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## **Examining the Relationship Between Performance Measures and Share Price: An Empirical Study on Mobile Telecommunications Companies Listed on Bursa Malaysia**

Gilbert O'Neil Mushure\*

*Department of Accountancy, University of Zimbabwe, P.O Box MP167 Mount Pleasant Harare Zimbabwe*

*Email: [accountancy@commerce.uz.ac.zw](mailto:accountancy@commerce.uz.ac.zw)*

### **Abstract**

This paper is in Market Based Accounting Research (MBAR) which is a sub-discipline of Accounting & Finance under the broad field of Business Management. This research paper is a quantitative study of the relationship between financial and non-financial performance measures, and future share price performance of mobile telecommunications companies listed on Malaysia's stock exchange known as Bursa Malaysia. Knowledge of the nature and strength of these relationships is used for forecasting future share price performance for investment decision making purposes. Four variables' relationships to future share price performance were studied; these variables were Earnings Per Share (EPS), Price Earnings (P/E), Return on Equity (ROE), and Subscriber Growth (SG). The study found evidence that from one quarter to the next, EPS and P/E had the strongest relationship with the subsequent quarter's share price, whilst ROE and SG were poor predictors of share price performance. Furthermore the study found that these relationships, whilst true for one company, did not necessarily exist for all companies even though the companies were all in the mobile telecommunications industry and their shares were traded on the same Bursa Malaysia market.

**Keywords:** Quarterly Data, Financial Performance Measures, Non-Financial Performance Measures, Future Share Price Performance, Mobile Telecommunications Companies, Bursa Malaysia.

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\* Corresponding author.  
E-mail address: [gilbertmushure@gmail.com](mailto:gilbertmushure@gmail.com)

## **1. Introduction**

A problem exists of using common financial statement ratios, such as earnings per share and return on equity, as performance measures for investment decision making purposes without research on the specific relationship between these performance measures and future share price performance for a particular company's shares on a particular share market. The problem is that the relationship between each of these financial statement ratios and future share price performance is not general but specific; it varies by company, Industry Classification Benchmark (ICB) industry sector, and from share market to share market - as established from the results of different studies mentioned further on.

It is the norm in the investment management industry today that financial analysts and investment managers tend to focus on financial statement ratios as measures of a company's performance, as a rule of the thumb, for investment decision making without evidence of the strength of these performance measures' relationship to subsequent yields of investments as depicted by future share price performance. The critical problem is therefore a generalization of the relationship of common financial statement ratios and future share price performance without research on the specific behavior of future share price to each performance measure for a particular company or industry sector on a particular share market, i.e. for example the assumption if a company's earnings per share are high, the company is doing well and the share price performance will do well in the short term.

There is a gap in the current literature as no research has been carried out on the relationship between specific performance measures and future share price performance for mobile telecommunications companies listed on Bursa Malaysia. Such research has been done in other countries' share markets for specific companies or industry sectors, for example by the author in [1] who studied the relationship between financial performance measures and share price for Johannesburg Stock Exchange (JSE) listed gold mining companies in South Africa, or by the author in [2] who studied the relationship between non-financial performance measures and share price for telecommunications companies in Europe. Much more notable authors in Market Based Accounting Research have also studied the relationship between common financial statement ratios as financial performance measures and share price with results possibly varying depending on the share market they did their research in, or the industry sector in which companies in their sample belonged to – namely the authors in [3, 4, and 5]. This research paper pioneers the identification of the relationship between common financial statement ratios as financial performance measures, as well as an industry specific non-financial performance measure of subscriber growth (SG), and future share price performance for mobile telecommunications companies listed on Bursa Malaysia.

The method used in this research paper involves the collection of secondary data and the subsequent analysis of relationships between the independent variables data and the dependent variables data. The data collected from Bursa Malaysia comprises of independent variables data (EPS, ROE, P/E, and SG) collected from quarterly financial reports of mobile telecommunications companies, and dependent variables data of share prices (SP) from the time of a company's listing on Bursa Malaysia to the financial year ended 2012.

