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Shariah-Compliant Stocks in the Philippines: Predicting Performance using Logistic Regression

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Abstract

It is common for investors to shift their interests from high risk, high return financial securities to low-risk investments, especially during periods of economic uncertainties. One of the options that have enticed equity investors around the world was Shariah-compliant stocks. These stocks were deemed less risky than conventional stocks partly due to their subscription to the Islamic laws of doing business that discourages excessive risks and profits. In the Philippines, it was only in 2014 when publicly-listed stocks were certified as Shariah-compliant. This study aimed to determine the goodness-of-fit, accuracy rate, and impact of five (5) financial ratios in predicting the stock performance of the top 30 Shariah-compliant stocks in the Philippines based on market capitalization. The ratios used were Earnings per Share (EPS), Book Value per Share (BVPS), Price to Book Value (PBV), Price to Earnings (PE), and Price to Sales (PS). Both descriptive and quantitative methods were utilized. Stock returns were initially classified into binary variables of "good" stock and "poor" stock. Using binary logistic regression, this study resulted in an accuracy level of 60.6%. Compared to previous research, the results showed little indication of goodness of fit despite a high accuracy rate. This may be attributed to the difference in the financial ratios and sectors used. The individual impact of the independent variables toward the dependent variable was also not significantly similar to other studies. For this reason, the researcher recommended for future studies to increase sample size and financial ratios, using macroeconomic variables and use hybrid statistical methods to test the model.

Keywords: *Stock performance, financial ratios, Shariah-compliant stocks, Logistic regression*

Introduction

It is only natural for equity investors to look into financial securities that have little to no risks, especially during periods of financial crises. Shariah-compliant stocks are equity instruments that have passed the screening of a designated Board as being lawful according to Islamic laws for not being involved in liquor, swine, or usury (riba) businesses. It introduces the concept of *mudrabah*, where the "profit is shared according to predetermined mutually agreed upon ratio." (Alam et al., 2017, p. 2) Many studies have proven that shariah-compliant stocks perform better compared to conventional stocks, especially during a crisis. (Reddy & Fu, 2014; Bakar & Ali, N, 2014; and Jawadi, Jawadi, & Louhichi, 2014)

On July 7, 2014, the Philippine Stock Exchange (PSE) released a memorandum on encouraging Filipino Muslims to be part of nation-building through investments in shariah-compliant stocks. It is also meant to access a global investor base amounting to USD 1.3 trillion funds that seek low-risk investments (Philippine Stock Exchange, 2014). In this current pandemic, the uncertainties that lie ahead will once again make these stocks palatable to

investors. Appendix A provides a summary of the top 30 Shariah-compliant companies based on market capitalization. The author used PSE memorandum CN - No. 2020-0001 dated January 3, 2020, since it was the most recent posting of Shariah-compliant stocks at the time of writing. In this list, the number of shariah-compliant stocks is down to 48 companies from 60 previously. The relatively new concept of certifying publicly-listed stocks in the Philippines makes it understandable why there are few research studies done about this topic.

In this light, this study will address the question, "what is the probability that a stock performance is predicted to be either good or bad, given the financial ratios EPS, BVPS, PBV, PE, and PS?" Specifically, the objectives of this study are 1. To determine the goodness-of-fit and accuracy rate of using the financial ratios for predicting the stock performance of the top 30 Shariah-compliant stocks in the Philippines based on market capitalization; and 2. To identify the individual financial ratios that affect the performance of Shariah-compliant stocks.

Studies about predicting stock performance are quite common, especially in a conventional equities market setting. For instance, Dutta, Bandopadhyay, & Sengupta (2012) used financial ratios of the 30 largest publicly listed companies in the Indian stock market over four years to predict a good or bad stock. The study resulted in a 74.6% level of accuracy. Similarly, Nataraja, Chilale, and Ganesh (2017) performed the same method and found an accuracy level of 78%. Meanwhile, Ali, Mubeen, Lal & Hussain (2018) studied 109 non-financial firms from the Pakistan Stock Exchange and found out that their model is 89.77% accurate in predicting good and bad companies. More recently, Kambeu (2019) applied a similar method but this time, using data from the Botswana Stock Exchange to understand how trading volume predicts the daily stock market movement. Dutta et al. (2012) and Ali et al. (2018) posited that the Logistic Regression (LR) method of predicting performance is practical and helpful to investors and portfolio managers to identify "outperforming" stocks.

