

EARNINGS, DIVIDENDS AND CASH FLOW VOLATILITY: A SOUTH AFRICAN PERSPECTIVE

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Abstract

This study investigates the relationship between share prices and the volatilities of earnings per share, dividends per share and cash flow per share. The relationships between the three measures and share prices are also investigated. The results indicate that the volatilities of earnings and dividends have a significant relationship with share prices, while the volatility of cash flows does not have a statistically significant relationship. The results also indicate a significant positive relationship between share prices and earnings per share, dividends per share and cash flow per share.

Keywords: earnings smoothing; dividend volatility; cash flow volatility

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1. INTRODUCTION

A firm's share price is influenced by numerous factors. These include, amongst others, external factors (macro-economic factors) as well as internal factors (micro-economic factors). When making an investment decision, it is therefore important that investors should attempt to incorporate these factors in their decision-making process. Although investors may realise the importance of a detailed analysis of various factors, a large number of them predominantly focus on a firm's earnings, its cash flow position, and the dividends distributed to its shareholders when making their investment decisions. Very often this narrow focus is the result of the easy access that investors have to these firm-specific variables through published financial statements.

As a result of investors' focus on these firm-specific factors, managers may act in such a way to ensure that these variables are maximised. This could result in the management of earnings per share (EPS) figures, where managers are tempted to manage EPS in such a way that smoother EPS values are reported over time (Graham, Harvey and Rajgopal, 2005). EPS smoothing is usually achieved by applying accrual accounting. Even if a firm's cash flow per share (CFPS) varies over time, the EPS can be manipulated to some extent by providing for certain accrual items in the balance sheet. Another factor that

is sometimes considered by investors is the dividend per share (DPS) that their investment will yield. Certain types of investor may prefer high, stable dividend streams. Consequently, some firms may attempt to maximise their share prices by smoothing their DPS.

In this study, an attempt is made to determine if the volatilities of EPS, DPS and CFPS have an influence on share prices. The remainder of this paper consists of five sections. In the first of these, the background to this study is provided. Thereafter, the research objectives are stated. This is followed by a description of the research method employed in the study. The next section contains the empirical results that are obtained. The final section of the study contains the conclusions, managerial implications and recommendations for future research.

2. BACKGROUND TO THE STUDY

Chan, Jegadeesh, Chan and Lakonishok (2001) investigate the relationship between the quality of earnings and future stock prices. Their study indicate that managers and investors devote a large amount of emphasis on reported earnings, and managers therefore have a lot of incentives to utilise accounting rules that will result in more stable earnings growth.

Trueman and Titman (1988) define income smoothing as those actions taken by management that are designed to reduce the fluctuations in the reported net income of their firm. According to them, the main reason for income smoothing is that investors value a firm with smoother earnings. They also argue that smoother earnings could result in a decrease in the cost of borrowing, and create favourable trade between a firm and its customers. According to them, income smoothing could have a positive effect on share value.

Dichev and Tang (2009) indicate that earnings volatility is negatively related to earnings predictability. As a result, investors may prefer lower levels of earnings volatility in order to reduce the uncertainty associated with expected earnings. According to this, firms that report smoother EPS streams would be worth more than those firms that exhibit highly variable earnings. Managers may therefore be tempted to manage their firm's EPS in such a way that smoother values are reported over time. According to Graham *et al.* (2005) the majority of the certified financial officer's (CFO's) interviewed in their study admit to sacrificing long-term economic value in order to smooth their firms' short-term earnings.

One way in which a firm could manage its EPS is to apply accrual accounting (Brigham and Daves, 2007). By providing for accruals in the balance sheet, it is possible to adjust the firm's cash flows in order to report smoother EPS values. It is important to notice, however, that a firm cannot continue to do this over the long-run, and that accruals may have to be reversed somewhere in future. Barnes (2002) investigates the relationship between earnings volatility and the market value of a firm, and reports a negative relationship between the two variables.

According to Rountree, Weston and Allayannis (2008) investors negatively value cash flow volatility. The results of their study indicate that a statistically significant negative relationship exists between cash flow volatility and the value of a firm. Furthermore, it is reported that this effect on firm value is not associated with earnings smoothing by means of accrual estimates. They argue that investors are benefited by investing in firms with smooth cash flows for a number of reasons. These include lower costs associated with external financing, smaller perceived borrowing costs, and greater analyst following which should decrease asymmetric information flows.