The purpose of this research is to establish the nature of the relationship between performance measures identified in this paper and future share price performance for mobile telecommunications companies listed on Bursa Malaysia to enable investment managers to make better decisions regarding short term share price performance of these companies.

### ***1.1. Statement of the problem***

Malaysia's economy is projected to be one of the top 25 largest economies in the world by 2050 according to HSBC Global Research – The World in 2050 [25]. Malaysia is therefore an attractive investment destination for investment managers from more developed capital markets as it offers greater opportunities for growth of investments. However these investment managers have less knowledge of Bursa Malaysia than they have of major global markets such as the New York Stock Exchange, NASDAQ, Tokyo Stock Exchange, London Stock Exchange and Euronext.

One of the most attractive industries to invest in on Bursa Malaysia is the mobile telecommunications sector. The mobile telecommunications industry was one of the fastest growing industries in Malaysia over the 10 year period ending 2012. According to the Malaysian Communications and Multimedia Commission statistics mobile users grew from 12% at the end of 2001 to 138% at the end of 2012 [26]. The Malaysian mobile telecommunications industry companies were also projected to profit from the global trend of increased data usage by mobile users. These fact syndicate that there is an opportunity for high growth in share value for investment managers investing in mobile telecommunications industry sector companies on Bursa Malaysia.

A discussion follows on the shortcomings of various performance measures which investment managers may use for investment decision making in regard to the above.

Traditional performance measures used for investment decision making are common financial statement ratios, namely EPS, P/E and ROE. Investment managers cannot accurately depend on these traditional performance measures without research on the nature of relationship between these performance measures and subsequent investment yields as depicted by future share price performance, for a particular company or industry sector on a particular share market. The author in [5] presented empirical evidence of the relevance of common financial ratios to forecasting share price, both unconditional and conditional on inflation rate. However the authors in [3, 4] showed that a linear relationship might not exist between common financial statement ratios and share price. The results of these studies indicate that it is clearly presumptuous to depend on traditional performance measures for investment decision making without due research on the nature of their relationship with future share price performance for a particular company, or a particular industry sector on a particular share market – hence the need for research.

Non-financial performance measures are not fully appreciated by investors in investment decision making. Previous researchers have suggested that non-financial performance measures have a stronger relationship with share price and thus would be a better tool for investment decision making namely authors in [6, 7 and 8]. With regard to the mobile telecommunications industry companies listed on Bursa Malaysia it is crucial to identify

non-financial performance measures which can be accurately used in investment decision making in forecasting future share price performance. One widely published non-financial performance measure for mobile telecommunications industry sector companies is subscriber growth (SG).

This paper engaged in thorough analysis of the relationship between each performance measure (EPS, P/E, ROE and SG) and future share price (SP) for mobile telecommunications companies listed on Bursa Malaysia.

