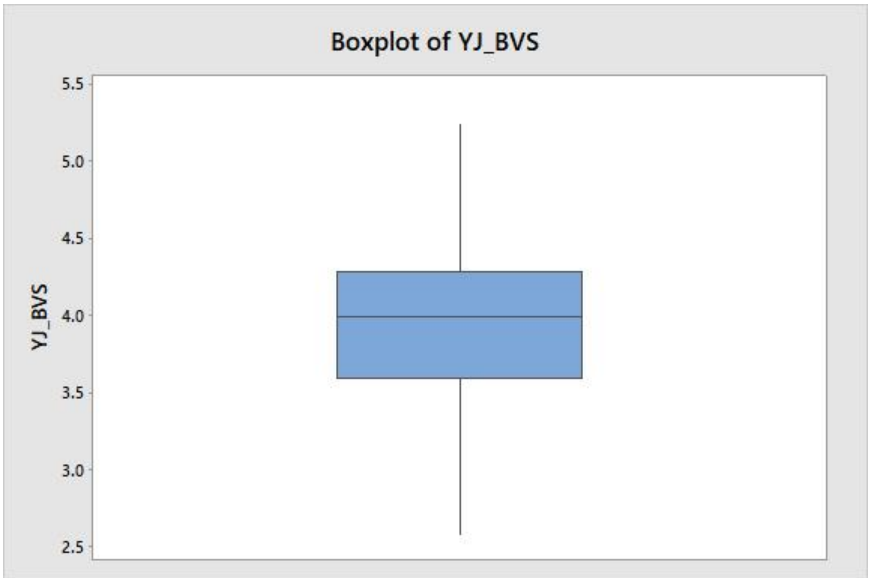

Figure A.3: Boxplot of YJ_BVS

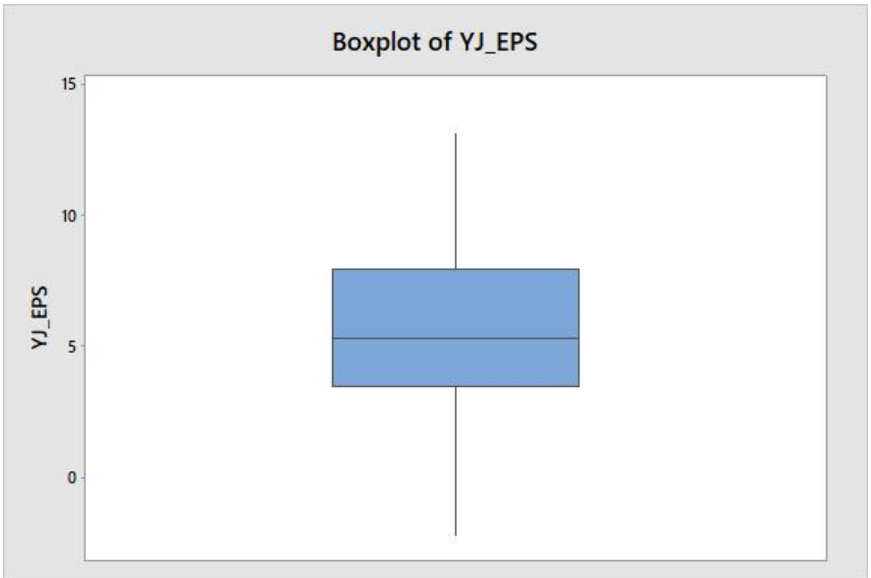

Figure A.4: Boxplot of YJ_EPS

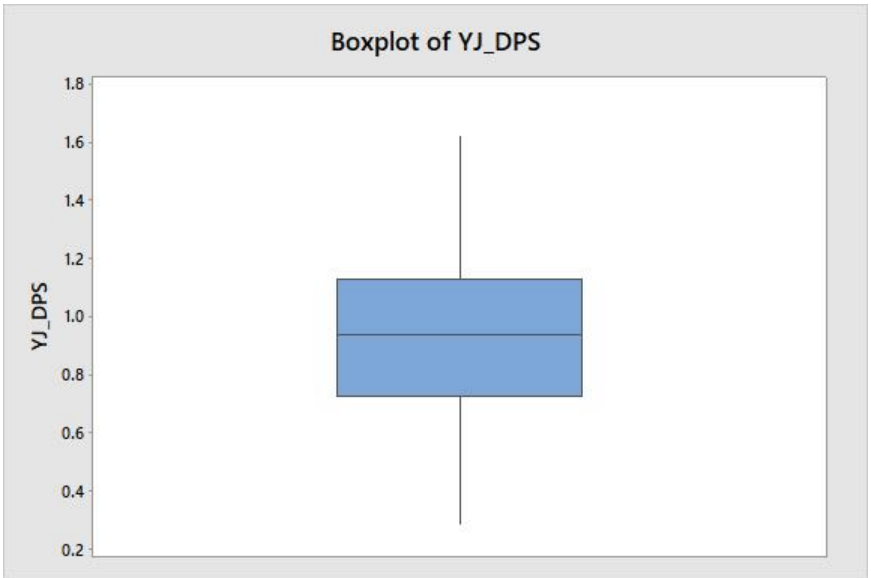

