

## The Reliability of Constant Growth Dividend Discount Model (DDM) in Valuation of Philippine Common Stocks

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### Abstract

The constant growth dividend discount model (DDM) is said to be the simplest and most popular valuation method to estimate the intrinsic value of the company's stocks. This study is aimed to test the reliability of the constant growth DDM in valuation of the selected common stock listed companies in the Philippine Stock Exchange (PSE). The accuracy of constant growth DDM to predict the value of common stocks was compared from the actual values using the symmetric median absolute percentage error (sMdAPE), and then tested whether the median difference between the predicted and actual values of the selected common stock listed companies were significant using the Wilcoxon signed-rank test. Results of the study showed that majority of the companies had a sMdAPE less than 30%. This means that the error to predict the common stock values among the companies was less than 30%. Furthermore, the predicted values of 15 common stock companies were not significantly different from the actual values (predicted values were statistically the same with the actual values). The results are jibed with the theory that using the dividends per share can predict the common stock prices using the constant growth DDM. Based on the model, investors are willing to buy, hold or sell the stock. Therefore, the constant growth DDM is a reliable model to predict the common stock prices among the 15 companies listed in the PSE.

**Keywords:** Common stocks; Constant growth; Dividend discount model (DDM) intrinsic value; Philippine stock exchange (PSE)

### Introduction

A stock is a type of security that signifies ownership in a corporation and represents a claim on the part of the corporation's assets and earnings. It has two main types: common stocks and preferred stocks. Common stocks entitle the owner to vote at shareholders' meetings and to receive dividends. While, preferred stocks have no voting rights, but have a higher claim on assets and earnings than the common shares [1]. These stocks are bought and sold at stock market just like in the Philippine Stock Exchange (PSE) that governs local stock market.

As of December 29, 2016, the PSE had 272 common stock listed companies with a total market capitalization of PhP 12.9 trillion with 134 active trading participants registered. Figure 1 shows the stock market highlights from 2012 to 2016. In the year 2012, the PSE became the second best performing stock exchange in Asia next to Thailand with a 32.2% year-to-date increase. This was due to the overall confidence of emerging economies at the start of the year. The Philippine economy survived in the Global Financial Crisis on 2011 which became an impetus for investors to take a look at the Philippine stocks. Another reason was the reduction of external risks to the Philippine economy in which the Euro crisis was worsening and the United States economy was weakening.

In year 2013, however, the PSE index value became volatile. The average annual growth rate was 0.49%. This was mainly due to the US Federal Reserve's taper issue caused by the local stock market to wipe-out year-to-date gained three times [2]. In year 2014, the PSE index value gained its momentum. This was due to the falling of oil prices that created prosperity in the country. At the same time, a strong base of non-oil stocks in PSE, a series of Initial Public Offerings (IPOs) expected before 2016 and strong corporate earnings were the reasons why PSE index sustained its winning streak. The economic growth of the country became 6.9% at the fourth quarter, making it one of the top performers in Asia.

In the year 2015, the PSE index value opened up with so much optimism and it was riding up a very steady uptrend from January to April which eventually brought to its highest close of 8,127.48 on April 10, 2015. However, after hitting that mark, the PSE index started to reverse until an 8-month downtrend was experienced. This was mainly due to the economic slowdown in China and a greater fall of oil prices affected by the Middle-East countries which were heavily relied on oil exports. The Philippine economy was affected since China and Middle-East countries are the major trading partners in the country [3]. In the year 2016, PSE index recovered during the first half due to the investors' positive confidence to retain the economic growth of the country by the next administration. However, the second half of 2016 during the Duterte's administration, the PSE index dropped caused by a looming rate hike of the US Federal Reserve and President Duterte's tirades against the US, one of the country's biggest trading partners [4].

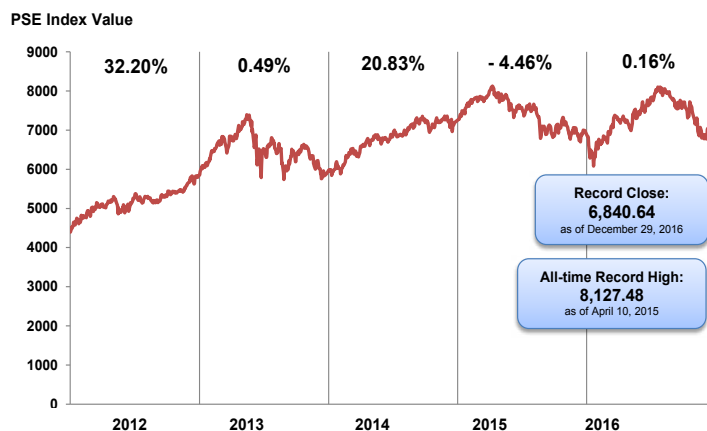
Investors buy or invest in stocks to benefit from a company's remarkable value potential over time. Once the investors buy or invest into a stock, he or she becomes the co-owner or a shareholder of a particular company. A holder of a stock or a shareholder has a claim to a part of the corporation's assets and earnings, *i.e.*, co-owner of a company. Ownership is determined by the number of shares a person owns relative to the number of outstanding shares. If the shareholder owns the company's assets or earnings, that person claims a portion of the company's earnings called dividend. A dividend is the allocation of