A number of South African studies investigate the relationship between the share prices of firms listed on the Johannesburg Securities Exchange Limited (JSE) and EPS, DPS and CFPS. Bhana (1991) examines the market reaction to the announcement of substantial changes to firms' dividend policies, and obtained results that support the information content of dividend hypothesis. In a later study, he investigated the market reaction to special

dividend announcements (Bhana, 1998) and once again found that these changes influenced the value of a firm's shares.

Auret and De Villiers (2000) conducted a study that compared the explanatory power of EPS and DPS to interpret share prices. The results of their study indicate that EPS had greater explanatory power than DPS. Wolmarans (2000) compared the returns of portfolios based on earnings yield and dividend yield strategies, and reports that those portfolios based on earnings yields managed to outperform the dividend yield portfolios. De Villiers and Hamman (2000) and De Villiers, Hamman, Joubert and Le Roux (2003) compare EPS and CFPS as determinants of share prices. The results of both these studies report that changes in EPS provide a statistically significant better explanation of changes in share prices than changes in CFPS.

De Villiers and Auret (1998) compared the ability of EPS and economic value added (EVA) to explain share prices, and report that EPS outperformed EVA. De Wet (2005) investigates the relationship between market value added (MVA) and a number of financial performance measures. He reports weak relationships between MVA and DPS and EPS. Based on this, he questions the use of share valuation techniques based on EPS and DPS. Erasmus (2010; 2008a; 2008b; 2008c) investigates the relationship between a number of financial measures (including EVA, cash flows and earnings) and share returns. Contrary to the results of De Wet (2005), he reports stronger results for earnings than for EVA when the relative information contents of the measures are compared.

Gouws and Van der Poll (2004) investigate the role of book entries in income smoothing for South African firms. They indicate that earnings smoothing is achieved through the use of earnings management by manipulating the earnings figure with the use of accruals. The South African studies reported above, however, predominantly focus on the relationship between share prices and the values of EPS, DPS and CFPS, and the volatility of the measures are not incorporated in the analyses.

3. OBJECTIVES OF THE STUDY

From the preceding discussion of the existing literature it would appear that a relationship between the volatilities of EPS, DPS, CFPS and share prices may exist. The primary objective of this study is therefore to investigate the relationship between the share prices and the volatilities of EPS, DPS and CFPS for a sample of South African firms listed on the JSE. The secondary objectives are twofold. Firstly, an attempt is made to determine if the three measures EPS, DPS and CFPS have a relationship with share prices. Secondly, the data set will be subdivided into three sub-sets to investigate if different results are obtained for firms listed in different sectors of the JSE.

This study extends on the South African studies mentioned in the previous section in three ways. Firstly, the study will incorporate volatility in order to determine if investors value smooth earnings, cash flows and dividend streams. Secondly, a regression analysis technique that is suitable to evaluate panel data, that consist of cross-sectional as well as time-series components, will be applied. Finally, the sample not only focuses on industrial shares like the majority of the previous South African studies, but mining and financial firms are also included in the analysis.

4. RESEARCH METHOD

4.1 Data set

This study focuses on the ten-year period from 2000 to 2009. For the purposes of this study, all firms listed on the Johannesburg Securities Exchange Limited (JSE) during this period are initially considered for inclusion in the data set. The data investigated in this study represent panel data, since data are obtained for different companies over different years. It was therefore decided that it is necessary to use a panel data analysis technique that will consider the cross-sectional (different companies) as well as the time-series (different years) dimensions of the data. The time-series cross-sectional regression (TSCSREG) procedure in SAS is therefore applied to conduct the multiple regression analyses on the data set. In order to ensure that this technique is applied efficiently, it was decided to include only those firms that had data available for at least three years during the ten-year study period. This result in a final data set containing 236 firms that yielded 2 167 firm-year observations.

It is possible that differences may exist between firms listed in different sectors of the JSE. In order to investigate this, the data set was also divided into three sub-sets that contain firms listed on the financial (containing banking, insurance and property investments etc.), basic materials (predominantly mining firms), and other sectors (industrial, consumer goods, consumer services etc.) respectively. By analysing the three sub-sets possible differences that

may exist between firms that operate in different industries can be identified and evaluated.

4.2 Variables

4.2.1 Dependent variable

This study investigates the effect of certain firm-specific factors on the share prices of the firms included in the sample. The dependent variable (SP), are therefore the share prices of the firms included in the data set, as measured at the end of their respective financial years.

