On Stock Dividends, Share Prices and Shareholder Wealth

By *Nelson H. Salita*

The author examined stock dividend declarations and their impact on stock prices on and around the ex-dates for six Philippine companies during the 1988-1992 period. The study finds that the market price does not adjust perfectly and that stockholder gains from stock dividends are possible.

The impact of stock dividends on share prices and shareholder wealth has been the subject of recurring research in academic circles in the U.S. and of on-going arguments in finance literature. Companies which pay dividends have occasionally used stock dividends either as a replacement for, or as a supplement to, the payment of cash dividends. A stock dividend is simply a disbursement of additional shares of stock to the firm's shareholders - for example, in a 10% stock dividend, investors would receive one share of stock for every 10 shares held - and, for the company, simply involves a bookkeeping transfer from retained earnings to the capital stock account. Firms use stock dividends as a means of giving owners something without having to use cash. For one, stock dividends project an image of growth and create a favorable impression to shareholders since such gestures signal good performance and continued profitability. Yet another, when a firm is growing rapidly stock dividends are used to conserve cash for liquidity requirements and to meet its needs for internal financing to support its growth.

For the investor, what is the value of stock dividends? It has been argued that shareholders receive nothing of value when stock dividends are paid. The argument goes that the per-share value of the shareholder's stock will decrease in proportion to the dividend in such a way that the market value of his total holdings will remain unchanged. Thus, theoretically, stock dividends should not change the wealth of shareholders.

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However, an examination of share prices after stock dividends are declared reveal that actual prices may differ from the theoretical full-price adjustment, and therefore suggests the possibility of some gains to shareholders. The numerical example below helps clarify this argument. Let's take the case of SMC with a 15% stock dividend on (ex-date) June 24, 1988:

	Before stock dividend	After 15% stock dividend At Theoretical Price (perfect adjustment)	At Actual Price
Investor shares (assume)	1,000 sh.	1,150 sh.	1,150 sh.
Price per share	₱148.00	₱128.70	₱132.00
Total market value of stock holdings	₱148,000	₱148,000	₱151,800
Change in value	-	0	₱ 3,800

The foregoing example illustrates how total market value of stockholdings of an investor could remain the same before and after the 15% stock dividends because of a proportionate decrease in per-share value (₱148/1.15 = ₱128.6956). Using the actual ex-date price of ₱132, however, the market value of the stockholdings increases to ₱151,800 or a gain of ₱3,800.

The empirical question to be examined in this study is

therefore, do share prices generally decrease proportionately (that is, adjust perfectly) after stock dividends are paid? If not, are stockholders better-off or worse-off after stock dividends? This paper intends to provide some answers to these questions by using Philippine data.

THE EMPIRICAL STUDY

A. *Brief Review of Literature*

Much of the empirical researches on stock dividend declarations and the market price of the stock were undertaken in the U.S. The effect of stock dividends and stock splits on shareholder wealth have been studied extensively. Barker (1958) and Fama (1969) have shown empirically that the market price of a company's stock falls proportionately after stock dividends. And this effect holds unless the stock dividend is accompanied by an increase in cash dividends.

Foster and Vickrey (1978) have investigated the information content or signalling effect of stock dividend announcements. They contend that the market's reaction to such information occurs no later than the declaration date and produces positive unexpected returns, but the market is not conditioned to react positively to stock dividends of any size on the ex-date. A further study by Woolridge (1983) using daily stock data suggested a less-than-full stock price adjustment on the ex-date and such stock dividend declaration increases the value of stockholdings. He argued that these findings may be indicative of market imperfections, market inefficiency, or both. Other researches studied the signalling effect of stock dividends and stock splits. In particular, McNichols and Dravid (1990) argued that firms signal their private information about future earnings by their choice of the split factor, and that investors revise their beliefs about firm value accordingly.

B. *Data*

Twelve stock dividend declarations involving six Philippine companies were identified, namely: PNB, PLDT, Ayala Corp., First Phil. Holdings, Anscor, and SMC. These six companies were chosen from the roster of firms listed in the Manila Stock Exchange belonging to the commercial-industrial (C-I) sector and which declared stock dividends during the period 1988 to 1992. The C-I stocks were chosen since they exhibit a relatively less volatile behavior as compared to the mining/oil sector.