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**Received** January 18, 2018; **Accepted** February 23, 2018; **Published** February 28, 2018

**Citation:** Gacus RB, Hinlo JE (2018) The Reliability of Constant Growth Dividend Discount Model (DDM) in Valuation of Philippine Common Stocks. Int J Econ Manag Sci 7 487. doi: [10.4172/2162-6359.1000487](https://doi.org/10.4172/2162-6359.1000487)

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Source: Philippine Stock Exchange (PSE), Inc.

Figure 1: Stock market highlights from 2012 to 2016 (as of December 2016).

a company's net profit or earnings to shareholders in the form of cash payments, as shares of stock or other properties [5]. Dividends may be declared out of a corporation's unrestricted retained earnings which shall be payable in cash, in property, or in stock to all stockholders on the basis of outstanding stock held by them under the Philippine law. The amount of retained earnings available for declaration as dividends may be determined pursuant to regulations issued by the Securities and Exchange Commission (SEC). The approval of the board of directors is generally sufficient to approve the distribution of dividends, except for the stock dividends that requires the approval of stockholders.

Dividends, moreover, attract investors especially for those dividend-oriented stock investors to buy or invest stocks from stable and matured companies that paid out dividends. In the Philippines, those PSE listed companies that are likely to declare good dividends in 2012 include those from the telecom, utilities and media sectors. Dividends paid by the PSE listed companies are one way of boosting shareholders value that can be a gauge for a financial well-being of companies. Dividends are becoming an important driver of investments especially that the share of dividends to the total return of PSE over the past decade was about 40 percent [6].

As of 2011, the PSE Index registered a 4.5% rise while the average dividend yield was about 3%, resulting in total return of about 7.5%. This kind of return is indeed impressive in which these investors are willing to buy or invest to become shareholders of PSE listed companies that give dividends.

To be a shareholder in a specific company, the investor must choose what attractive securities like stocks to invest into, what degree of the investment is and when the investment ought to be made. The investment environment incorporates the types of attractive stocks that exist, where and how they are purchased or sold. Putting investment into a stock trade is a pledge of funds for a specific time frame, keeping in mind that the end goal of the investor is to determine the rate of return to compensate for the time in which the funds are invested, the normal rate of inflation amid that time, the liquidity premium (a premium that cannot be effortlessly changed over into money for its fair market value) and the risk included. At the point when an investor confers certain funds, he expects a stream of returns over the time of ownership. The investor could be an individual, a government, a pension fund or a corporation [7]. In this way, the investor trades a

known sum today for some expected future stream of payments that will be more prominent than the present expense. Since an investment includes giving up of the current amount of pesos for the future amount of pesos, time and risk must be mullied over. The sacrifice they made today is sure, while the returns expected later are uncertain.

Choosing what attractive stocks to invest into, investors utilize different investment tools to estimate the intrinsic or the true value of a stock. At the point when the investors need to see whether the dividends paid by the companies are precisely consistent with the true value or actual price of a stock, dividend discount model is used. The dividend discount model (DDM) or the Gordon growth model (GGM) was named after Myron J Gordon in the 1960s. Under this model, dividends are used to calculate the intrinsic value of a stock as represented by the actual cash flows going to the shareholders, thus valuating the present value of these cash flows should give a value for how much the shares should be worth [8]. Based on the model, they are willing to buy, hold or sell the stock.

The DDM builds up an unequivocal expected return for stock trade. It appraises the intrinsic value of a stock that is expressed like present value of future dividends. In this way, the valuation of stocks depends on the net present value of future dividends [9]. Using DDM is more complex than it appears to be, because the investor will guarantee that the expected rate of return correspond to the risk involved. The shareholders are the residual owners of a corporation. Their return is less certain than the return to lenders or preferred stockholders. The main thing that the investors check if they need to utilize the DDM is the company that actually pays a dividend. Companies that pay steady and unsurprising dividends are those stable and matured companies in nature and well-developed industries. These companies are most frequently appropriate for this kind of valuation method.

The DDM has different tractable models: a) zero-growth model (no change in the earnings stream because the asset base and the rate of return on the assets never changes); b) constant growth model (dividends are trending upward at a constant growth rate); c) two-stage growth model (a period of fast growth followed by a period of constant growth); d) three-stage growth model (a period of fast growth followed by a period of diminishing followed by a period of constant growth); and e) the H-model (developed by Fuller and Chi-Cheng [10] has an

initial growth rate that is already high which then declines to a stable growth rate over time) [11].

There are some alternative valuation methods that investors or security analysts could choose in valuation of the company's common stocks like the discounted cash flow (DCF), relative valuation method or comparables method and abnormal earnings (AE) valuation model or residual income model. In DCF valuation, the objective is to find the value of the company's assets, given their cash flow, growth and risk characteristics.