4.2.2 Independent variables

The primary objective of this study is to investigate the relationship between share prices and the volatilities of EPS, DPS and CFPS. Furthermore, the relationship between these three measures and share prices are also investigated. Headline EPS, total dividend per share paid during the year and operating cash flow per share values were calculated at the firms' financial year-ends. In order to quantify the volatilities of the three measures (EPSVOL, DPSVOL and CFPSVOL), the standard deviations of the measures were calculated over a period of three years.

4.3 Data

The firm-specific financial information required to calculate the independent variables were downloaded from the McGregor BFA database (2009). This database contains standardised financial statements for all firms listed on the JSE. Share price data at financial year-end were also obtained from the McGregor BFA database.

5. EMPIRICAL RESULTS

5.1 Descriptive statistics

Table 1 contains the descriptive statistics, calculated for the full data set over the entire study period, of the dependent and independent variables included in this study.

Table 1. Descriptive statistics

| | Independent variables | | | |
|--------------------|-----------------------|-----------------------|----------|------------|
| | Dependent variable | Independent variables | | |
| | SP | EPS | DPS | CFPS |
| Mean | 3 241.89 | 293.42 | 126.91 | 500.86 |
| Median | 773.00 | 71.10 | 18.00 | 101.57 |
| Standard deviation | 7 499.81 | 1 490.19 | 413.65 | 4786.53 |
| Minimum | 1.00 | -4 893.00 | 0.00 | -50 233.20 |
| Maximum | 110 551.00 | 61 323.50 | 8 700.00 | 205 962.70 |

From Table 1 it can be seen that the share prices of the firms included in the sample exhibit pronounced levels of variability during the study period. The mean share price during the period under investigation amounted to 3 241.89 cents per share, while the median value is substantially lower at 773.00 cents per share. The minimum and maximum values further highlight the differences that exist between the share values of the different firms.

In terms of the independent variables, significant levels of variation are also observed. Large differences between the mean and median values could furthermore point towards the inclusion of outlier values in the data set. This is also evident from the minimum and maximum values reported.

Relatively large standard deviations are reported for all three the independent variables.

5.2 Correlation analysis

In order to investigate the relationships between the variables, a correlation analysis is conducted. Since the descriptive statistics point towards the possible inclusion of outlier values in the data set, it was decided to conduct a Spearman Rank Order correlation analysis, since this technique is less sensitive to outlier values than the Pearson Product Moment correlation analysis. The results of the Spearman Rank Order correlation analysis between the dependent and the independent variables, based on the full data set, are provided in Table 2.

Table 2. Results from Spearman Rank Order correlation analysis for the full data set

| | Full data set | | | | | | |
|---------|--------------------|-----------------------|----------|----------|----------|----------|--------|
| | Dependent variable | Independent variables | | | | | |
| | | SP | EPS | DPS | CFPS | EPSVOL | DPSVOL |
| SP | 1.000 | | | | | | |
| EPS | 0.827*** | 1.000 | | | | | |
| DPS | 0.736*** | 0.752*** | 1.000 | | | | |
| CFPS | 0.803*** | 0.790*** | 0.677*** | 1.000 | | | |
| EPSVOL | 0.778*** | 0.623*** | 0.540*** | 0.675*** | 1.000 | | |
| DPSVOL | 0.723*** | 0.677*** | 0.803*** | 0.676*** | 0.639*** | 1.000 | |
| CFPSVOL | 0.756*** | 0.633*** | 0.561*** | 0.697*** | 0.855*** | 0.631*** | 1.000 |

Note: *** Significant at the 1% level

In terms of the dependent variable, relatively large, positive correlations are observed with EPS, DPS and CFPS. The correlations are furthermore all statistically significant at the 1% level. Based on the results from the correlation analysis it can therefore be seen that positive relationships exist between share prices and a firm's earnings, dividend levels and its cash flows.

When the correlations between the dependent variable and the volatility measures are considered, slightly lower correlations are observed. The correlations are all still highly statistically significant though. The lowest correlation coefficients for the volatility measures are observed when DPS is considered.

One of the problems associated with correlation analysis is that it cannot be used to establish causation amongst the variables being investigated. Therefore,

it cannot be stated that the change in one variable caused the change in another variable. The direction of the relationship is also indeterminate (Coldwell and Herbst, 2004: 107-109). Multivariate regression analyses are therefore conducted to evaluate the nature of the relationships between the dependent and the independent variables.

5.3 Multiple regression analysis

The results from a TSCSREG multiple regression analysis that included all three the firm-specific variables based on the full data set are provided in Table 3. In order to evaluate whether the previous year's values also have an effect on share prices, one-year lagged values of the three independent variables were also included in the regression analysis.