Figure A.5: Boxplot of YJ_DPS

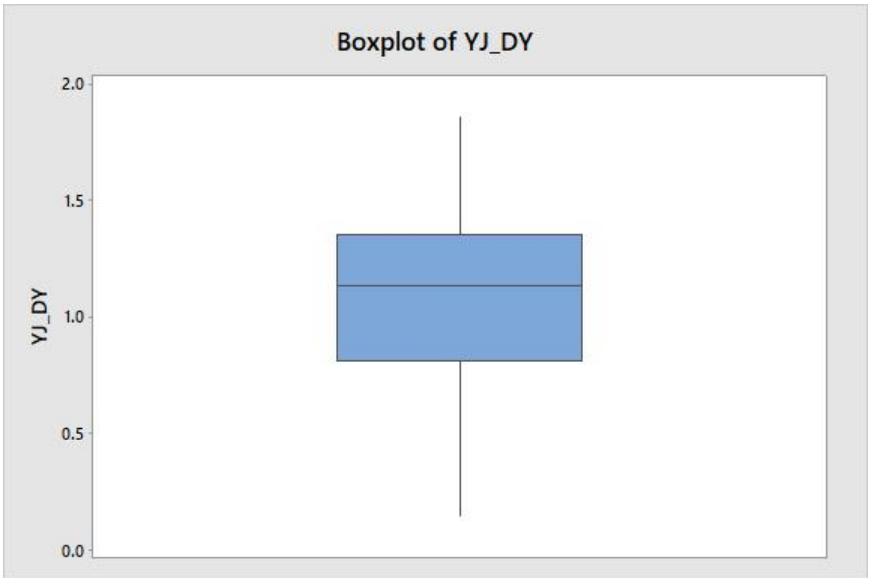

Figure A.6: Boxplot of YJ_DY

APPENDIX B: Probability plots for Yeo–Johnson power transformed independent variables