Understanding stock performance is essential to the study of the economy of a country. According to Rakhal (2018), "the stock market plays a key role in the mobilization of capital in emerging and developed countries, leading to the growth of industry and commerce of the country, as a consequence of liberalized and globalized policies adopted by most emerging and developed government." (p. 134). Thus, it understandable why most Finance researchers have given much importance to stock performance prediction (Jadhav, He, and Jenkins, 2016).

Framework

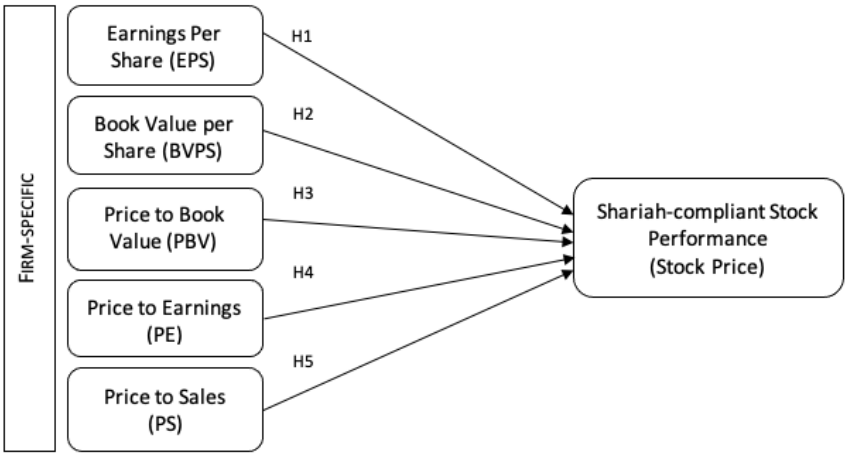
In the literature review of Ruhani, Ahmad, and Islam (2018), they have provided the fundamental underlying theories of stock performance. The pre-modern era cover most of the textbook theories taught in Basic Finance class such as "Bernoulli's Definition and Measure of risk, Irving Fisher's Asset return in terms of probability Distribution, Keyne's Liquidity Preference Theory, Marsckak's Preference for investment by Indifference curve in mean-variance space, Neuman&Morgen's Theory of choice under uncertainty play a vital role in the pre-modern era in financial theories." (p.52)

Perhaps one of the most famous modern theories of Finance about stock performance is Modern Portfolio Theory/Mean-Variance Analysis that emerged in 1952. It posits that the standard deviation can be used to measure risk and return. Later in 1958, Modigliani and Miller earned the title of the founder of modern Finance because of their Theory of Capital Structure. This theory provides that the distribution of dividends maximizes shareholder's wealth; thus, it is an accurate measure of stock performance. (Ruhani, Ahmad and Islam, 2018)

Other theories of stock performance that has been utilized in relevant studies as discussed in the following sections are Capital Asset Pricing Model (John, 2019; Batac and Tatlonghari, 2011), Efficient Market Hypothesis (Dayag and Trinidad, 2019), and Arbitrage Pricing Theory (Wahyudi et al., 2017; John, 2019)

As shown in the conceptual framework below, the dependent variable of this study is stock performance. Based on existing literature, the most common measures of stock performance are the stock price (Sha, 2017; Avdalović&Milenković, 2017; Wahyudi et al., 2017; Ferrer &Tang, 2016), the Earnings per Share (Dayag& Trinidad, 2019; Ho and Odhiambo, 2018;) and the Return on Asset (Jiraporn et al.,2019; Sufian& Chong, 2008; Chunhachinda&Padungsaksawasdi, 2019). This study will use stock price to measure the performance of Shariah-compliant companies in the Philippines. This is to apply previous studies that also used binary logistic regression as their statistical tool. (Dutta et al., 2012; Ali et al., 2018). Added to that, Carl (2019) posited that the use of a stock's historical price data would aid brokers, investors, and researchers to predict stock price and market movements.