### 1.2. Conceptual Framework

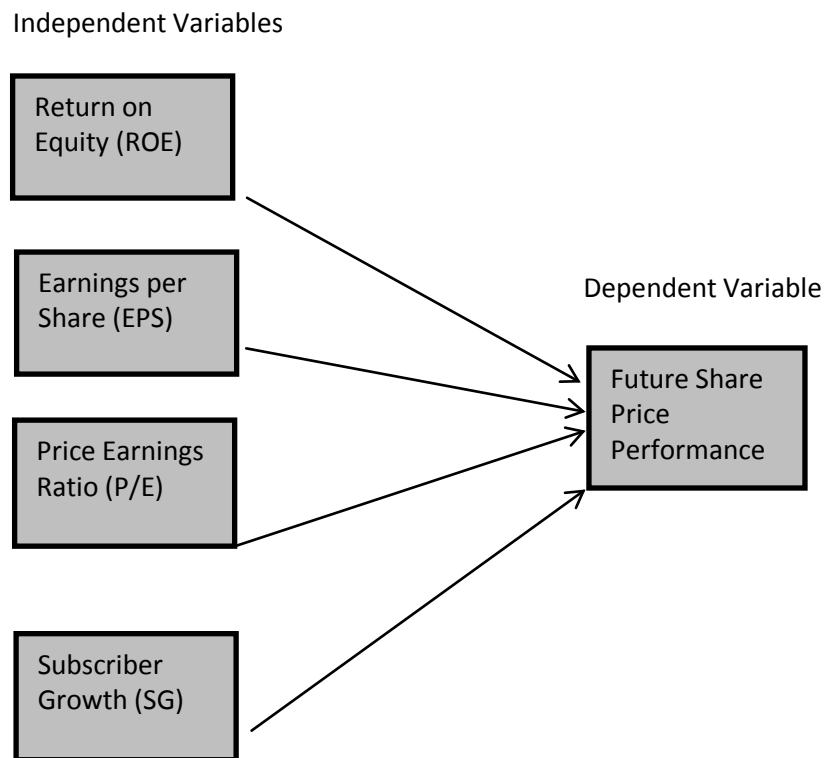


Fig. 1. Conceptual Framework

### 1.3. Literature Review

#### 1.3.1 Return on Equity (ROE)

Shareholders are concerned about their return on investment. The authors in [9] found that the best accounting ratio to measure this is ROE. The return on equity (ROE) measures the rate of return on the ownership interest of the ordinary share owners. It is viewed as one of the most important financial ratios. It measures a firm's efficiency at generating profits from every unit of net assets and shows how well a company uses investment money to generate earnings growth. Consequently a higher ROE should result in a higher share price (SP) as a depiction of shareholders' satisfaction with regard to this particular performance measure.

In the study conducted by the author in [10], it was found that ROE is the only common financial statement based ratio to be the most linked to share price. This study resonates well with findings of the authors in [11, 12] which found that ROE was the most correlated parameter to the share price among common financial statement ratios, with correlation of 0.25 and 0.29 respectively, as shown in Table 1. The author in [13] however only found a correlation of 0.10.

Table 1: Correlation of different performance measures with shareholder wealth

Correlation with SP			
	From reference [11]	From reference [13]	From reference [12]
ROE	0.25	0.10	0.29
EPS	0.18	0.06	0.34

In this study, ROE of Bursa Malaysia listed mobile telecommunications companies and its correlation to share price is examined.

### 1.3.2 Earnings per Share (EPS)

The term earnings per share (EPS) represents the portion of a company's earnings, net of taxes and preferred share dividends, which is allocated to each ordinary share holder. EPS is widely considered to be the most popular method of quantifying a firm's profitability and is the industry standard in determining corporate profitability for shareholders.

EPS is a carefully scrutinized metric that is often used as a barometer to gauge a company's profitability per unit of shareholder ownership. As such, EPS is a key driver of share prices. It is also used as the denominator in the frequently cited P/E ratio monitored by equity investment managers.

The author in [14] indicates that five year changes in earnings explained only 24 per cent of the changes in market value. This corroborates the findings of the work by the author in [10]; whilst authors in [11, 12] found correlations between EPS and share price of 0.18 and 0.34 respectively the author in [13] only found a correlation of 0.06 as shown in Table 1.

In this study, EPS of Bursa Malaysia listed mobile telecommunications companies and its correlation to share price is examined.

### 1.3.3 Price Earnings Ratio (P/E)

Price earnings ratio is a ratio of a company's current share price compared to its per-share earnings. Unlike ROE and EPS which are profitability ratios, P/E is a valuation ratio. P/E is the most widely used ratio to determine whether current share price is too high or too low.

The P/E is sometimes referred to as the “multiple”, because it shows how much investors are willing to pay per dollar of earnings. The higher the P/E the more investors are willing to pay for each dollar earned by the firm; and the lower the P/E the less investors are willing to pay for each dollar earned by the firm. If a company were currently trading at a multiple (P/E) of 20, the interpretation is that an investor is willing to pay \$20 for \$1 of current earnings. It also means, assuming the firm distributes all of its earnings as dividends; it would take 20 years for an investor to recover their initial investment. If we view P/E as a measure of payback, all else being equal, lower P/E is better [15].

