Re-rating your price earnings (P/E) multiple

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Price earnings (P/E) multiples are commonly used by corporate financial managers as a measure of corporate performance and as a measure of corporate value. With this article an analysis of 74 companies is presented. Each company significantly changed its P/E multiple over a period of three years. The analysis shows that a 2% improvement in operating profit margin or a 2% reduction in financial risk achieved a 1% improvement in the P/E multiple. To a lesser extent, an improvement in the current ratio and in net asset value also resulted in an improved P/E multiple.

Die prysverdiensteverhouding word algemeen deur korporatiewe finansiële bestuurders as maatstaf van 'n maatskappy se korporatiewe prestasie en vir die waardasie van 'n maatskappy gebruik. In hierdie artikel word 'n ontleding van 74 maatskappye gedoen, waarin daar 'n merkbare verandering in hulle prysverdiensteverhouding oor 'n tydperk van drie jaar was. Die analises in die artikel toon dat 'n toename van 2% in 'n maatskappy se bedryfswinsmarge, of 'n afname van 2% in finansiële risiko, tot ongeveer 1% verbetering in die prysverdiensteverhouding lei. Navorsing toon dat 'n verbetering in die bedryfskapitaalverhouding en in die netto bate-waardeverhouding in 'n mindere mate tot 'n verbetering in die prysverdiensteverhouding lei.

Introduction

Modern financial theory has little use for P/E multiples. Yet, outside the ivory towers of academia, corporate financial managers frequently use them. P/E multiples are commonly used to value companies as well as to measure corporate performance. Many companies actively strive to improve their P/E multiple — to the extent of making this a corporate goal. Others focus their strategic planning on maximizing growth in earnings per share (EPS), believing that this will maximize the company's P/E multiple and hence its share value (Firer, 1992). In the face of this widespread usage, why is financial theory so silent on the subject of P/E multiples?

The popularity of the P/E multiple in the corporate environment stems from the pure simplicity of the ratio itself. In essence, a P/E multiple encapsulates all the information that links a company's earnings with its share price. It is small wonder then that the P/E multiple is popular. It is readily understood by the market, easily applied and intuitive. If a company can increase its P/E multiple, the share price will show a corresponding increase.

Unfortunately, however, a P/E multiple is not an end in itself. How does one determine what a company's P/E multiple should be? How does one improve it? In practise, the estimation of a P/E multiple is little more than an educated guess. It makes a mockery of the careful accounting used to estimate the company's sustainable earnings and hence market 'value'. Most corporate financial advisors would be surprised to learn how weak the statistical relationship between a company's P/E multiple and its historic growth in earnings is.

A large amount of academic research has in fact been directed at the linkages between P/E multiples and other measures of financial performance (e.g. Peavy & Goodman, 1985; Reilly, Griggs & Wong, 1983; Stathoulis, 1987; Beaver & Morse, 1978; Bierman, 1982; Simler, 1974; Firer, 1992). Whilst many of these studies have found statistically significant relationships between the P/E multiple and other variables, none of the associations have been strong.

Academic arguments against the use of P/E multiples come from two fronts. Firstly, as mentioned above, the P/E multiple simply represents a multitude of underlying complex economic and financial relationships. Economic theory suggests that it is more useful to focus upon the determinants of the P/E multiple rather than the P/E multiple itself.

Secondly, academics argue that cashflow, and not earnings, is a better indicator of company value (e.g. Stewart, 1990: 22f). Although cash flow is likely to be strongly correlated with earnings, it is the former which has economic value to the investor, and is therefore likely to be a better predictor of share price. In essence, financial theory suggests that economic measures and not accounting measures should be used to predict a company's share price and hence market value.

Objectives

Notwithstanding the above discussion and the academic reservations on the subject, the objective of this article is to empirically determine which underlying variables, identified by financial theory as being determinants of value, have the largest influence on a company's P/E multiple. It should then be possible, as the title suggests, to identify the factors which would effect a re-rating of a company's P/E multiple.

Methodology

Identification of independent variables

The P/E multiple simply reflects the link between company performance and share price. Financial theory however, identifies three major groups of independent variables, including various measures of performance which, in combination, determine company value and hence share price (see Table 1).

Company performance is theoretically the most important determinant of a P/E multiple. However, the risk profile and the economic environment in which the company operates are also likely to have some influence. A number of proxy measures for company performance exist and Stathoulis (1987) develops, from the theory, several proxies which

Table 1 Determinants of corporate value

Independent variable	Proxies (Stathoulis, 1987)
Company performance	Earnings per share; dividends per share; operating profit margin; sustainable growth rate.
Company risk	Debt/equity ratio; interest cover; current ratio; net asset value; capital employed.
Economic environment	Tradeability (value of shares traded as a % of market capitalization); dividend yield.

might be expected to be associated with changes in P/E multiples. These are shown in Table 1 and constitute the basis for the independent variables analyzed in this study.