Figure 1
Conceptual Framework



Meanwhile, the independent variables are market value financial ratios, namely 1. Earnings per Share (EPS) 2. Book Value per Share (BVPS) 3. Price to Book Value (PBV) 4. Price to Earnings (PE) and 5. Price to Sales (PS). The definition of each variable and the corresponding hypotheses are as follows:

Earnings per Share (EPS) – This ratio is the result of dividing net profit from the number of shares outstanding. While it gives stakeholders the idea about the company's profitability per share, studies (Sha, 2017; Avdalović and Milenković, 2017) upheld that EPS is a significant predictor of stock prices. For this reason, this study will test if there is a significant relationship between EPS and stock performance of Shariah-compliant stocks. **(H1)**

Book Value Per Share (BVPS) – This ratio provides information about the book value of the company per outstanding number of shares. Similar to EPS, Avdalović and Milenković (2017) used data from 42 companies in Serbia from 2010 to 2014 and found out that BVPS is also significant in predicting stock prices. Other studies (Dutta et al., 20120; Shah, 2017; Upadhyay, Bandopadhyay, and Dutta, 2012) also support the same finding. Hence, this study

will test if there is a significant relationship between BVPS and the stock performance of Shariah-compliant stocks. **(H2)**

Price to Book Value (PBV) – This ratio gives information on the ratio between the market price of the shares to its book value. PBV is significant in predicting stock prices (Dayag & Trinidad, 2019; Avdalović and Milenković,
2017; Dutta et al., 20120; Shah, 2017; Upadhyay et al., 2012; Ali et al., 2018; Kumar & Babu, 2018). Thus, this study will test if there is a significant relationship between PBV and the stock performance of Shariah-compliant stocks. **(H3)**

Price to Earnings (PE) – This ratio is used to check the current price of the shares of stocks against the earnings of the company. Ferrer and Tang (2016) gathered data from the service industry from 2006-2010 to report that PE has a significant impact on the stock price. This is also evident in Dutta et al. (2012) and Kumar & Babu (2018). For this reason, this study will test if there is a significant relationship between PE and stock performance of Shariah-compliant stocks. **(H4)**

Price to Sales (PS) – This ratio is computed by dividing the stock price by the total sales. Although not commonly used to predict stock performance, Andari and Alin (2018) used PS along with Cash Flow Ratio to determine their influence on share returns of retail companies that are listed in the Indonesian Exchange. The study found that both ratios have effects on stock returns. Tehrani, Ansari, and Hasani (2014) also used the PS ratio to determine growth stocks from value stocks and found out that PS was one of the most important ones among other ratios used in the study. Hence, this study will test if there is a significant relationship between PS and stock performance of Shariah-compliant stocks. **(H5)**

This study assumes that the year-end stock price of each of the thirty Shariah-compliant stocks from 2014 to 2019 is a valid measure of stock performance. Further, since a majority of the data will be gathered from the online brokerage account AB Capital Securities (www.abcapital.com.ph), it will be assumed that all these data are reliable and credible since the site cites the Philippine Stock Exchange, Bangko Sentral, and the individual company websites as sources of their reports.

Methodology

Both descriptive correlational and causal research methods were utilized for this study. The descriptive research design was used in determining the average of firm-related variables of Shariah-compliant stocks from 2014-2019. Correlational research was used to investigate the relationship between the variables.

The most recent list of Shariah-compliant stocks as of writing was released through PSE memorandum CN - No. 2020-0001 dated January 3, 2020. From this list, the top 30 largest companies based on market capitalization became the subject interest of this study. These 30 companies comprise 99.36% of market capitalization. The breakdown of these 30 companies is provided in Appendix A.