P/E ratio is used to value ordinary shares in the following way. Investors examine whether an ordinary share's P/E is considered to be higher or lower than ‘normal’ to determine whether the price is too high or too low. The rationale is that if a firm's P/E ratio is too low relative to that of similar firms, its earnings have not been fully captured in the existing share price and hence will be bid up. Therefore, as with other financial ratios, comparison to firms in the same industry is essential for P/E to make sense. If the appropriate value of the P/E is determined, which is a matter of judgment, then this value can be multiplied by EPS to determine the appropriate share price of the firms ordinary shares.

The author in [16] calculated the correlation between P/E and subsequent growth in stock prices and found that P/E was negatively and significantly correlated with subsequent stock price growth. This corroborates with results of studies by the author in [17]. However the author in [18] found that firms with high P/E do not necessarily suffer decline in stock price growth when they are in an industry experiencing huge growth or are in a position to acquire other firms to maintain investor confidence hence a high P/E. This is particularly so in a stock market boom, and was the case technology companies in the United States in the late 90's during the dot com boom, as well as with Apple Co. in 2011 & 2012 as many investors were willing to overlook traditional metrics such as P/E ratio in favor of confidence in technological advancements. The possibility of this effect is possible for mobile telecommunications industry companies as they have experienced massive growth over the past 10 years.

In this study, P/E of Bursa Malaysia listed mobile telecommunications companies and its correlation to share price is examined.

#### ***1.3.4 Subscriber Growth (SG)***

A mobile subscriber is a consumer who enters into an agreement with a carrier i.e the mobile telecommunications company. Once executed, the agreement requires the carrier to provide wireless telecommunications to the subscriber. Subscriber numbers are one indication of market share for mobile telecommunications companies. An increase in subscribers from one financial period to another indicates an increase in the number of customers from which revenue may be derived and therefore is a critical measure of performance for mobile telecommunications companies. Mobile telecommunications companies publish subscriber numbers in their periodic financial reports.

The author in [2] found that customer retention rates were positively associated with the value of shares. The

author in [2] also found that customer satisfaction had a lagged effect on the performance which was only reflected after two quarters, but however, held explanatory power for up to five quarters. The author in [19] reported that customer satisfaction might work as a leading indicator for financial performance and they found that satisfaction had a lagged effect on performance. The author in [20] concluded that satisfaction measures are significantly and positively linked to future financial performance measured in business unit revenues and operating profits. Moreover the author in [20] suggested that the effect of satisfaction was more related to long-term performance and less visible in short-term performance. Regarding customer retention, the author in [21] showed that relatively small positive shifts in retention rates have a considerable effect on profits and the author in [22] lent additional support for the positive relationship between retention and financial performance.

Changes in subscriber numbers, i.e Subscriber Growth (SG), are customer retention rates for mobile telecommunications companies. On the other hand the extent to which mobile telecommunications companies lend importance to customer satisfaction as a measure is unknown as they do not publish customer satisfaction performance in their periodic financial reports.

In this study the relationship between quarterly changes in subscriber numbers (customer retention) of Bursa Malaysia listed mobile telecommunications companies and share price is examined.

#### ***1.4 Research Hypothesis***

The research hypotheses are the following

Hypothesis 1 – Earnings per Share (EPS) is positively and significantly related to Share Price (SP) of mobile telecommunications companies on Bursa Malaysia

Hypothesis 2 – Price Earnings Ratio (P/E) is negatively and significantly related to Share Price (SP) of mobile telecommunications companies on Bursa Malaysia

Hypothesis 3 – Return on Equity (ROE) is positively and significantly related to Share Price (SP) of mobile telecommunications companies on Bursa Malaysia

Hypothesis 4 – Subscriber Growth (SG) is positively and significantly related to Share Price (SP) of mobile telecommunications companies on Bursa Malaysia.