Stock price data from January 1988 to July 1992 was collected from daily listings of the Manila Stock Exchange (MSE) as published in the Manila Business Bulletin newspaper. Ex-dividend dates for these six companies were taken from publications of the MSE Monthly Review and Business World newspaper. Likewise, daily data on industry sector indices, i.e., C-I average, was collected to provide a good examination of the companies' stock price movements in relation to the market. To single out daily stock data, the period 40 trading days before and 40 trading days after the ex-dividend date was chosen. This would provide a sufficient sample size to use in formulating an expectations model and for prediction as discussed in the section that follows.

C. *Methodology*

The impact of stock dividends was examined by, first, formulating an expectations model to determine the aggregate market reaction to the stock dividend and second, by analyzing stock returns on and around the ex-dividend date to gauge the extent of price adjustment. (At the ex-date, buyers will no longer be entitled to the stock dividend, and hence, most if not all of the price adjustment should occur on this date.)

For the first stage, we recall from finance literature that stock returns are influenced by (1) factors common to all stocks, i.e., those affecting all stocks such as the general economic activity, booms and recessions, inflation, interest rates, politics; and (2) factors unique to the firm, e.g., specific management policies, target market and competitive strategy, profitability and financial performance. With this relationship we express the actual stock return as:

$$r = E(r) + e$$

where r = actual stock return
$E(r)$ = expected return of the stock, brought by factors common to all stocks
e = residual (error term), which incorporates the effect of factors specific to the firm and random price changes

The actual return of a stock, r, on a particular day, t, is defined as:

$$r_t = \frac{(P_t - P_{t-1}) + D_t}{P_{t-1}}$$

where P_t = the closing price of the stock on day, t.
D_t = the cash dividend paid, if any, by the stock on day t.
P_{t-1} = the closing price of the stock on the previous day, t-1.

The expected return of the stock, E(r), is defined as :

$$E(r)_t = a + b\, r_{Mt}$$

where a and b = least squares regression coefficients
r_{Mt} = the market return on day, t, as approximated by the return on the industry sector index (i.e., return on C-I average)

The C-I average, which reflects the trading activities of major stocks in this industry sector, was used to capture the effect of factors common to all stocks. The subtraction of E(r) from r yields the residual for the stock on a particular day, as denoted by the error term, e. Since the upswings and downturns in the market which affect stock prices are already reflected in E(r), then the residual will capture the effect of specific company actions, e.g., dividends, on the stock returns and hence on the actual stock price.

An expectations model was developed for each of the 12 stock dividend declarations to estimate the expected return of the stock, E(r). All the models excluded observations from the seven-day period surrounding and including the ex-dividend date, i.e., the period starting 3 trading days before the ex-dividend date up to 3 trading days after. This was done to initially establish the trends in the market and to isolate the effects of stock dividends. The use of a 7-day period rather than just the ex-date allows for the possibility that the market reaction to the stock dividend (i.e., price adjustments) is staggered around the ex-date. For this seven-day period, the expected returns E(r) of each stock were then estimated and these expected values were subtracted from their respective actual returns, r, in order to get the residuals, e.

For the second stage, the stock returns were analyzed on and around the ex-date. To determine whether perfect or less-than-full price adjustment occurs, the residuals at the ex-date were pooled across companies and tested for significance. Our null hypothesis is that the mean residuals at the ex-date would be the same as the population mean of residuals, where the latter represents random price changes or factors other than the stock dividend. The alternative hypothesis is that stock dividends affect share prices on the ex-date (i.e., a less-than-full price adjustment) and hence, the mean residual at the ex-date should be significantly different from the population mean.

The possibility that the price adjustment is staggered around the ex-date was also explored by running similar tests during the period 3 trading days before and after the ex-date.

D. *Statistical Testing and Empirical Results*

Using the method of least squares, the regression coefficients, a and b, were obtained for each firm by regressing daily stock returns (r_t) on the market return (r_{Mt}). The utility of the models were tested and then these coefficients were used to estimate E(r) around the ex-dividend date. Upon comparison with actual stock returns, r, the resulting residuals, e, were calculated. The regression estimates and residual values are summarized in Tables 1 and 2.