In relative valuation or comparables method, on the other hand, the objective is to value assets, based upon how similar assets are currently priced in the market with the use of multiples/ratio methods such as price-to-earnings (P/E) ratio, price-to-book (P/B) ratio, price-to-sales (P/S) ratio and price-to-cash flow (P/CF) ratio. These choices will be driven largely by the characteristics of the company's asset being valued like the level of its earnings, its growth potential, the sources of earning growth, the stability of its leverage and its dividend policy. The AE valuation model, on the other side, is a method for determining the company's worth that is based on book value and abnormal earnings. It looks at whether management's decision causes a company to perform better or worse than anticipated. The model tells that investors should pay more than book value if earnings are higher than expected and less than book value if earnings are lower than expected. In other words, the investors or security analysts need to be more careful and knowledgeable in choosing different valuation methods. Most especially that these valuation methods have different inputs and assumptions to be included so that the outputs are factual.

Many investors and security analysts believe that choosing the constant growth DDM is still the simplest and most common model for valuating stocks in finance because the only cash flow that they receive from a company when they buy publicly traded stock is the dividend.

### Objectives of the Study

The main objective of this study is to test the reliability of constant growth DDM in the valuation of Philippine common stocks.

Specifically, this study aimed to:

1. Present a situation regarding the variables included in the study like dividends per share, earnings per share, return on equity and company's stock prices from 2012 to 2016;
2. Estimate the parameters needed in the constant growth DDM;
3. Estimate the predicted value of company's common stocks using the constant growth DDM; and
4. Test whether there is a significant difference between the actual stock price and the predicted stock price.

### Methodology

Figure 2 shows the framework on how to estimate the predicted value of Philippine company's common stocks using the constant growth DDM. First step is to compute the expected dividend growth rate ( $g$ ) which is used to compute the required rate of return ( $k$ ) and expected dividends per share next year ( $D_1$ ) of a certain company. The  $g$  must be equal to retention rate (one minus dividend payout ratio) multiplied by the return on equity. Next step is to estimate the required rate of return ( $k$ ) that is equal to dividend yield (expected dividends per share divided by the company's stock price) multiplied by the expected dividend growth rate. Also, the  $D_1$  of the selected companies must be computed that is equal to  $D_0$  (dividends per share of a current year) multiplied by one plus  $g$ . After estimating  $g$ ,  $k$ , and  $D_1$ , these parameters are needed in order to estimate the predicted value of a company's stock ( $P_0$ ) using the constant growth DDM. Finally, the reliability of constant growth DDM to predict the company's stock value is compared to the actual value of the company's stocks using the symmetric median absolute percentage error (sMdAPE) and then tested using a non-parametric test called Wilcoxon signed-rank test. This is done by finding the median difference between the actual and predicted prices whether the difference between the two are significant. All the variables mentioned are measured or tested in the estimation portion of this study.

### Estimation procedure

The predicted value of a company's common stocks is estimated annually from 2012 to 2016 using the constant growth DDM in eqn. (1) [12]:

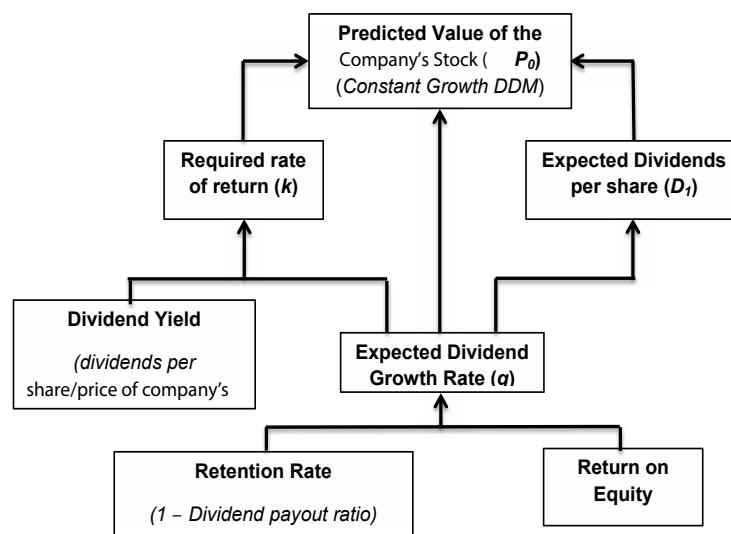


Figure 2: Framework of estimating the predicted value of a company's stock using the constant growth DDM.

$$P_{it} = \frac{D_{i,t+1}}{k_{it} - g_{it}} \quad (1)$$

$P_{it}$  = predicted value of a company's stock  $i$  at next year  $t$ .

$D_{i,t+1}$  = company's expected dividends per share  $i$  at year  $t+1$ .

$k_{it}$  = expected required rate of return of the company's stock  $i$  at current year  $t$  in perpetuity.