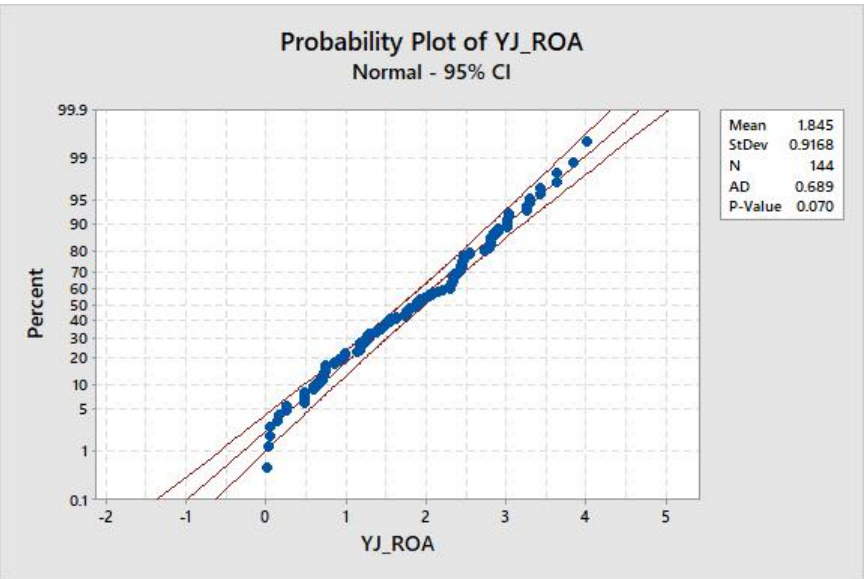

Figure B.1: Probability plot of YJ_ROA

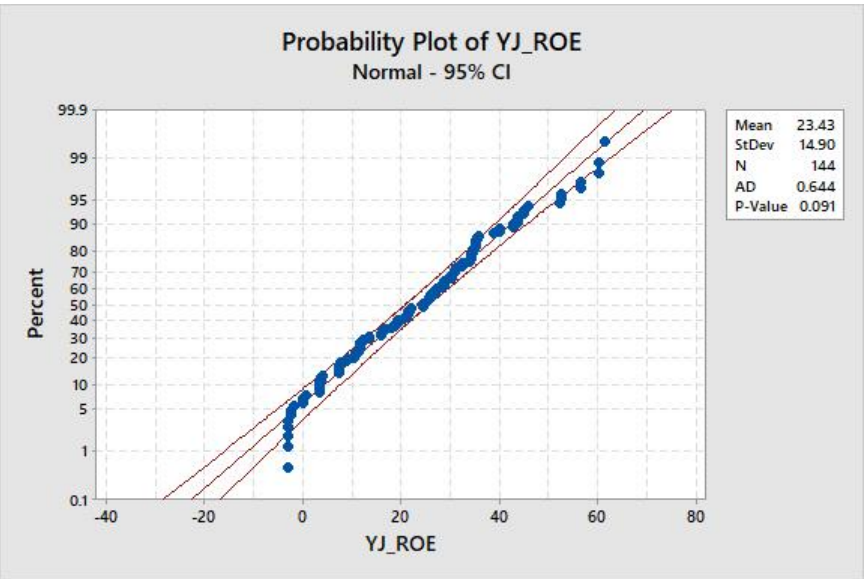

Figure B.2: Probability plot of YJ_ROE

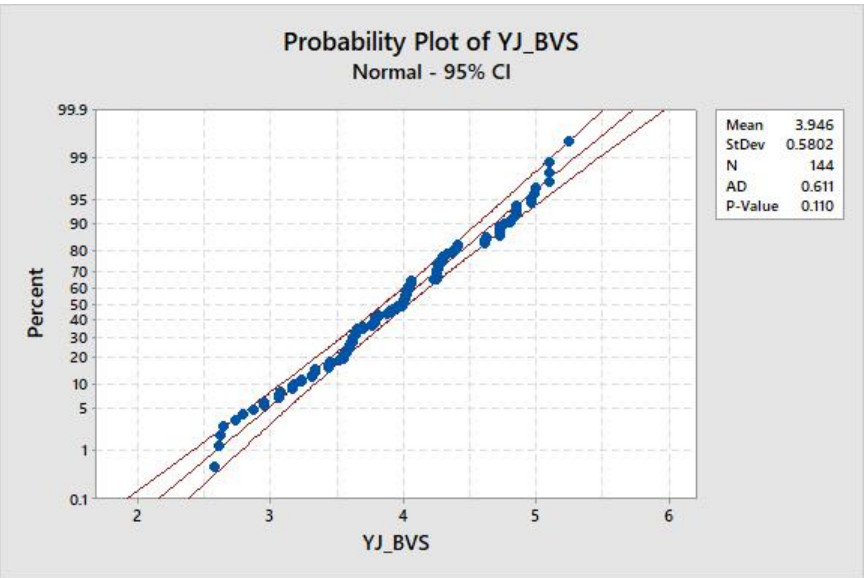

Figure B.3: Probability plot of YJ_BVS