Table 1 shows that for six out of the twelve stock declarations analyzed, a fairly strong linear relationship was observed between the individual stock returns and market returns; while four others displayed a moderate to weak linear fit. In particular, PNB (1990), PLDT, and Ayala (1990) exhibited strong linear relationships with correlation R = 0.683, 0.773, and 0.929 respectively. The a-coefficients obtained for all the stocks were near zero which suggests that any difference between the individual stock return and the market returns is due principally to the residual (i.e., $r_t - br_{Mt} = e_t$).

In Table 2 the behavior of the daily residuals was examined on and around the ex-dividend date. Should the market react to the stock dividends, then larger magnitudes of residuals should be observed around the ex-date.

Note that in the stocks analyzed, the residuals generally follow this pattern. That is, the observed behavior of the residuals show increasing values at t = -2 to -1, and onwards to large positive values at t = 0 (ex-date). For instance, ANSCor (1988), PLDT, and PNB (1992) exhibited this behavior. But how significant are these residuals? A closer

examination of the residual pattern was done to determine: (1) the extent of the ex-date effects of stock dividends, and (2) the possibility of gradual price adjustments before or after the ex-date.

1. Ex-Date Effects of Stock Dividends

Nine out of the twelve stock dividend declarations analyzed show positive residuals at t = 0 (Table 2). This indicates a less-than-full price adjustment at the ex-date. The residual returns range from about one percent to a high of 10 percent at the ex-date as in the case of Ayala (1989).

In two instances (PNB 1990 and 1991), however, large negative values of residuals were observed at t = 0. This indicates more than full price adjustment. This may indicate substantial selling of stocks on the ex-date although after t = 0, the stocks rebounded back to show increasing residuals. It is possible that the fact that PNB was a relatively new stock in the market may have something to do with this atypical pattern.

The T-test was performed to determine the significance of the residuals at t = 0. Table 3 summarizes the results of the test. The T-value obtained indicates that at the ex-date the mean residual is significantly greater than the population mean, i.e., the residual returns observed were due not to random price changes alone. Hence we reject the null hypothesis. This means that investors were generally better-off with stock dividends since actual share prices did not adjust perfectly to the theoretical price at the ex-date.

2. Stock Dividend Effects Around the Ex-Date

The price adjustments occurring around the ex-date were also examined. The residuals were again pooled across companies, this time for each of the 3 days before and after the ex-date. As shown in Table 4, on average, positive residuals were experienced on t = -2 and -1. This indicates favorable market reaction to the stock dividends. Note that only at t = -1 was the mean residual statistically significant. Beyond the ex-date, the results are not as conclusive. Overall, the results indicate that most of the reaction occurs at the ex-date and just prior to it.

The reader is invited to note some information releases surrounding the ex-date for certain companies in the sample (Table 2). Literature suggest that these may have positive effects on the stock price around the ex-date.

Table 1. REGRESSION COEFFICIENTS OF EXPECTATIONS MODEL

	PNB			PLDT	AYALA CORP		
Expectation Model	20% s.d. 12/20/90	15% s.d. 7/9/91	5% s.d. 6/8/92	15% s.d. 6/8/92	20% s.d. 5/3/88	30% s.d. 5/2/89	20% s.d. 5/28/90
a	0.00329	0.00164	-0.00236	0.00158	-0.00042	0.00287	0.00080
b	0.86147	0.55404	0.96676	0.87943	0.38805	1.28759	1.19532
R	0.68276	0.60321	0.58756	0.77262	0.25983	0.64183	0.92886

	ANSCOR		FPH	SMC	
Expectation Model	50% s.d. 7/13/88	25% s.d. 6/8/89	20% s.d. 2/10/92	15% s.d. 6/24/88	100%, 2:1 split 7/10/89
a	-0.00098	0.00715	-0.00087	0.00175	-0.00015
b	0.93060	0.00195	0.55972	0.09960	0.17948
R	0.30858	0.00228	0.39307	0.16369	0.28868

Note: Correlation coefficient, R, measures the linear relationship between variables. R values are always between -1 and +1, i.e., perfect negative and perfect positive relationship respectively. The closer R is to +1 or -1, the stronger the linear relationship between the variables.