## **2. Materials and Methods**

In his study on the correlation between various financial and economic ratios and the share price, the author in [11] found that ROE and EPS were the most correlated variables to the share price, whilst the author in [16] found that P/E was negatively and significantly correlated with subsequent stock price growth. The author in [21] showed that relatively small positive shifts in retention rates have a considerable effect on profits, and should therefore have a positive and significant relationship with share price. This paper attempted to test the validity of these findings for mobile telecommunications companies listed on Bursa Malaysia. As a result, this

paper used ROE, EPS and P/E as independent variables and attempted to correlate them to the share price (SP) of Bursa Malaysia listed mobile telecommunications companies as a dependent variable. In addition this paper attempted to correlate the relationship between subscriber growth (SG), a non-financial performance measure, to the share price (SP) of Bursa Malaysia listed mobile telecommunications companies.

The population of relevance comprised all the companies in the mobile telecommunications industry in Malaysia. The mobile telecommunications industry in Malaysia consists of five companies namely Digi, Maxis, Axiata, U-Mobile and Time. Axiata, Digi, and Maxis are listed on Bursa Malaysia and are the largest companies in the mobile telecommunications industry in Malaysia by subscribers and revenue.

The sample chosen was that of mobile telecommunications companies that were listed on the Bursa Malaysia. Given the limited number of mobile telecommunications companies listed on Bursa Malaysia, a census of the entire population of Bursa Malaysia listed mobile telecommunications companies was done. The sample therefore excluded all other mobile telecommunications companies in Malaysia, that were either private limited entities or public limited entities listed on share markets other than Bursa Malaysia.

The list of all Bursa Malaysia listed mobile telecommunications companies is given in the following Table 2.

Table 2: Sampling table of Bursa Malaysia listed mobile telecommunications companies

<b>Company Name</b>	<b>Bursa Malaysia Company Code</b>
Axiata Holdings	6888
Digi.com	6947
Maxis Berhad	6012

The study was performed on historical data. ROE, EPS, P/E and SG data was obtained from the individual company quarterly financial statements submitted to Bursa Malaysia. Share price data, details on company listing dates, and reporting periods were also obtained from Bursa Malaysia.

A summary of the data of the three companies is shown in Tables 3-5.

There are two general categories of research objectives for secondary data research: fact finding and model building according to the author in [23]. Since this paper is about establishing the extent to which ROE, EPS, P/E and SG individually influenced the share price, a model building is applied while using statistical inference to analyze the data. SPSS software was used to analyze the data.

The following steps were applied to perform a regression analysis:

A correlation analysis was used to determine the association between the share price of Bursa Malaysia listed mobile telecommunications companies and each one of the independent variables, ROE, EPS, P/E and SG.



Then a linear regression analysis was used to determine the relationship of ROE, EPS, P/E and SG with the share price of Bursa Malaysia listed mobile telecommunications companies. Multi co-linearity can distort the standard error of estimate, and may therefore lead to incorrect conclusions as to which independent variables are statistically significant according to the author in [24]. As a result the focus of the analysis was on simple regression results and not multiple regression results.

Table 3: Axiata Holdings independent and dependent variables data

Axiata	Share Price (RM)	EPS (RM)	PE	ROE	Sub Growth
28/4/2008 - 30/06/2008	6.77	0.10	67.70	3.88%	0.45%
Q3 2008	6.01	0.06	100.17	3.53%	0.54%
Q4 2008	3.90	-0.14	-27.86	2.35%	0.59%
Q1 2009	2.35	0.02	117.50	4.96%	0.60%
Q2 2009	2.30	0.06	38.33	0.55%	0.63%
Q3 2009	3.16	0.06	52.67	4.50%	0.68%
Q4 2009	3.03	0.07	43.29	4.31%	0.77%
Q1 2010	3.84	0.11	34.91	4.77%	0.98%
Q2 2010	3.92	0.07	56.00	4.88%	0.49%
Q3 2010	4.49	0.08	56.13	3.06%	0.80%
Q4 2010	4.68	0.04	117.00	3.39%	0.90%
Q1 2011	4.75	0.06	79.17	1.94%	1.10%
Q2 2011	4.98	0.08	62.25	2.70%	1.30%
Q3 2011	4.68	0.07	66.86	3.27%	1.50%
Q4 2011	4.93	0.06	82.17	2.91%	1.80%
Q1 2012	5.14	0.07	73.43	2.69%	2.00%
Q2 2012	5.42	0.08	67.75	2.61%	1.00%
Q3 2012	6.25	0.08	78.13	3.08%	2.30%
Q4 2012	6.63	0.07	94.71	3.28%	2.20%