Sampling and data collection

The Ivor Jones, Roy & Co. financial data base was used to obtain the required data. This data base contains extensive financial data, which has been standardized from an accounting perspective to make the individual companies more comparable. It constitutes an ideal source of data for this type of study. No sampling was performed; the entire population of industrial companies listed on the Johannesburg Stock Exchange in 1984 and which were still listed in 1992 was included in the analysis.

Analytical technique

The methodology involved two cross-sectional studies. The average value over three years for each of the variables identified in Table 1 was calculated for the 'start period' (1985–1987) and the 'end period' (1989–1991). The percentage change in the average of each variable over the intervening period was then calculated. The resulting data matrix reflected the percentage change in the P/E multiple for 132 companies together with the percentage change in each of the independent variables. Since the objective of the study was to determine which factors have the largest influence upon the P/E multiple the observations were ranked in descending order of percentage change in P/E multiple. All the observations in which the P/E multiple had not changed by more than 10% were removed from the data. A total of 74 companies, those which reflected the most significant change in their P/E multiple, was retained for analysis.

A correlation analysis was performed on the data to determine the extent and significance of any associations existent in the data.

A stepwise regression technique was used to construct a multiple linear regression equation to predict changes in P/E multiples as a result of changes in the independent variables.

Least squares estimation of regression coefficients is critically affected by the presence of outlying observations. When several independent variables are included in the model it is difficult to identify outliers by simple observation of the data and robust regression techniques are called for. Robust regression procedures seek to reduce the influence of outliers and construct estimates of the regression coefficients based on the body of data.

The presence of outliers was indicated in the data as a consequence of the sample-selection technique described above. A least absolute deviation procedure was used to identify outliers and to re-weight the observations appropriately. The least squares regression analysis referred to above was performed on the weighted data.

Results

Correlation analysis

Presented in Table 2 are the results of the correlation analysis (see Table 2).

Only four independent variables exhibited a statistically significant association with the change in the P/E multiple; earnings per share, operating profit margin, the Debt/Equity ratio and financial risk. All four show a weak to moderately strong association with the dependent variable.

If one considers the P/E multiple in isolation it follows that an increase in the denominator will reduce the P/E. However, the analysis above indicates that companies which were able to generate relatively greater increases in EPS over the review period were rewarded with improved P/E multiples. This makes intuitive sense. A significant gain in

Table 2 Correlation coefficients between the independent variables and the P/E multiple

Independent variable	Mean (%)	Standard deviation	Correlation with P/E	t Value	Significant (Y/N) $\alpha = 0.1$
Earnings per share	1.21	2.8	0.34	3.04	Y
Dividends per share	1.49	2.3	0.11	0.96	N
Operating profit margin	0.05	0.5	0.41	3.80	Y
Sustainable growth rate	0.25	1.1	0.19	0.05	N
Debt/Equity ratio	2.75	17.9	–0.28	–1.69	Y
Interest cover	0.37	3.0	-0.01	-0.03	N
Current ratio	0.14	1.2	0.12	1.06	N
Net asset value	0.82	0.9	0.12	0.55	N
Capital employed	16.2	51.0	–0.04	–0.35	N
Financial risk	0.35	0.5	–0.24	–2.13	Y
Dividend yield	0.46	2.0	–0.17	–1.33	N

EPS is accompanied by an even greater increase in the share price and hence a re-rating of the P/E multiple. Shareholders perceive an increase in EPS as an indication of long term improved profitability.

Operating profit margin is a key ratio measuring efficiency as well as profitability. Any improvement in operating profit margin would have a direct impact upon earnings and hence the P/E multiple. The strong positive association is as expected.

The Debt/Equity ratio showed an inverse relationship to the P/E multiple. Since the Debt/Equity ratio is a measure of risk the inverse relationship is appropriate. Companies which show an increase in their gearing (and hence risk) are likely to lower their P/E multiple.

The inverse association between the P/E multiple and financial risk is also statistically significant. 'Financial risk' is the Ivor Jones, Roy, & Co measure of long term and short term financial exposure. As with the Debt/Equity ratio discussed above, the inverse relationship is as expected.

Regression analysis

The results of the stepwise regression analysis are presented in Table 3.

Table 3 Results of the multiple regression analysis

Independent variable	Parameter estimate	t Value	Simple R^2	Significant (Y/N) $\alpha = 0.1$
Intercept	–0.04	–0.76	—	N
Gross profit margin	0.49	5.66	0.17	Y
Financial risk	–0.46	–4.50	0.06	Y
Current ratio	0.18	3.76	0.02	Y
Net asset value	0.09	2.24	0.01	Y
F-ratio	11.9			
Root mean square error	0.28			
R^2	0.40			
Adjusted R^2	0.37			
Sample size	74			

The correlation analysis and multiple regression analysis revealed a significant degree of multicollinearity between the independent variables. The stepwise regression procedure effectively solved this problem by excluding variables which measured the same dimension.