Table 2. RESIDUAL VALUES AND NEWS ANNOUNCEMENT

Event Day	PNB 20% s.d. 12/20/90	PNB 15% s.d. 7/9/91	PNB 5% s.d. 6/8/92	PLDT 15% s.d. 6/8/92	AYALA CORP 20% s.d. 5/3/88	AYALA CORP 30% s.d. 5/2/89	AYALA CORP 20% s.d. 5/28/90
14	-0.02330	-0.00511	0.00580	-0.01374	-0.00110	0.01162	-0.00140
13	-0.01198	-0.00614	0.00063	0.01280	0.00350	-0.00686	-0.00751
12	0.04156	-0.01496	-0.00348	-0.00517	0.02124	-0.00704	-0.00725
11	-0.03640	-0.01269	-0.00153	0.01306	0.03645	0.01128	0.01002
10	0.00998	0.02229	-0.02908	0.01600	0.00042	-0.00252	-0.00095
9	-0.00913	-0.00164	-0.01058	0.01094	-0.01913	0.02195	0.01232
8	0.01488	0.00180	-0.00010	0.00680	-0.00742	0.03466	-0.01397
7	-0.01736	-0.01667	0.02239	0.01330	0.01941	-0.01872	0.00376
6	0.01291	-0.00413	-0.00337	-0.00351	-0.00233	-0.00287	0.00661
5	-0.01988	0.01109	0.01132	-0.00180	0.00377	0.01957	0.02941
4	0.01010	-0.00494	0.01565	-0.01626	-0.00121	0.01510	0.00490
3	-0.02213	-0.00172	0.01042	-0.00159	-0.00304	-0.00735	0.00051
2	-0.01670	0.00274	-0.01828	0.10011	0.00149	0.04595	-0.03690
1	0.00507	0.00669	0.07106	0.02149	-0.00024	-0.02837	0.04498
0	-0.08865	-0.03986	0.05945	0.07180	0.06629	0.09681	-0.00978
+1	-0.00163	-0.01715	0.02992	-0.13390	-0.03747	-0.01453	-0.00382
+2	0.00956	-0.02708	0.00060	0.00504	0.00079	-0.01260	-0.03927
+3	0.00043	-0.01373	-0.00830	-0.03386	0.00910	-0.02082	0.05689
+4	-0.00079	0.01913	0.00236	-0.00159	-0.00121	0.10565	-0.00358
+5	-0.00922	0.00564	0.00973	-0.01589	-0.00104	0.02002	-0.00835
+6	-0.09898	-0.00095	-0.01528	-0.02960	-0.00004	0.02269	0.00408
+7	0.05547	-0.01280	0.00278	-0.01201	0.00175	-0.05038	0.02540
+8	0.02481	0.02821	0.01258	-0.02093	0.01449	-0.00107	-0.03667
+9	0.00856	-0.00164	0.00311	-0.03755	0.00318	0.01368	0.00717
+10	-0.00387	-0.01721	0.00236	-0.00158	0.01373	-0.01049	0.02374
+11	-0.00073	-0.01380	-0.02296	0.00055	0.00021	-0.02461	-0.00080
+12	-0.01168	-0.01479	0.00236	-0.00158	-0.01486	-0.01726	0.00728
+13	0.03086	-0.00636	-0.04988	0.01372	0.01176	0.01232	-0.00914
+14	-0.00558	-0.00346	-0.04020	0.03359	-0.01065	-0.02806	0.00265