The data utilized are secondary and were collected from the financial statements of the selected companies, Bangko Sentral ng Pilipinas, Philippine Stock Exchange, Securities, and Exchange Commission through a private online broker/trading account called AB Capital Securities (www.abcapital.com.ph) in which the author is a long-time client and subscriber.

Other reputable financial services providers such as Wall Street Journal, Bloomberg, Marketwatch, and Yahoo Finance were also utilized. Before data cleaning and assumption check, 150 data were gathered from these secondary sources. However, data for some variables are not available. As a result of data cleaning, the total sample data (n) is now 132.

This study utilized both Descriptive Statistics and Regression Analysis. Descriptive statistics were used to determine the mean and the standard deviation between the variables. Meanwhile, binomial logistic regression was used in determining the level of accuracy of predicting stock performance. The statistical tools that will be used are Microsoft Excel, R Studio, Jamovi, and Statistical Package for Social Sciences (SPSS).

The analytical method used in this study was Binary Logistic Regression. One of the advantages of Logistic Regression (LR) compared to discriminant analysis and multiple regression is its leniency in terms of assumptions of normality, heteroscedasticity, and even linear relationship between the data (Hair et al., 2009). Although there are a lot of methods used in predicting the performance of stocks, studies from Li, Sun, & Wu (2010), Chen (2011), Dutta et al. (2012), and Ali et al. (2018) concluded that LR models produce a high level of accuracy rate in predicting stock performance. Hassan, Zainuddin, & Nordin (2017) further enumerated that the advantages of using logistic regression in predicting models include: 1) the lack of distributional assumptions for independent variables, and 2) lack of linearity assumptions and prior probabilities.

Before testing the model, the first step taken was to classify the stock returns into binary variables of a "good" stock and a "poor" stock. In doing this, the researcher utilized the method used by Dutta et al. (2012) and by Ali et al. (2018). The changes in the stock prices were compared to the changes in the market return. If the performance of the stock is higher than the market, then it is classified as a “good” stock. Inversely, if the performance of the stock is lower than the market, then it is classified as a “poor” stock. The proxy used for market return is the change in the Philippine Stock Exchange Index (PSEi) value. The formula for the return on stock and market return (Dutta et al., 2012) are as follows:

Return on stock $= \frac{P_t - P_{t-1}}{P_{t-1}} \times 100$, *where* P_t *is the current price, and* P_{t-1} *is the Price at T-1 year*

Market return $= \frac{PSEi_t - PSEi_{t-1}}{PSEi_{t-1}} \times 100$, *where* $PSEi_t$ *is the current price and* $PSEi_{t-1}$ *is the Price at T-1 year*

Discussion of Results

Assumptions of Binomial Logistic Regression

The assumptions of logistic regression were tested before running the proposed model. The normality of data for binomial logistic regression need not be assumed (Osborne, 2015). However, multicollinearity and extreme variables are very important. Table 1 below summarizes the result of the Variance Influence Factor (VIF) and Tolerance. Generally, a VIF of more than 10 and tolerance of less than 0.10 suggest multicollinearity of data. In this case, we can see that there is no multicollinearity among the predictors of the proposed model.

Further, R was used to determine the Cook's distance. Two outliers were removed from the data as a result. Using R, the Cook's Distance of the data shows that there are two outliers (Appendix B). According to Kassambara (2018), values with extreme variables should be dropped.

Table 1
Collinearity Statistics

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	EPS	.244	4.090
	BVPS	.244	4.103
	PE	.991	1.010
	PBV	.984	1.016
	PS	.987	1.013

a. Dependent Variable: PerfCode

Goodness-of-Fit

The summary of descriptive data is found in Appendix C of this study. Meanwhile, the goodness-of-fit for the proposed model was tested using the Omnibus Test, Hosmer-Lemeshow and Cox & Snell in SPSS, as shown in Table 2 below. The Omnibus Test provides information on the explained and unexplained variance in the datasets (Dutta, 2012). The results from the likelihood ratio chi-square tests show no indication that the model fits the data significantly better than a null model, $\chi^2(5)=9.532$, $p=.090$.