Change in earnings per share was rejected in favour of change in gross profit margin. Change in financial risk was retained over change in the Debt/Equity ratio. Two new variables, change in net asset value and change in the current ratio, were included in the model in spite of the fact that the simple correlation coefficient between each of these and the dependent variable was not statistically significant. Change in net asset value, as one would expect, was positively associated with change in the P/E multiple. The positive coefficient on the current ratio is a reflection of the fact that an improvement in the current ratio is an indication of reduced risk and hence an improved P/E multiple.

All of the independent variables were significant at a 90% confidence level. Although the Y axis intercept was not significantly different from zero, no attempt was made to force the regression line through zero.

The final model is shown below:

% Change in P/E = –0.04
+0.49 x % change in gross profit margin
–0.46 x % change in financial risk
+ 0.18 x % change in the current ratio
+ 0.09 x % change in net asset value

The model explained 37% of the variance in the data — a reasonably good result for this type of analysis. The final sample included 74 companies. Shown in Table 4 are the predicted against actual P/E multiples for some of the larger companies in the sample.

Revealed in Table 4 is the inadequacy of the regression equation. In general, the predicted change in the P/E multiple is in the same direction as the actual change although there are exceptions: PPC; I & J; Fedfood and Ellerine. The model also tends to underestimate the extreme changes. For example, Cadswep actually achieved a 117% improvement

Table 4 Predicted versus actual changes in P/E multiples for selected companies

Company name	Avg.P/E start	Avg.P/E end	Actual % change	Predicted % change
Anglo Alpha	14.2	8.2	–42.3	–25.6
AECI	10.4	8.3	–20.2	–10.6
Afrox	13.0	15.2	16.9	13.5
Altech	15.8	11.0	–30.4	–16.2
Anglovaal Ind	7.5	11.7	56.0	6.9
C G S Food	10.5	13.4	27.6	3.6
Cadswep	10.8	23.5	117.6	23.1
Chemserve	9.9	7.5	–24.2	–5.2
Clicks	20.6	13.9	–32.5	–1.2
CNA Gallo	9.2	12.9	40.2	19.1
Consol	8.1	17.2	112.3	14.1
Cullinan	8.2	9.3	13.4	15.7
Dorbyl	8.4	5.4	–35.7	–16.3
Edgars	12.8	15.8	23.4	35.8
Ellerine	5.9	4.8	–18.6	13.4
Engen	8.3	9.4	13.3	16.7
Everite	22.2	11.3	–49.1	–9.4
Fedfood	6.7	5.8	–13.4	3.5
Foschini	10.0	16.0	60.0	16.4
Frame	12.9	0.9	–93.0	–96.2
Grinaker	5.6	8.8	57.1	0.4
Haggie	10.5	8.3	–21.0	–15.9
I & J	11.1	13.0	17.1	–5.7
Kersaf	18.4	11.5	–37.5	–13.0
Pepkor	14.6	10.0	–31.5	–18.7
Perskor	3.3	5.4	63.6	3.3
Plate Glass	11.7	15.8	35.0	10.3
PPC	8.8	10.0	13.6	–31.8
Romatex	13.9	10.0	–28.1	–7.0

in their P/E multiple compared with a predicted improvement of 23%.

In spite of these shortcomings the model correctly predicted the direction of the re-rating for 57 (76%) of the 74 companies in the sample.

Conclusion

The objective of this research was to determine which factors influence a re-rating of a company's P/E multiple. The analysis revealed four variables — change in operating profit margin, change in financial risk, change in the current ratio and change in the net asset value. Of these, the first two carry significantly more weight in the model than the others. The final regression equation indicated that a 2% increase in operating profit margin or 2% decrease in financial risk (gearing) would result in an approximate 1% improvement in the company's P/E multiple.

References

Beaver, W. & Morse, D. 1978. 'What determines price-earnings ratios?' *Financial Analysts Journal*, Vol. 34, No. 4: 50–61.

Bierman, H. 1982. 'Toward a constant price-earnings ratio', *Financial Analysts Journal*, Vol. 38, No. 5: 62–65.

Firer, C. 1992. *The P/E ratio and the cost of equity capital.* Unpublished working paper.

Peavy, J.W. & Goodman, D.A. 1985. 'How inflation, risk and corporate profitability affect common stock returns', *Financial Analysts Journal*, Vol. 41, No. 5: 59–65.

Reilly, F.K., Griggs, F.T. & Wong, W. 1983. 'Determinants of the aggragate stock market earnings multiple', *The Journal of Portfolio Management*, Vol. 10, No. 1: 36–44.

Simler, H. 1974. *The determinants of low price earnings ratios of industrial securities quoted on the Johannesburg Stock Exchange.* Unpublished MBA Research Report. Johannesburg: University of the Witwatersrand. 65p.

Stathoulis, J.P. 1987. *An analysis of the P/E ratio in the industrial sector of the JSE.* Unpublished MBA Research Report. Johannesburg: University of the Witwatersrand. 147p.

Stewart, G.B. 1990. *The quest for value.* New York: Harper Collins. 781p.