$g_{it}$  = expected dividend growth rate of a company's stock  $i$  at current year  $t$  in perpetuity.

In constant growth DDM, the parameter  $g_{it}$  must be computed first followed by the parameters  $k_{it}$  and  $D_{i,t+1}$ . The formula for  $g_{it}$  is:

$$g_{it} = (1 - \text{payout ratio}_{it}) * ROE_{it} \quad (2)$$

where:

$(1 - \text{Payout ratio}_{it})$  = also known as the retention rate, wherein the payout ratio is computed as dividends per share ( $DPS_{it}$ ) divided by the earnings per share ( $EPS_{it}$ ) of a company's stock  $i$  at current year  $t$ .

$ROE_{it}$  = Return on equity of a company's stock  $i$  at current year  $t$ .

The  $g_{it}$  is used in computing the company's required rate of return,  $k_{it}$ . The implied formula for  $k_{it}$  is:

$$k_{it} = \text{Dividend yield}_{it} + g_{it} \quad (3)$$

where:

$\text{Dividend yield}_{it}$  = dividends per share ( $D_{it}$ ) divided by the actual stock price per share ( $ASPS_{it}$ ) of a company's stock  $i$  at current year  $t$

On the other hand, the  $D_{i,t+1}$  is computed in this form:

$$D_{i,t+1} = D_{it}(1 + g_{it}) \quad (4)$$

where:

$D_{it}$  = dividends per share of a company's stock  $i$  at current year  $t$ .

In order to investigate the accuracy of constant growth DDM to predict the value of a company's stock from the actual value, the symmetric median absolute percentage error (sMAPE) is employed to measure the accuracy of predicting errors in this formula:

$$sMAPE = \text{median} (200 * |s_i|)$$

where,

$$s_i = \text{symmetric error where in, } \frac{|prediction error_i|}{(Actual_i + Predicted_i)}$$

$s_i$  = symmetric error wherein,

Finally, each of the predicted value of a company's stock obtained in Equation 1 is tested to the actual value or price of a company's stock annually by finding the median difference between the actual and predicted values whether the two are significant. The Wilcoxon signed-rank test is used as the appropriate test statistic.

Wilcoxon signed-rank test is applied when comparing two series or populations with paired observations. It is an alternative to a paired sample  $t$ -test in cases when data time series and the differences between observations are not normally distributed. It does not only incorporate the sign differences analysis, but also tests their magnitude. This process is done by considering the ranks of these differences.

Suppose that the data  $X_1, X_2, \dots, X_n$  are independent and identically distributed from some symmetric continuous distribution. Then,

the assumptions of Wilcoxon non-parametric test are [13,14]: a) independent of differences (i.e., changes in prices are mutually independent); b) identical distribution (the data are paired and come from the same population); c) continuity (the continuity assumption assures that ties are impossible, and is necessary for the point estimate and confidence interval); and d) symmetry.

In order to calculate the Wilcoxon signed-rank test statistic, the difference  $D$  is calculated for each pair of data ( $D = x_1 - x_2$ ). The second step involves the rank of differences absolute values. In the next step, the ranks of the positive and negative differences are summed. The formula for the Wilcoxon signed-rank test statistic  $Z$  is [15]:

where:

$$Z = \frac{W_s - \mu_s}{\sigma_s}$$

$W_s$  = smallest of absolute values of the sums.

$\mu_s$  = mean wherein,  $\frac{n(n+1)}{4}$ .

$\sigma_s$  = standard deviation wherein,  $\sqrt{\frac{n(n+1)(2n+1)}{24}}$ .

$n$  = number of pairs where difference is not zero.

The constant growth DDM qualifies as a reliable model in which it predicts common stock prices that are not significantly different (significantly the same) from the actual one [16]. The null hypothesis  $H_0: \mu_A - \mu_P = 0$  or the median difference between the populations is zero (have the same distribution) is rejected if  $p$ -value is less than 5% or 10% levels of significance or otherwise, accept the  $H_0$ . If  $H_0$  is rejected, therefore the constant growth DDM is not a good predictor of the common stock prices of these companies listed at the PSE. This means that constant growth DDM is not a reliable model on companies listed at the PSE to predict their stock prices. The computation for the constant growth DDM and its parameters, and the symmetric median absolute percentage error (sMdAPE), as well as, the graphical presentations are done using the Microsoft Excel. While, the descriptive statistics and the Wilcoxon signed-rank test are computed using the SPSS Version 16.