Table 3. Results from the multiple regression analysis based on the full data set

| | Full data set | |
|-------------------------|-------------------------|---------|
| | Estimate | t-value |
| Intercept | 1 627.64 ^{***} | 4.65 |
| EPS | 1.515 ^{***} | 12.19 |
| EPS_1 | 0.246 ^{***} | 4.52 |
| DPS | 7.670 ^{***} | 26.94 |
| DPS_1 | 2.076 ^{***} | 8.03 |
| CFPS | 0.070 ^{***} | 4.42 |
| CFPS_1 | -0.369 ^{***} | -10.03 |
| Adjusted R ² | 0.470 | |

Note: ^{***} Significant at the 1% level

EPS_1, DPS_1 and CFPS_1 are the one-year lagged values of EPS, DPS and CFPS respectively

The adjusted R² value of 0.47 indicates that the independent variables included in the regression analysis are able to explain 47% of the variation of the independent variable. In terms of the regression coefficients obtained from the multiple regression analysis, statistically significant positive values are observed for all three the independent variables. The highest regression coefficients are obtained for DPS and DPS_1 respectively, indicating a significant positive relationship between share prices and the dividend payments made by a firm. Although the regression coefficients obtained for EPS and CFPS are lower, they still point to a significant positive

relationship with share prices. The only negative regression coefficient is observed for the one-year lagged value of CFPS.

Based on the results reported in Table 3, it would appear that a relationship between the three independent variables and share prices exists when the full data set is considered. In order to evaluate possible differences that may exist between the results obtained for firms operating in different industries, similar multiple TSCSREG analyses were also conducted on the three sub-sets containing the basic materials, financial and other firms. The results are provided in Table 4.

Table 4. Results from the multiple regression analysis based on the three sub-sets

| | Basic materials | | Financials | | Others | |
|-------------------------|-------------------------|---------|------------------------|---------|----------------------|---------|
| | Estimate | t-value | Estimate | t-value | Estimate | t-value |
| Intercept | 4 200.44 ^{***} | 3.40 | 713.655 ^{***} | 2.69 | 49.745 | 0.33 |
| EPS | 2.485 ^{***} | 6.15 | 2.601 ^{***} | 7.27 | 8.622 ^{***} | 32.03 |
| EPS_1 | 0.087 | 0.84 | 2.457 ^{***} | 6.36 | 0.637 [*] | 1.79 |
| DPS | 7.005 ^{***} | 10.55 | 4.443 ^{***} | 6.82 | 2.367 ^{***} | 7.84 |
| DPS_1 | 2.294 ^{***} | 3.87 | 0.861 ^{***} | 2.74 | 0.806 ^{***} | 2.65 |
| CFPS | 0.017 | 0.54 | -0.025 | -0.73 | -0.135 | -1.06 |
| CFPS_1 | -0.7255 ^{***} | -5.78 | 0.014 | 0.44 | 0.091 | 0.43 |
| Adjusted R ² | 0.506 | | 0.511 | | 0.819 | |

Note: ^{***} Significant at the 1% level

^{**} Significant at the 5% level

^{*} Significant at the 10% level

EPS_1, DPS_1 and CFPS_1 are the one-year lagged values of EPS, DPS and CFPS respectively

When considering the regression coefficients of the current year's EPS and DPS, statistically significant positive relationships are observed for all three the sub-sets. It would appear that the current year's earnings and dividend payments plays an important role in terms of the current year's share price for all the firms included in the study. The regression coefficients of the current year's CFPS, however, are not all statistically significant. The signs of the regression coefficient also differ between the sub-set containing the basic resource firms, and the other two sub-sets.

In terms of the lagged variables, statistically significant regression coefficients are observed for all three sub-sets in terms of DPS. It would therefore appear that it is not only the current year's dividend payments that are important, but also the preceding year's dividends. In the case of lagged EPS, mixed results are obtained for the three sub-sets. In the case of the sub-set containing those firms listed on the basic materials sector, the coefficient is not statistically significant. For the sub-set containing the other firms it is statistically significant at the 10% level, while it is highly statistically significant for the sub-set of firms listed on the financial sector. It is

interesting to note that the only lagged CFPS variable with a statistically significant regression coefficient is obtained for the basic materials firms.

Different adjusted R^2 values are also obtained for the regression analyses conducted on the three sub-sets. In the case of the basic materials and financial sub-sets, the two R^2 values are relatively close to 0.51. For the sub-set containing those firms listed on the other sectors, however, a much higher R^2 value of 0.819 is observed. This indicates that almost 82% of

the variation in share prices for firms listed on this sector is explained by the variation in the independent variables.