Event Date	ANSCOR 50% s.d. 7/13/88	ANSCOR 25% s.d. 6/8/89	FPH 20% s.d. 2/10/92	SMC 15% s.d. 6/24/88	SMC 100%, 2:1 split 7/10/89
14	-0.00551	-0.00713	0.01306	0.01090	-0.00404
13	-0.01649	-0.00708	0.04805	-0.00300	-0.00376
12	0.00098	-0.03069	0.03575	-0.04921	0.02860
11	-0.02889	-0.01920	-0.00826	0.04133	0.00999
10	0.00098	-0.03151	-0.01751	-0.01452	-0.01443
9	-0.00485	-0.03213	0.00724	0.00221	-0.00942
8	-0.00916	-0.01993	0.00677	0.00462	-0.00643
7	0.02963	-0.00721	-0.00753	-0.00307	0.00104
6	0.08318	0.05774	-0.01186	-0.00186	-0.00964
5	-0.01249	0.00504	-0.00499	0.01164	0.03466
4	-0.01234	-0.00717	0.00341	0.00438	-0.01329
3	-0.00925	-0.01918	-0.00087	0.00463	0.00904
2	0.00382	-0.03152	-0.03151	-0.00251	0.05773
1	0.01327	0.01785	-0.00045	-0.00937	-0.00946
0	0.05483	0.01412	0.00295	0.02348	0.05111
+1	-0.01720	-0.00715	0.00969	-0.00144	0.02313
+2	-0.00403	-0.00715	-0.00087	-0.00849	-0.00038
+3	-0.01824	-0.02207	-0.00541	-0.00175	0.00516
+4	-0.01381	-0.02230	-0.00709	0.02052	0.02631
+5	-0.00263	-0.02253	-0.01997	0.01209	0.04804
+6	0.01974	-0.00717	-0.01524	0.01301	0.00707
+7	-0.00693	-0.00718	0.01627	0.02596	-0.00191
+8	-0.00662	-0.00715	-0.02958	-0.00896	0.03016
+9	-0.00900	-0.00719	0.02530	-0.01601	0.02930
+10	-0.01694	0.00848	-0.03164	-0.00867	0.05357
+11	0.02422	-0.02254	0.00269	-0.00145	0.00043
+12	0.00169	0.00849	0.01158	-0.00907	-0.02950
+13	-0.00635	-0.00715	-0.01993	-0.00216	-0.03535
+14	-0.00606	-0.02252	0.01048	0.01285	0.00015

News & Reported Events: (from Day t= -3 to +3)
PNB (1990) — P0.20 cash dividend (Ex-date 12/20); debt relief to calamity-stricken areas and dislocated businesses (12/17)
PNB (1991) — reported high profits (7/10); continue expanded privatization program (7/11)
PLDT (1992) — P1.60 cash dividend (Ex-date 6/8)
SMC (1988) — P0.75 cash dividend (Ex-date 6/23)

Table 3. EX-DATE EFFECTS OF STOCK DIVIDENDS

Residual Analysis:

(pooled residuals across companies)

Mean Residuals at Ex-date	=	0.025214
Population Mean of Residuals*	=	-0.000401
T-statistic	=	1.67824
Critical value at 0.10 level of significance	=	1.36300

*Based on residuals from t= -14 to +14, excluding ex-date, for all companies.

Table 4. STOCK DIVIDEND EFFECTS AROUND THE EX-DATE

Residual Analysis:

(pooled residuals across companies)

	At t = -3	t = -2	t = -1	t = +1	t = +2	t = +3
Mean Residuals =	-0.00338	0.00620	0.01104	-0.01430	-0.00699	-0.00438
Population Mean of Residuals* =	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
T-statistic =	-1.186	0.515	1.450	-1.185	-1.756	-0.665
Critical value at 0.10 level of significance =	1.363	1.363	1.363	1.363	1.363	1.363

*Based on residuals from t= -14 to -4 and +4 to +14 for all companies.

SUMMARY AND CONCLUSION

Highlights of the empirical results are as follows:

1. The price of the company's stock falls after stock dividends, although not perfectly, i.e., a less-than-full stock price adjustment on the ex-dividend date. As observed, the actual prices at the ex-date are significantly above the expected prices for the entire sample most of the time. Consequently, the stock dividends generally increased the value of investor's stockholdings.

2. Previous studies have suggested an explanation to this phenomenon: stock dividend information changes investor expectations concerning future dividend and earnings level. The market reacts to stock dividends since this may indicate that the firm is retaining and reinvesting its earnings for future growth, and it signals possible future cash dividend increases.

3. For some companies, newspapers were reporting (around the ex-date) favorable corporate developments, such as cash dividends, the company's plans for future growth as well as other announcements. It is possible that these companies timed the release of the announcements with stock dividends to improve market reaction. In the case of PNB, however, this did not appear to produce the desired results.

In sum, the study findings provide evidence to support the argument that stock dividends affect share prices in a less-than-full price adjustment at the ex-dividend date, thereby increasing the market value of an investor's shareholdings. These findings could be validated by future studies using larger data bases.

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