## Results and Discussion

### Situationer of the variables included among the PSE listed companies

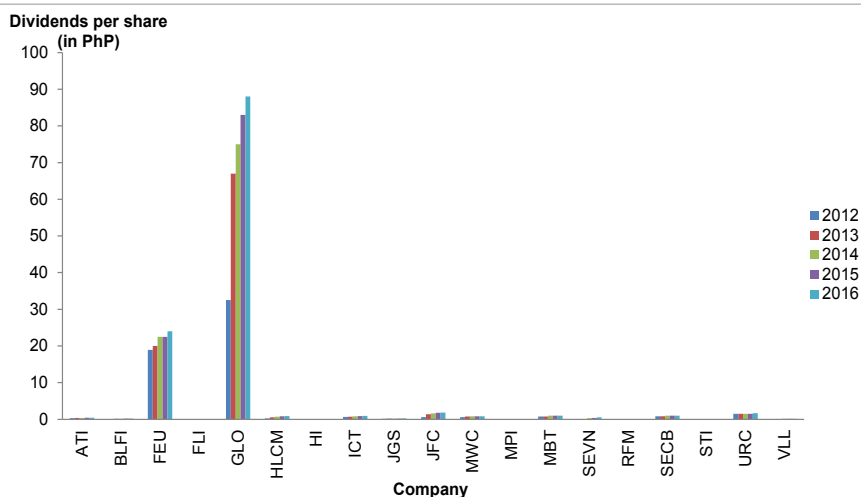
Out of 318 companies listed in PSE, about 272 are locally tradable common stocks. From 272, about 19 common stock companies are chosen based on the dividends that are constantly increasing from 2012 to 2016 as shown in Table 1 and Figure 3.

There are possible reasons why dividends per share of these companies increase yearly: 1) the increase of net profits gained by these companies; and 2) the shift of growth strategy made by these companies that leads to spend less of their earnings in seeking growth and expansion, leaving a larger share of profits available to their investors [17]. Higher net profits or share of profits gained by the companies like FEU and GLO means that these companies achieve higher dividends for every share received by their shareholders compared to those companies with lower dividends per share.

Figure 4 shows the earnings per share of selected common stocks listed companies in PSE from 2012 to 2016. Majority of the companies listed show increasing earnings per share which indicate that these companies either generating an increasing amount of earnings or

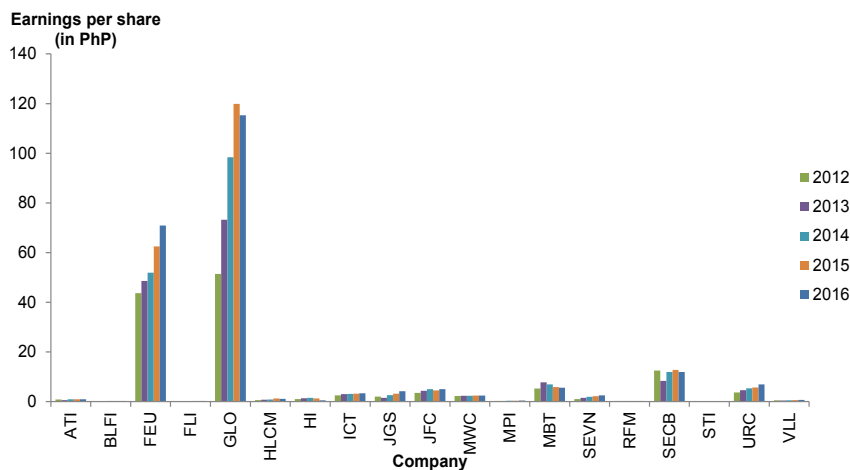
No.	Company	Quote
1	Asian Terminals, Inc.	ATI
2	BDO Leasing and Finance, Inc.	BLFI
3	Far Eastern University, Inc.	FEU
4	Filinvest Land, Inc.	FLI
5	Globe Telecom, Inc.	GLO
6	Holcim Philippines, Inc.	HLCM
7	House of Investments, Inc.	HI
8	International Container Terminal Services, Inc.	ICT
9	JG Summit Holdings, Inc.	JGS
10	Jollibee Foods Corporation	JFC
11	Manila Water Company, Inc.	MWC
12	Metro Pacific Investments Corporation	MPI
13	Metropolitan Bank and Trust Company	MBT
14	Philippine Seven Corporation	SEVN
15	RFM Corporation	RFM
16	Security Bank Corporation	SECB
17	STI Education Systems Holdings, Inc.	STI
18	Universal Robina Corporation	URC
19	Vista Land and Lifescapes, Inc.	VLL

Table 1: Selected common stock listed companies in PSE.



Source: Morningstar – Independent Investment Research Database.

Figure 3: Dividends per share of selected common stock listed companies in PSE, 2012-2016.



Source: Morningstar – Independent Investment Research Database.

Figure 4: Earnings per share of selected common stock listed companies in PSE, 2012-2016.