Table 4: Digi.com independent and dependent variables data

Digi.com	Share Price (RM)	EPS (RM)	PE	ROE	Sub Growth
Q1 2007	1.69	0.33	5.12	14.04%	9.00%
Q2 2007	2.08	0.33	6.30	14.28%	4.00%
Q3 2007	2.25	0.36	6.25	15.59%	2.00%
Q4 2007	2.31	0.39	5.92	16.72%	5.00%
Q1 2008	2.31	0.39	5.92	18.39%	2.00%
Q2 2008	2.41	0.39	6.18	18.91%	1.00%
Q3 2008	2.28	0.36	6.33	17.11%	3.00%
Q4 2008	2.12	0.36	5.89	17.89%	4.00%
Q1 2009	2.12	0.35	6.06	14.52%	1.00%

Q2 2009	2.20	0.30	7.33	12.36%	1.00%
Q3 2009	2.15	0.31	6.94	12.87%	2.00%
Q4 2009	2.16	0.32	6.75	12.99%	4.00%
Q1 2010	2.26	0.36	6.28	18.29%	3.00%
Q2 2010	2.30	0.36	6.39	18.30%	2.50%
Q3 2010	2.40	0.37	6.49	19.02%	2.00%
Q4 2010	2.50	0.43	5.81	21.82%	3.00%
Q1 2011	2.76	0.43	6.42	24.61%	3.00%
Q2 2011	2.89	0.30	9.63	17.55%	3.10%
Q3 2011	3.06	0.38	8.05	21.72%	2.00%
Q4 2011	3.69	0.05	73.80	29.28%	3.20%
Q1 2012	3.94	0.04	98.50	22.72%	0.20%
Q2 2012	4.14	0.04	103.50	22.97%	0.70%
Q3 2012	5.01	0.04	125.25	22.34%	0.20%
Q4 2012	5.23	0.03	174.33	17.40%	2.90%

Table 5: Maxis Berhad independent and dependent variables data

Maxis Berhad	Share Price (RM)	EPS (RM)	PE	ROE	Sub Growth
19/11/2009 - 31/12/2009	5.38	0.07	80.30	5.40%	4.70%
Q1 2010	5.34	0.07	72.16	5.30%	3.30%
Q2 2010	5.31	0.07	74.79	6.17%	2.20%
Q3 2010	5.35	0.08	66.88	5.95%	4.30%
Q4 2010	5.31	0.08	65.56	6.72%	3.20%
Q1 2011	5.39	0.07	74.86	6.82%	3.10%
Q2 2011	5.47	0.07	74.93	6.22%	3.00%
Q3 2011	5.33	0.07	74.03	6.36%	2.40%
Q4 2011	5.48	0.12	45.67	6.20%	2.30%
Q1 2012	5.98	0.08	78.68	10.39%	2.30%
Q2 2012	6.38	0.06	102.90	7.07%	2.20%
Q3 2012	6.81	0.06	115.42	5.74%	2.00%
Q4 2012	6.57	0.05	131.40	5.46%	1.80%

### 3. Results

The study found that the relationship between common financial statement ratios and future share price performance is not general but specific; the relationship varied from company to company for mobile telecommunications companies listed on Bursa Malaysia. Furthermore the study found that the mobile telecommunications industry sector widely published non-financial performance measure of subscriber growth had a weak relationship with future share price performance for mobile telecommunications companies listed on Bursa Malaysia.

The results of the study are summarized in Table 6.