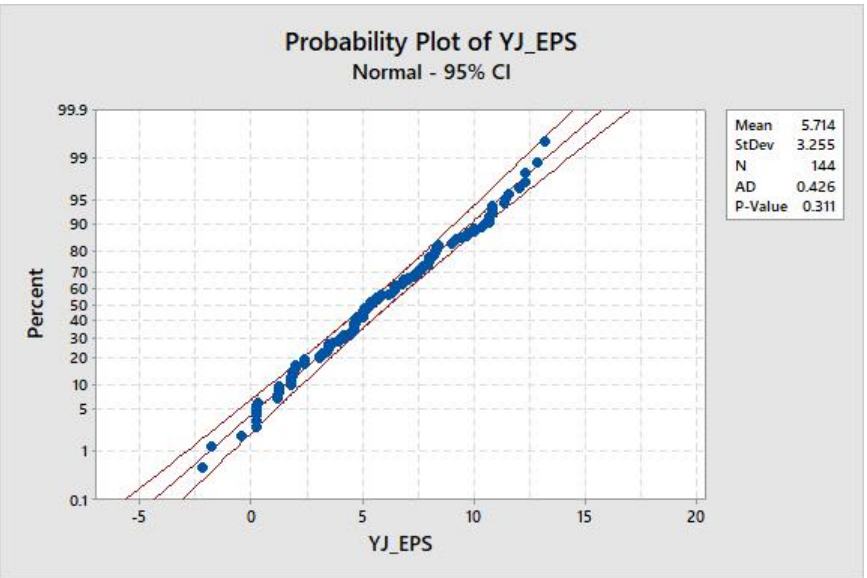

Figure B.4: Probability plot of YJ_EPS

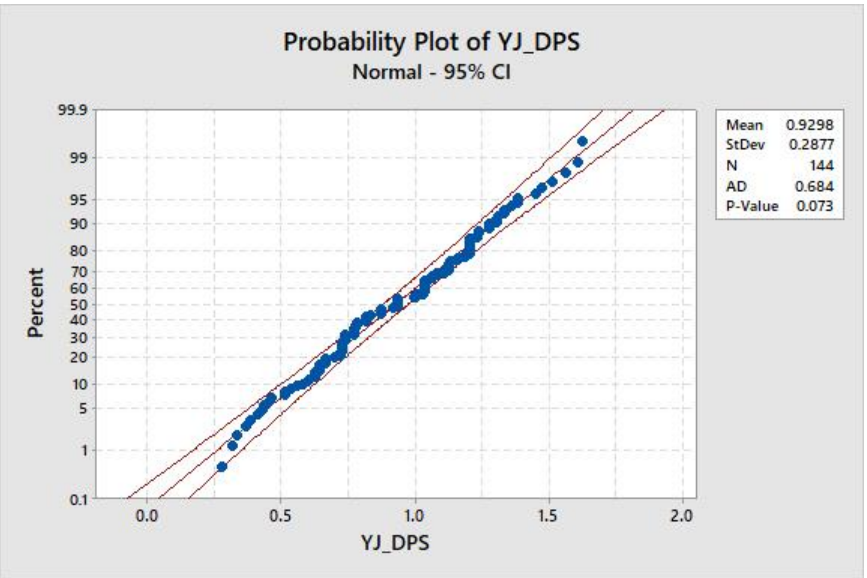

Figure B.5: Probability plot of YJ_DPS

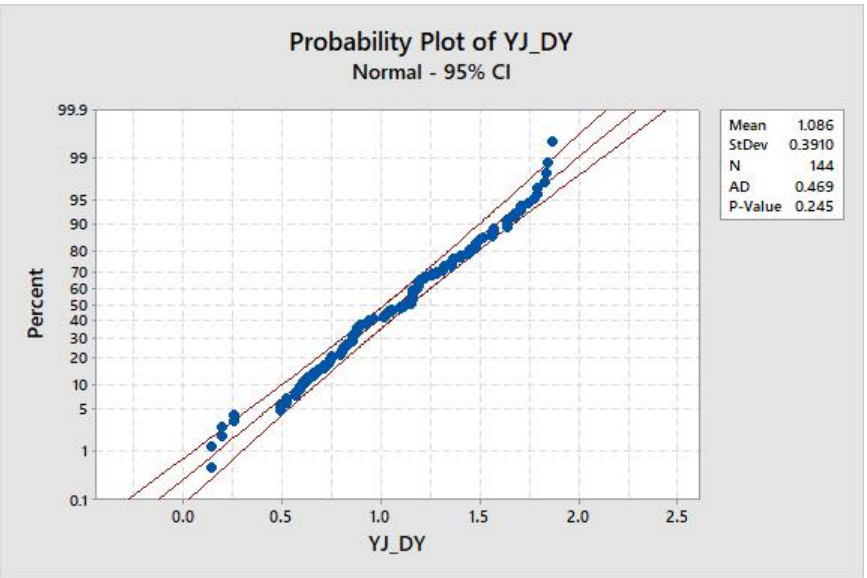

Figure B.6: Probability plot of YJ_DY