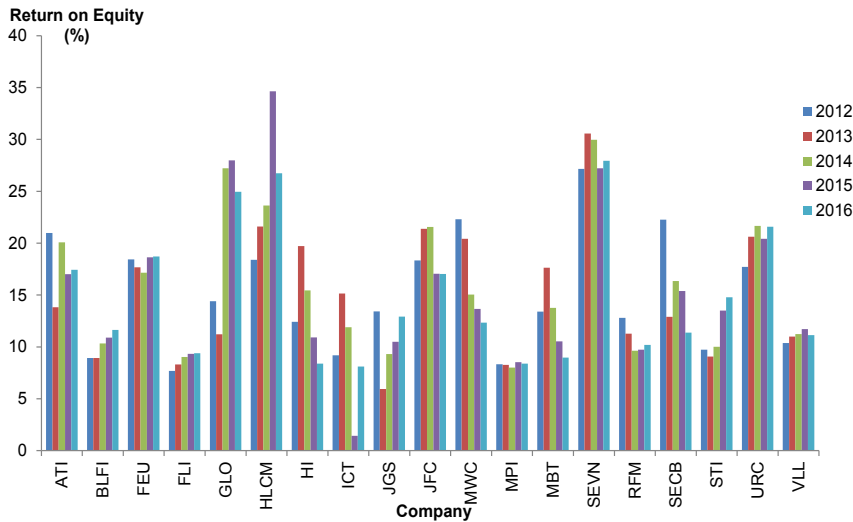


decreasing the number of shares by buying back its shares. Those companies with higher earnings per share like FEU, GLO and SECB are capable of generating a significant dividend for their investors, or it may plow the funds back into its business for more growth that are potentially worthwhile investment compared to those companies with lower earnings per share.

Figure 5 shows the return on equity of selected common stock listed companies in PSE from 2012 to 2016. Those companies with higher return on equity like ATI (2012 and 2014); GLO (2014 to 2016); HLCM (2013 to 2016); JFC (2013 to 2014); MWC (2012 to 2013); SEVN (2012 to 2016); SECB (2012); and URC (2013 to 2016) have the ability to generate profit without much capital needs. Increasing the debt capital relative to equity capital, more sales the company produces relative to its assets, distributing idle cash to shareholders and lowering the taxes are the number of ways why the abovementioned companies increase

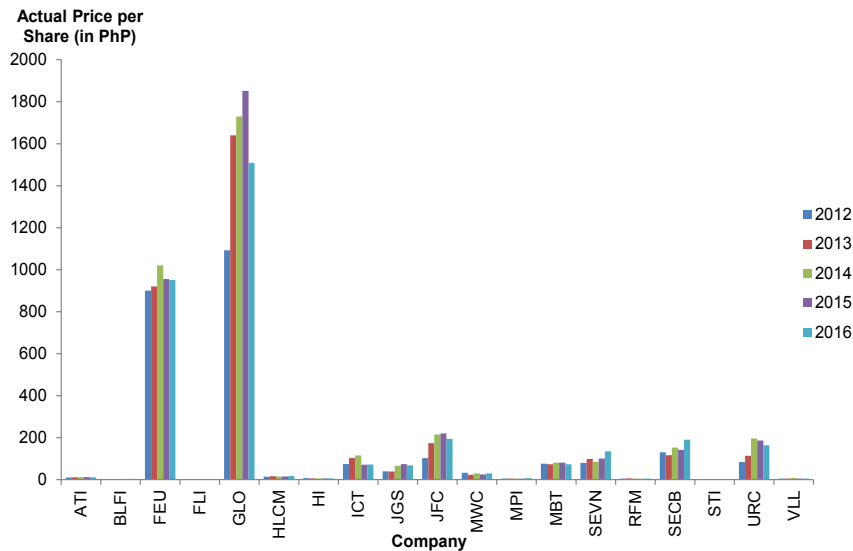
their return on equity. In other words, those companies with higher return on equity indicate that these companies are spending wisely and are likely profitable compared to those companies with lower return on equity [18].

Figure 6 shows the price per share of selected common stock listed companies in PSE from 2012 to 2016. Price per share can be calculated by dividing the market capitalization to the number of shares outstanding. Companies with higher price per share like FEU and GLO do not mean high market capitalization with few numbers of outstanding shares. For example, GLO has a higher market capitalization of 151,014,755.00 pesos with the most number of outstanding shares of 100,055 which give a higher price per share of 1,509 pesos (as of Dec. 2016). Compared to FEU that has a lower market capitalization of 494,000 pesos with a very few number of outstanding shares of 520 which give a higher price per share of 950 pesos (as of Dec. 2016). In other words, higher price



Source: Morningstar – Independent Investment Research Database.

Figure 5: Return on equity of selected common stock listed companies in PSE, 2012-2016.



Source: Morningstar – Independent Investment Research Database.

Figure 6: Actual price per share of selected common stock listed companies in PSE, 2012-2016.

per share using the formula does not mean a lot that FEU and GLO are better companies. The primary factor that causes higher share price is the increase in company's earnings, higher demand for shares due to a new or highly anticipated product that will be going to sale in the near future, short term or higher dividend declaration and buyback shares; compared to those companies with lower price per share from 2012 to 2016 like BLFI, FLI, HI, MPI, RFM, STI and VLL.