Table 2
Goodness-of-fit Tests

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	9.532	5	.090
	Block	9.532	5	.090
	Model	9.532	5	.090

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	12.247	8	.141

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	172.366[a]	.070	.093

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

The Hosmer and Lemeshow Test, however, supports the global fit of the model. In this test, the non-significant result (p = .141) indicates the goodness of fit.

The Model Summary table in SPSS, on the other hand, includes two different ways of estimating R-square (Leech et al., 2005). These "pseudo" R2 estimates (.070 and .093) indicate that approximately 7% or 9% of the variance in "good" or "poor" stock performance can be predicted from the linear combination of the five independent variables. The Cox & Snell R2 (7%) is usually an underestimate.

Level of Accuracy

The Classification Table generated in SPSS shows the level of prediction accuracy between the observed and predicted data (Dutta et al., 2012). This study shows that the percentage of correctly classified cases as "poor" performing stocks is 58.3%, while the classification rate for "good" performing stocks is 62.5%. The overall classification accuracy percentage was observed to be 60.6% of original grouped cases.

Table 3
Classification Table

Observed			Predicted		
			PerfCode		Percentage
			Poor	Good	Correct
Step 1	PerfCode	Poor	35	25	58.3
		Good	27	45	62.5
	Overall Percentage				60.6

a. The cut value is .500

a. The significant relationship among EPS, BVPS, PBV, PE, PS and stock performance

The final logistic regression equation is estimated by using the maximum likelihood estimation for classifying a company:

Z = -.239 + .052 *EPS* - .005 *BVPS* +. 003 *PE* + 1.945 *PE* +.079 *PBV* +.000 *PS*
Where: *z= log (p/1-p),* and 'p' is the probability that the outcome is GOOD.

Table 4
Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	EPS	.052	.039	1.804	1	.179	1.053	.976	1.136
	BVPS	-.005	.005	1.069	1	.301	.995	.985	1.005
	PE	.003	.002	2.901	1	.089	1.003	1.000	1.006
	PBV	.079	.062	1.642	1	.200	1.082	.959	1.221
	PS	.000	.001	.166	1	.684	1.000	.998	1.003
	Constant	-.239	.274	.762	1	.383	.788		

a. Variable(s) entered on step 1: EPS, BVPS, PE, PBV, PS.

Using the Wald Statistic test, the following results have been found:

Earnings per Share (EPS) is a positive but not significant (b=.052, s.e.=.039, p=.179) predictor of the probability of good performance. Hence, **H1** is rejected.

Book Value Per Share (BVPS) is a negative but not significant (b=.-005, s.e.=.005, p=.301) predictor of the probability of good performance. Hence, **H2** is rejected.

Price to Book Value (PBV) is a positive but not significant (b=.079, s.e.=.062, p=.200) predictor of the probability of good performance. Hence, **H3** is rejected.

Price to Earnings (PE) is a positive but not significant (b=.003, s.e.=.002, p=.089) predictor of the probability of good performance. Hence, **H4** is rejected.

Price to Sales (PS) is a positive but not significant (b=.000, s.e.=.001, p=.684) predictor of the probability of good performance. Hence, **H5** is rejected.

Conclusion

This study showed little indication of the goodness of fit of the model despite having an accuracy level of 60.6%. Based on Upadhyay et al. (2012), this accuracy level is already considered a high predictive accuracy rate. However, the findings in this research are not consistent with the result of previous studies. In Dutta et al. (2012) and Ali et al. (2018), their model is a global fit as indicated by the Omnibus Test of Model Coefficient and Hosmer and Lemeshow Test. The overall percentage of accuracy level is 74.6 % and 88.4% in Dutta et al. (2012) and Ali et al. (2018), respectively. This may be attributed to the difference in the financial ratios and the sectors used. In Dutta et al. (2012), the variables used were Net Sales (NS), Book Value (BV), Cash Earnings per Share (CEPS), Price/Cash Earnings per Share (PECEPS), Price to Earnings (PE), Profit Before Interest Depreciation and Tax/Sales (PBIDTS), Sales/Net Assets

(SNA) and Price/Book value (PEBV) and they also used the most actively traded companies on the Indian stock exchange. Meanwhile, Ali et al. (2018) used Earnings per share (EPS), Price to Book value (PB), Return of Equity (ROE), Current Ratio (CR), Debt to Equity (DE), and Percentage changes of Net Sales (Sales) as their independent variables. On the other hand, this study utilized only five market value financial ratios of Shariah-compliant stocks based on market capitalization. The variation in the variables and the sectors may be a possible explanation for the difference in the result of previous studies and this study.