APPENDIX C: Scatter plots for dependent variable against independent variables

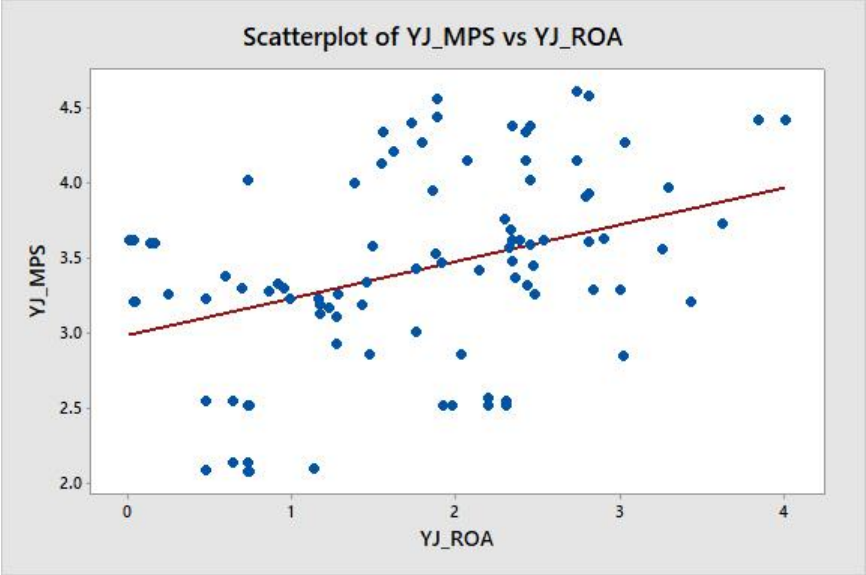

Figure C.1: Scatter plot of YJ_MPS against YJ_ROA

Figure C.1 shows positive linear relationship between YJ_MPS and YJ_ROA.