### Estimation of the parameters

Table 2 shows the estimated parameters of selected common stock listed companies in PSE. Results revealed that the expected dividends per share among 19 selected companies are constantly growing from 2013 to 2017 because the estimation is based on the current year dividends per share and the average annual dividend growth rate from 2012 to 2016. Moreover, SEVN got the highest dividend growth rate with 21.74%; followed by URC, FEU, STI, JGS, JFC and SECB which are greater than 10%. A higher dividend growth rate suggests higher retention rate and return on equity compared to those companies with lower dividend growth rate like ATI, VLL, MWC, FLI, MBT, HI, MPI, RFM, GLO, ICT, HLCM and BLFI which are lower than 10%. On the other hand, SEVN got the highest required rate of return with 22.15%; followed by URC, FEU, STI, ATI, JGS, GLO, VLL, JFC, MWC, SECB, FLI and HLCM which are greater than 10%. A higher required rate of return suggests higher dividend yield and dividend growth rate compared to those companies with lower required rate of return like MBT, BLFI, HI, RFM, MPI and ICT which are lower than 10%.

### Difference testing between the actual value and predicted value of PSE listed companies

Table 3 shows the difference testing between the actual value and predicted value of selected common stock listed companies in PSE. Results showed that BLFI, RFM, SECB, STI and VLL having a symmetric median absolute percentage error (sMdAPE) greater than 30%. This means that the error to predict the common stock prices of these companies is greater than 30%. Moreover, majority of the companies are having a sMdAPE less than 30% which is an indication that the error to predict the common stock values of the companies

is less than 30%. This means that the accuracy of the constant growth DDM to predict common stock values versus the actual values is more than 70%.

Finally, this study used the Wilcoxon signed-ranked test to test whether there is a significant median difference between the actual and predicted values of a company's stock (in *italics* font) as showed in Table 3. Results revealed that SECB having a *p*-value less than 5% level of significance, and FLI, GLO and RFM having *p*-values less than 10% level of significance.

This means that these results have to accept the null hypothesis ( $H_0$ ) that the predicted values are significantly different from the actual values (the predicted values are statistically not the same with the actual values). As a result, the constant growth DDM is not a reliable model for SECB, FLI, GLO and RFM. Based on the theory, constant growth DDM assumed that prices are determined by the expected dividends per share. Since the results are contrary, it implies that the prices of common stocks do not depend on dividends as observe by the variations of the actual prices that are not coincided with the expected dividends per share of SECB, FLI, GLO and RFM from 2012 to 2016. Moreover, the variations of the actual prices of SECB, FLI, GLO and RFM are connected with the earnings per share. According to Elton and Grubber [19], the stock price movements are associated with earnings changes which will lead to price adjustments.

On the other hand, majority of the companies having *p*-values that are greater than 5% and 10% levels of significance. This means that the results failed to reject the null hypothesis ( $H_0$ ) that the predicted values are not significantly different from the actual values (the predicted values are statistically the same with the actual values). It only means that the constant growth DDM is a reliable model to predict the common stock prices among the 15 companies listed in the Philippine Stock Exchange. The results are jibed with the theory and the results conducted by Mugosa and Popovic [15], Ivanovski et al. [20], and Bujang [21] that using the dividends per share can predict the common stock prices using the constant growth DDM. Since dividends are used to calculate the actual value of a stock using the constant growth DDM,

No.	Company	Expected dividends per share (in PhP)					Dividend Growth Rate%	Required Rate of Return (%)
		2013	2014	2015	2016	2017		
1	ATI	0.33	0.39	0.39	0.45	0.45	9.83	13.72
2	BLFI	0.05	0.16	0.16	0.18	0.21	3.33	8.6
3	FEU	21.01	22.2	24.98	24.42	26.64	12.38	14.91
4	FLI	0.02	0.03	0.03	0.04	0.04	7.69	10.31
5	GLO	34.27	70.65	79.09	87.52	92.8	5.9	11.74
6	HLCM	0.27	0.59	0.75	0.88	0.93	4.79	10.07
7	HI	0.06	0.07	0.07	0.07	0.07	7.35	8.52
8	ICT	0.73	0.75	0.91	0.96	0.97	5.89	7.15
9	JGS	0.18	0.2	0.22	0.24	0.27	12.14	12.51
10	JFC	0.66	1.54	1.85	2	2.1	10.68	11.64
11	MWC	0.66	0.85	0.9	0.91	0.93	8.13	11
12	MPI	0.02	0.04	0.05	0.07	0.1	6.4	7.75
13	MBT	0.83	0.83	1.08	1.11	1.11	7.37	8.75
14	SEVN	0.1	0.12	0.37	0.5	0.69	21.74	22.15
15	RFM	0.05	0.06	0.08	0.08	0.12	6.19	8.34
16	SECB	0.95	0.95	1.14	1.14	1.14	10.43	10.95
17	STI	0.01	0.02	0.02	0.02	0.02	12.33	14.39
18	URC	1.71	1.71	1.71	1.71	1.89	16.45	17.46
19	VLL	0.09	0.11	0.13	0.15	0.16	8.68	11.71

Table 2: Estimated parameters of selected common stock listed companies in PSE.