As to the individual impact of the financial ratios, this study found that the independent variables were not significant predictors of good stock performance. Unlike the goodness-of-fit test, the result of this study is consistent with the studies of Dutta et al. (2012) and Ali et al. (2018). Some of the reasons for having insignificant p-values with high accuracy levels may be attributed to multicollinearity and small sample size (Vakhitova & Alston-Knox, 2018). However, multicollinearity was tested in this study and the anchor articles, so this event could be attributed to the small sample size. This study used 132 samples, while Dutta et al. (2012) used 118 data from companies in the Indian Stock Exchange and Ali et al. (2018) used 109 data from non-financial firms in the Pakistan Stock Exchange.

Implication to Practice

Currently, financial markets around the world have suffered the consequences of the COVID19 pandemic. The "bloodbath" in the equities market brought losses to many investors. Since this model has a high level of accuracy (Upadhyay et al., 2012) in predicting the stock

performances, it may aid Filipino investors to gauge, identify, and decide which Shariah-compliant stocks to buy, hold, or sell depending on their risk appetite and investment goals. Further, this study may help fundamental stock analysts to re-assess the financial ratios that they use in predicting stock performance.

Implication to Research

This study mainly contributes to the scarce research about the stock performance prediction of Shariah-compliant stocks in the Philippines. As an under-studied topic in the Philippine equities market, the author hopes that this study has added to the pool of research about Shariah-compliant financial instruments. Further, the result of this study upheld that conventional stock models may also be applied to Shariah-compliant stocks in predicting performance. The lack of interest in Shariah-compliant stocks in the Philippines compared to our neighboring countries may often be attributed to the stigma that these stocks are distinct in characteristics from conventional equities. Lastly, this study contributes to the existing literature by examining the reason behind the lack of significance among the market value financial ratios but with a high level of accuracy.

Limitations and Recommendations for future Research

The limitations of this research will also be the source of recommendation for future research. First, this study is limited by the sample size and the number of financial ratios used. Future researchers may increase the size of their data and must also consider other financial ratios that other studies identified as significant predictors of stock performance.

Second, this study did not use macroeconomic variables such as GDP, Inflation, and Foreign Exchange rate. Future researchers who wish to improve this study can include these macroeconomic variables in their model.

Lastly, this study is limited to only one statistical method. Jadhav, He, and Jenkins (2016) and Zhu et al. (2011) posited that the best way of predicting stocks is through hybrid methods of qualitative and quantitative tools. This could be incorporated in future studies as well.

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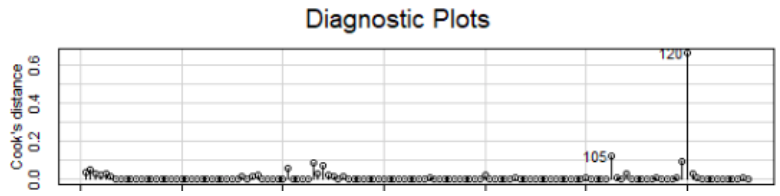
Appendix A

Top 30 Shariah-compliant stocks based on market capitalization (Source: Author)