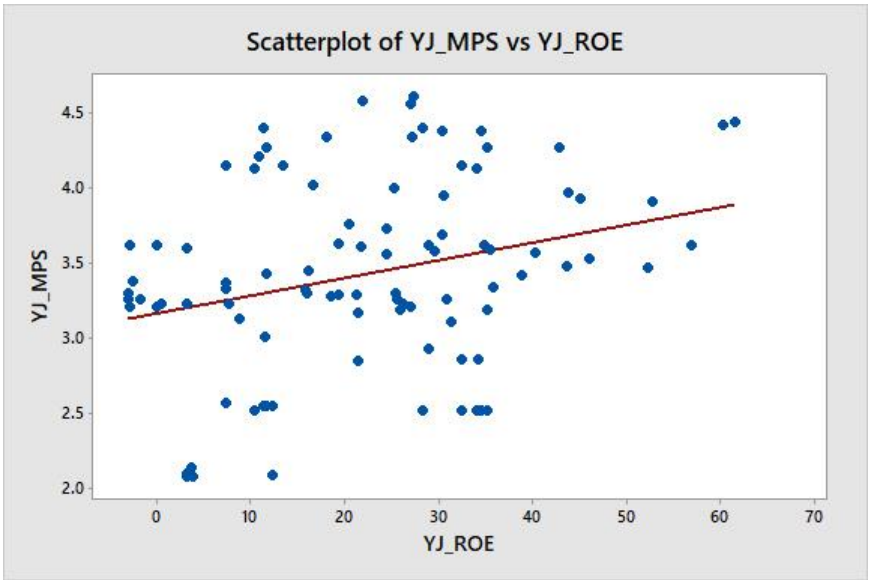

Figure C.2: Scatter plot of YJ_MPS against YJ_ROE

Figure C.2 shows positive linear relationship between YJ_MPS and YJ_ROE.

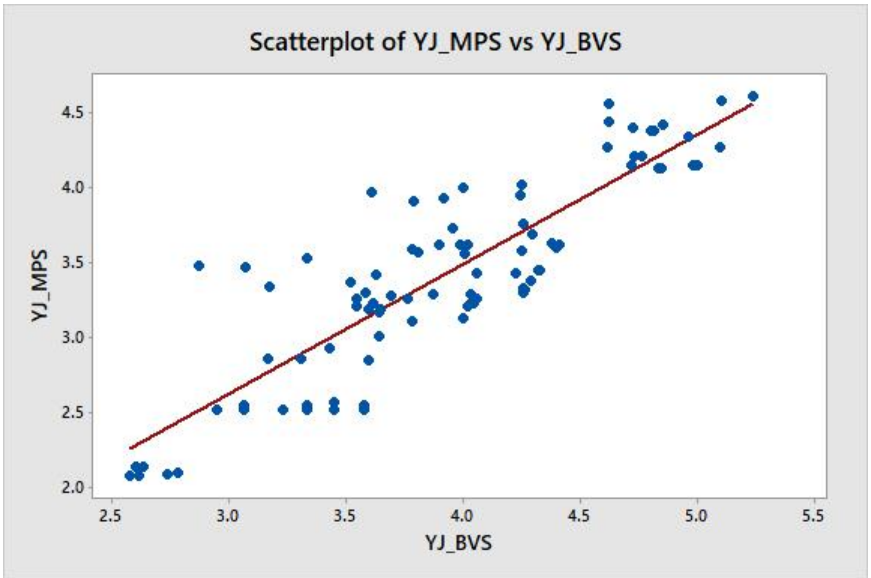

Figure C.3: Scatter plot of YJ_MPS against YJ_BVS

Figure C.3 shows positive linear relationship between YJ_MPS and YJ_BVS.

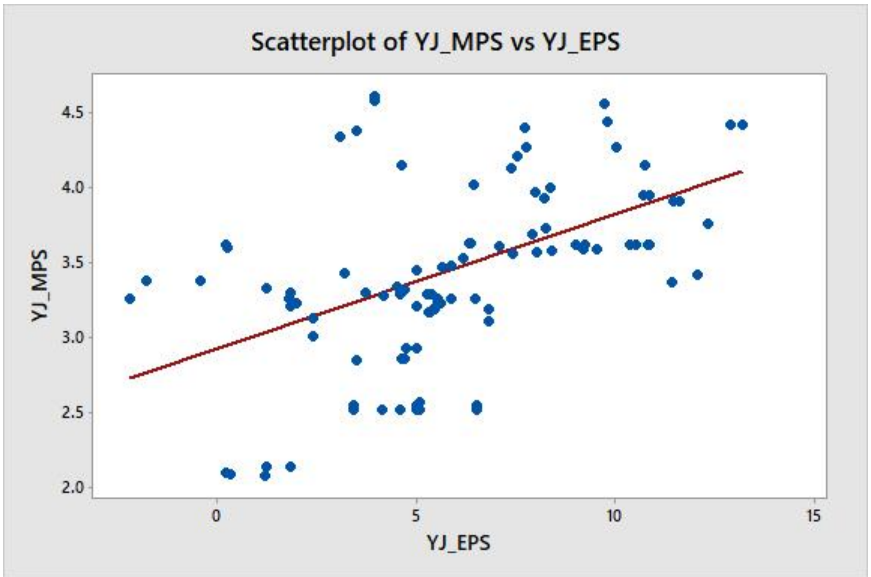

Figure C.4: Scatter plot of YJ_MPS against YJ_EPS

Figure C.4 shows positive linear relationship between YJ_MPS and YJ_EPS.