No.	Company	sMdAPE(%)	Wilcoxon signed-rank test
1	ATI	10.28 <sup>ns</sup>	0.225
2	BLFI	30.92 <sup>ns</sup>	0.5
3	FEU	4.85 <sup>ns</sup>	0.686
4	FLI	13.99*	0.08
5	GLO	22.02*	0.08
6	HLCM	20.25 <sup>ns</sup>	0.345
7	HI	6.89 <sup>ns</sup>	0.686
8	ICT	24.48 <sup>ns</sup>	0.225
9	JGS	15.33 <sup>ns</sup>	0.225
10	JFC	9.20 <sup>ns</sup>	0.345
11	MWC	21.81 <sup>ns</sup>	0.345
12	MPI	12.89 <sup>ns</sup>	0.225
13	MBT	7.20 <sup>ns</sup>	0.225
14	SEVN	27.31 <sup>ns</sup>	0.686
15	RFM	36.28*	0.08
16	SECB	36.60**	0.043
17	STI	30.46 <sup>ns</sup>	0.345
18	URC	21.75 <sup>ns</sup>	0.225
19	VLL	34.25 <sup>ns</sup>	0.138

\*significant at 10% level; \*\*significant at 5% level; nsnot significant at 5% and 10% levels

**Table 3:** Test for difference between the actual and predicted values of selected common stock listed companies in PSE.

valuating the present value of these dividends should give a value for how much the shares should be worth. Based on the model, investors are willing to buy, hold or sell the stock.

## Summary, Conclusions, Recommendations and Areas for Further Research

### Summary and conclusions

This paper tested the reliability of constant growth DDM in valuation of Philippine common stocks. The study used secondary data on dividends per share, earnings per share, return on equity and actual common stock prices of the selected common stock listed companies in PSE annually from 1972 to 2008. About 19 common stock listed companies were selected based on their dividends per share that are constantly increasing annually. Situation of the variables included like dividends per share, earnings per share, return on equity and actual price per share of the companies were checked. Furthermore, this study estimated the parameters like the expected dividends per share, dividend growth rate and required rate of return to predict the common stock values among the selected common stock listed companies in PSE using the constant growth DDM. The accuracy of the predicted values to the actual values was checked using the symmetric median absolute percentage error (sMdAPE). Finally, the median differences between predicted and actual values were tested using the Wilcoxon signed-rank test in order to check the reliability of constant growth DDM.

The following were drawn from the results of the study:

1. The expected dividends per share next year among 19 selected companies are constantly increasing from 2013 to 2017. The company with the highest dividend growth rate was SEVN with 21.74%; followed by URC, FEU, STI, JGS, JFC and SECB which were greater than 10%. Also, SEVN got the highest required rate of return with 22.15%; followed by URC, FEU, STI, ATI, JGS, GLO, VLL, JFC, MWC, SECB, FLI and HLCM which were greater than 10%.
2. Using the symmetric median absolute percentage error

(sMdAPE), the constant growth DDM to predict stock values for BLFI, RFM, SECB, STI and VLL are less accurate, compared to those companies having a sMdAPE less than 30%.

3. The predicted values of SECB, FLI, GLO and RFM were significantly different to the actual values in which the constant growth DDM was not a reliable model. The results are contrary with the theory and implied that the prices of common stocks do not depend on dividends. Also, the stock price movements are associated with earnings changes which will lead to price adjustments.

4. Those 15 companies had no statistical median difference between the predicted values and the actual values. The results are jibed with the theory and the results conducted by Mugosa and Popovic [15], Ivanovski et al. [20], and Bujang [21] that using the dividends per share can predict the common stock prices using the constant growth DDM. Therefore, the constant growth DDM was a reliable model to predict the common stock prices among those 15 companies listed in the Philippine Stock Exchange.

### Recommendations

Declaration of dividends is an important obligation of a company's board of directors. Returning excess cash to the shareholders is a popular move from the investor's perspectives because paying dividends is an indication of a company's financial strength and confidence in the future.

The following recommendations are suggested based on the findings of the study:

1. The constant growth DDM is only applicable to those companies who declare stable and predictable dividends; it is recommended that those non-paying dividend companies or companies who declare unpredictable dividends must adopt or strictly follow the dividend policy of the Philippines since dividends are the only cash flow that the investors received from a company and that will be used in valuating stocks.
2. In order for investors to make the best investment decisions regarding those 15 common stocks declared stable and predictable dividends; the constant growth DDM should be used in order to obtain a descriptive forecast of investment returns for those stocks.

### Areas for further research

The suggested areas for further study are the following:

1. Use other tractable methods in DDM such as two-stage, three-stage and H-models for those common stock listed companies who declare unstable or unpredictable dividends.
2. Use other valuation methods such as Discounted Cash Flow (DCF) and Abnormal Earnings (AE) for non-paying dividend companies.

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