In order to evaluate the effect of the volatility of the three independent variables on share prices, a multiple TSCSREG analysis that incorporates the standard deviations of the three independent measures was also conducted. The results from the regression analysis conducted on the full data set are provided in Table 5.

Table 5. Results from the multiple regression analysis based on the volatility measures for the full data set

| | Full data set | |
|----------------|---------------|---------|
| | Estimate | t-value |
| Intercept | 2 910.62*** | 5.66 |
| EPSVOL | 0.209** | 2.10 |
| DPSVOL | 7.313*** | 12.25 |
| CFPSVOL | - 0.022 | -0.73 |
| Adjusted R^2 | 0.086 | |

Note: *** Significant at the 1% level
** Significant at the 5% level

From Table 5 it can be seen that the relationship between dividend volatility (DPSVOL) and share prices are highly statistically significant and positive. The relationship between share prices and earnings volatility is also statistically significant (at the 5% level) and positive. The sign of the regression coefficients for these two variables are of interest, since it implies that an increase in volatility (as measured by the standard deviation of the measures) results in an increase in share prices.

The relationship between share returns and cash flow volatility is negative and not statistically significant. This finding is of interest, since it differs slightly from the results reported by Rountree *et al.*

(2008) where a highly significant negative relationship between cash flow volatility and firm value was obtained.

If the adjusted R^2 value of the regression analysis is considered, however, it can be seen that less than 9% of the variation in share returns is explained by the variation in the three volatility measures include in the multiple regression model.

In order to investigate whether different results are obtained for firms operating in different industries, multiple regression analyses were also conducted on the three subsets containing the data of the firms listed in the basic materials, financial and other sectors. The results are provided in Table 6.

Table 6. Results from the multiple regression analysis based on the volatility measures for the three subsets

| | Basic materials | | Financials | | Other | |
|----------------|-----------------|---------|-------------|---------|-------------|---------|
| | Estimate | t-value | Estimate | t-value | Estimate | t-value |
| Intercept | 5 653.87*** | 3.65 | 2 342.79*** | 3.92 | 2 503.24*** | 5.09 |
| EPSVOL | 0.165 | 0.86 | -0.789 | -0.94 | -0.795 | -0.70 |
| DPSVOL | 11.241*** | 8.20 | -0.904 | -1.26 | 0.467 | 0.45 |
| CFPSVOL | -0.014 | -0.24 | 0.078 | 1.09 | -0.144 | -0.28 |
| Adjusted R^2 | 0.180 | | 0.007 | | 0.001 | |

When the results reported in Table 6 are compared to those reported in Table 5, a number of interesting observations can be made. First of all, the only variable with a statistically significant regression coefficient is DPSVOL in the case of the sub-set containing the firms listed in the basic materials sector. The remaining coefficients are all statistically insignificant. In terms of the adjusted R^2 values, a much higher value is also observed for the sub-set of firms listed in the basic materials sector when compared to the other two sub-sets.

6. CONCLUSIONS, MANAGERIAL IMPLICATIONS AND FUTURE RESEARCH

If investors predominantly focus on the published earnings figures of a firm when making their investment decisions, a smooth earnings stream could result in a higher firm value, since the lower uncertainty with regard to future earnings could simplify and improve traditional valuation techniques. Similarly, smoother dividend and cash flow streams

could also enable investors to improve their decision-making. This study investigates the relationship between a firm's share price and the volatilities of its earnings, dividends and cash flows.

Based on the results of this study, it appears as if share prices may be influenced by the volatility of a firm's dividend per share and earnings per share. Cash flow per share volatility, however, does not have a statistically significant relationship with share prices. This could be an indication that the reported earnings, as well as the dividend payments that a firm makes, are important to investors while the cash flow position are of less importance. This could provide support to the argument that investors incorporate the easily-accessible earnings and dividend figures when making investment decisions. When considering firms listed in different sectors of the JSE, differences in the results are observed. This could be an indication that different factors are important for firms that operate in different industries. In particular, dividend volatility appears to be of importance for firms listed in the basic materials sector of the JSE. Managers of firms operating in this sector should therefore be careful when deciding on adjustments to their dividend policies.

This study focuses on a period of only ten years. In future research a longer study period should be considered in order to investigate the possible effect of changes in the economic environment on the volatilities of the variables, and also their relationship with share prices. The results of this study indicate differences between the firms listed in the different sectors. Future research could focus on the identification of those industry-specific factors that influence earnings, dividend and cash flow values.

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