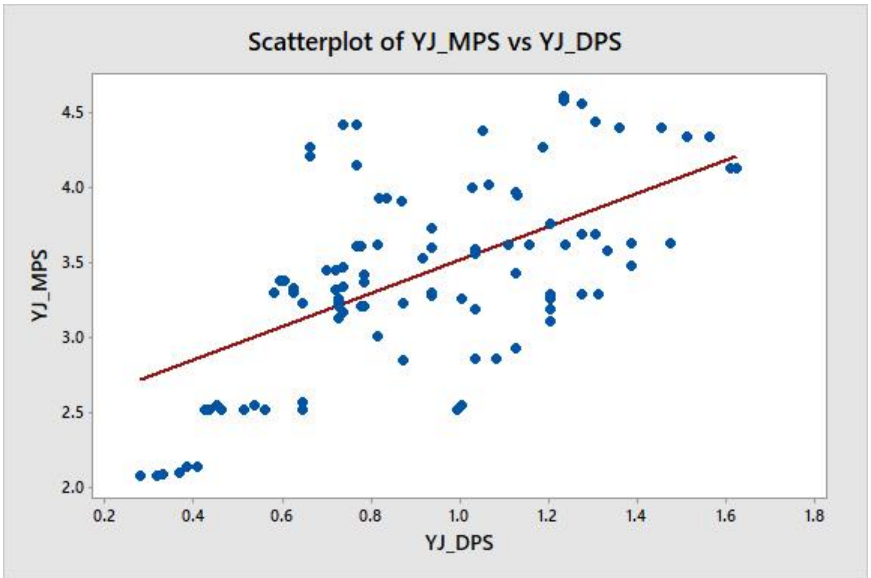

Figure C.5: Scatter plot of YJ_MPS against YJ _DPS

Figure C.5 shows positive linear relationship between YJ_MPS and YJ_DPS.

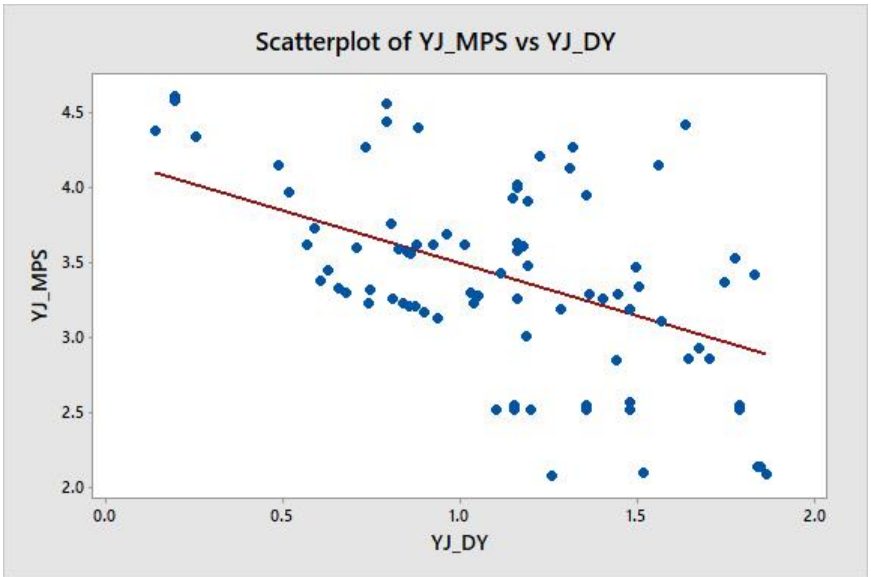

Figure C.6: Scatter plot of YJ_MPS against YJ _DY

Figure C.6 shows negative linear relationship between YJ_MPS and YJ_DY.