	PSE ID	Company Name	Shares	Market Capitalization	Percentage
1	MER	Manila Electric Company	1,127,098,705	290,791,465,890	25.90%
2	HVN	Golden Bria Holdings, Inc.	644,117,649	259,579,412,547	23.12%
3	HLCM	Holcim Philippines, Inc.	6,452,099,144	85,425,792,667	7.61%
4	SCC	Semirara Mining and Power Corp.	4,250,547,620	80,760,404,780	7.19%
5	WLCON	Wilcon Depot, Inc.	4,099,724,116	70,925,227,207	6.32%
6	EAGLE	Eagle Cement Corp.	5,000,000,005	45,400,000,045	4.04%
7	DNL	D&L Industries Inc.	7,142,857,990	44,285,719,538	3.94%
8	STR	Vistamalls, Inc.	8,425,981,156	41,287,307,664	3.68%
9	HOME	AllHome Corp.	3,750,000,002	36,750,000,020	3.27%
10	LBC	LBC Express Holdings Inc.	1,425,865,471	18,251,078,029	1.63%
11	RFM	RFM Corp	3,456,234,758	17,281,173,790	1.54%
12	2GO	2GO Group, Inc.	2,462,146,316	16,988,809,580	1.51%
13	FEU	Far Eastern University, Inc.	16,477,023	13,181,618,400	1.17%
14	ALLHC	AyalaLand Logistics Holding Corp.	6,301,591,987	12,225,088,455	1.09%
15	CIC	Concepcion Industrial Corp.	403,218,091	11,491,715,594	1.02%
16	MAC	Macroasia Corporation	1,575,798,693	11,030,590,851	0.98%
17	SUN	Suntrust Home Developers, Inc.	7,250,000,000	10,150,000,000	0.90%
18	PPC	Pryce Corporation	1,983,258,269	8,924,662,211	0.79%
19	CPM	Century Peak Metals Holdings Corporation	2,820,330,450	7,332,859,170	0.65%
20	ANI	AgriNurture, Inc.	1,018,274,088	7,015,908,466	0.62%
21	IRC	Philippine Infradev Holdings Inc.	6,061,560,322	4,546,170,242	0.40%
22	FNI	Global Ferronickel Holdings, Inc.	5,467,994,829	3,554,196,639	0.32%
23	LC	Lepanto Consolidated Mining Co. "A"	39,822,869,196	3,384,943,882	0.30%
24	ATN	ATN Holdings, Inc. "A"	3,700,000,000	3,108,000,000	0.28%
25	NOW	Now Corporation	1,672,572,468	2,676,115,949	0.24%
26	LCB	Lepanto Consolidated Mining Co. "B"	26,552,888,901	2,310,101,334	0.21%
27	CIP	Chemical Industries of the Phils.	10,296,601	1,853,388,180	0.17%
28	GREEN	Greenergy Holdings, Inc.	1,800,778,572	1,836,794,143	0.16%
29	MARC	Marcventures Holdings, Inc.	3,014,820,305	1,688,299,371	0.15%
30	ORE	Oriental Peninsula Resources Group, Inc.	2,878,500,005	1,669,530,003	0.15%
		TOTAL	160,587,902,732	1,115,706,374,647	99.36%

Appendix B

Cook's Distance



Appendix C

Descriptives

	Performance	EPS	BVPS	PE	PBV	PS
Mean	Good	4.36	24.6	78.6	3.68	37.0
	Poor	2.58	22.2	15.9	2.66	36.3
Median	Good	0.320	2.15	18.2	2.41	3.47
	Poor	0.0462	1.63	14.8	1.53	3.51
Standard deviation	Good	12.6	78.8	227	4.63	131
	Poor	9.31	78.1	118	2.81	173
Variance	Good	158	6208	51612	21.4	17281
	Poor	86.6	6105	13883	7.88	29941
Skewness	Good	3.95	4.36	4.48	4.67	6.53
	Poor	3.74	4.87	0.823	2.49	6.81
Std. error skewness	Good	0.281	0.281	0.281	0.281	0.281
	Poor	0.311	0.311	0.311	0.311	0.311
Kurtosis	Good	16.6	18.6	23.8	27.9	48.3
	Poor	14.9	23.8	21.7	7.54	48.6
Std. error kurtosis	Good	0.555	0.555	0.555	0.555	0.555
	Poor	0.613	0.613	0.613	0.613	0.613