Table 6: Summary of results of relationship between performance measures and subsequent share price

	EPS	PE	ROE	SG
<b>Axiata</b>	NC	NC	NC	19.70%
<b>Digi</b>	72.80%	90.40%	28.30%	16.40%
<b>Maxis</b>	NC	72.00%	NC	29.50%

Where NC – no correlation

% - adjusted R Square values

Axiata–the study indicates that common financial statement ratios, namely EPS, PE, and ROE, and the non-financial performance measure of Subscriber Growth, are all poor performance measures for predicting future share price performance of Axiata in the subsequent quarter on Bursa Malaysia. This means that other performance measures not within the scope of this paper may exist which may be better performance measures to make investment decisions based upon for Axiata.

Digi - the study indicates that EPS and PE are the best performance measures to be used for predicting future share price performance of Digi in the subsequent quarter on Bursa Malaysia. On the other hand ROE and SG are poor performance measures for predicting future share price performance of Digi in the subsequent quarter on Bursa Malaysia.

Maxis - The study indicates that PE is the best performance measure to be used for predicting future share price performance of Maxis in the subsequent quarter on Bursa Malaysia. On the other hand EPS, ROE and SG are poor performance measures for predicting future share price performance of Maxis in the subsequent quarter on Bursa Malaysia.

#### 4. Discussion

The evidence of this research paper indicated that there were different variables of performance measures for each company that significantly predicted the future share price of the subsequent quarter. Furthermore whilst one variable had a strong relationship with future share price for one company, the same variable may not have any correlation with subsequent share price for another company.

The results indicated that earnings per share had a significant, strong and negative linear relationship with share price for Digi. End of quarter earnings per share of Digi predicted the subsequent quarter’s average share price (simple moving averages) with 72.8% variance. However earnings per share had no association (correlation) at all with subsequent share price for Axiata and Maxis. The strong relationship between earnings per share and subsequent share price may be an indication that investors in Digi make their decisions based on the earnings performance of the company. The reason for the negative relationship between earnings per share and the

subsequent quarter's share price for Digi is likely to be the effect of expectations of investors. When the earnings per share of Digi increased in a particular quarter, there was a tendency of the share price in the subsequent quarter to go on a downward trend as investors took profits by selling off the share. However when the earnings per share of Digi decreased in a particular quarter compared to the previous quarter, there was a tendency of the share price in the subsequent quarter to go on an upward trend as investors wagered for an improved performance in earnings based on past performance which previously exceeded the decreased earnings per share.

The results indicated that price earnings ratio had a significant, strong and positive linear relationship with share price for Digi and Maxis. End of quarter P/E ratio predicted the subsequent quarter's average share price (simple moving averages) with 90.4 % and 72.0% variance for Digi and Maxis respectively. However P/E ratio had no association (correlation) at all with subsequent share price for Axiata. The P/E ratio is an indication of how much investors are willing to pay per dollar earnings, and it is therefore closely related to earnings; it follows that P/E ratio has a strong relationship with subsequent share price for Digi for the same reasons as earnings per share discussed in the above paragraph; whilst the reason for the difference in the relationship of earnings per share and future share price for Maxis, versus that of its price earnings ratio and future share price may be due to market perceptions of Maxis market value per share versus its earnings per share.

The results indicated that return on equity had a significant, moderate and positive linear relationship with share price for Digi. However ROE only predicted the subsequent quarter's average share price for Digi with 28.3% variance – a poor indicator compared to EPS and P/E. ROE had no association (correlation) at all with subsequent share price for Axiata and Maxis. The research therefore indicated that ROE is a poor predictor of subsequent share price for mobile telecommunications companies listed on Bursa Malaysia, contrary to findings of the author in [11].

The results indicated that Subscriber Growth had a significant, moderate and negative relationship with share price for Axiata; whilst there was a significant, moderate but positive relationship with share price for Maxis. However Subscriber Growth only predicted the subsequent quarter's share price with 19.7% variance for Axiata, 16.4% variance for Digi and 29.5% variance for Maxis – a poor indicator therefore.

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