

Determinants of Price-Earnings Ratio: The Case of Chemical Sector of Pakistan

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Abstract

Price-to-Earnings (P/E) ratio, a relative valuation technique has always remained at the centre of attention of market analysts and investors ever since the origin of discounted dividend growth model of Gordon and Shapiro (1956). The present study attempts to identify the factors explaining variations in P/E ratio for chemical sector of Pakistan by using Ordinary Least Square (OLS) regression on pooled data of 25 firms listed at Karachi stock exchange for the period 2005 to 2009. Furthermore, taking into account the volatility in Pakistani stock market during the study period, a time-series analysis has also made by using OLS regression model to examine whether determinants of P/E ratio differ across years or not. Results demonstrate that Dividend payout ratio and Tobin's Q remain the most important determinants of P/E ratios for pooled as well as time-series analysis. The study is expected to facilitate decision makers to evaluate factors that explain variations in firm's P/E ratio in order to attract investor's attention and raise their confidence to select these firms in their portfolios.

Keywords: price-earnings ratio (P/E ratio), Karachi Stock Exchange, market volatility, chemical sector, Pakistan.

1. Introduction

Considerable research has focused on analyzing the stock market performance using different financial ratios for example Price-to-Earnings (P/E) ratio, Price-to-Sales ratio, Price-to-Dividend ratio and Book-to-Market ratio (Bodie et al., 2005). However, researchers, market analysts, fund managers and investors mostly rely on Price-to-Earnings ratio for analyzing relative attractiveness of equity investments

and use it as a valuation technique for performance evaluation of individual stocks, sectors and markets (Molodovsky 1953). P/E ratio, measured as dividing stock price by earnings per share, alternatively known as “Price Earnings Multiples”, indicates how much investors are willing to pay for each rupee of firm’s earnings. In addition, it also reflects investor’s confidence and sentiment about firm’s future performance and influences investment decisions.

Theorists, focusing on stock price volatility, stated that price-earnings ratio of individual stocks and markets depict variability across time, indicating that stock markets had always been facing irrational pricing, speculation and financial bubbles, therefore, the investors have various valuation techniques to identify whether the stock market is rationally priced or not and how much they should pay for every \$1 of firm’s earnings. Empirical researchers therefore, tried to examine the determinants of P/E ratio, in order to identify the factors that can influence P/E ratio and ultimately the investor’s confidence towards firms for making investment decisions.

Existing literature has examined the determinants of P/E ratio by using different proxies for risk, growth, discount rate and dividend payout mostly in developed countries (White, 2000; Shamsuddin and Hiller, 2004 and Dudney et al., 2008), However, relatively fewer studies have investigated the factors affecting P/E ratio in developing countries (Ramcharran 2002; Kumar and Warne 2009 and Azam 2010). In addition to firm-specific factors, some studies have incorporated sectoral, year and size effects (Anderson and Brooks, 2006; and Kumar and Warne, 2009). However, in the context of Pakistan, no study has evaluated firm-specific determinants of price-earnings ratio, while controlling for the firm size, year and sector effects.

Pakistani stock market is an emerging market, and has remained highly volatile during the last decade. The KSE 100 index showed an upward trend through 2005 to 2007 and reached at its peak on 20th April 2008 with 15,676 points. However, this trend could not be sustained due to global financial crisis and country’s rising political uncertainty coupled with declining economic conditions, which led to a sharp decline in stock prices, and the stock market closed at 5,865 points on 30th December 2008. This descending inclination of stock market continued during 2009 and investors remained reluctant to invest in stock market. (KSE Annual Report 2009, economic survey of Pakistan 2009).

Besides overall stock market, Share prices and P/E ratios vary across sectors because of diverse growth prospects, typically sectors having companies with mature, stable and moderate growth potential have low P/E ratios compared to the sectors having relatively young and fast-growing companies (Anderson and Brooks

2006). Present study, therefore, examines P/E ratio of chemical sector in order to identify factors explaining variations in P/E ratio particular to this industry. The selection of this industry is backed by couple of reasons: Firstly, chemical industry plays a significant role in economic development of country as it provides integral components to all manufacturing sectors like pharmaceuticals, textiles, food and construction.

Moreover, the import of chemical products is 17% of the total import bill, which is quite significant for a small open economy like Pakistan. Secondly, during July-March 2007-2008 large scale manufacturing firms showed 4% growth, next year political disruption, acute energy shortages, high cost of doing business, and low domestic and international demand for Pakistan's manufactured products led these firms to show a decline in growth of -7.7% in all major sectors with three or four exceptions, includes fertilizers and chemicals with 25% growth. (Source: Federal Bureau of Statistic). Thirdly, chemical sector continued to grow as one of the major player in the stock market up to April 2008, with a 27% increase in share prices during July-April 2007-2008, as compared to an increase of 5.9% during the last year, but due to contagion effects of global financial crisis along with rising political uncertainty and worsening economic conditions in Pakistan, share prices showed a sharp decline, including market freeze for four months (27th, August 2008 to 12th December 2008), which continued till year 2009.

However, in context of Pakistan, despite of high volatility in share prices and investment opportunities in chemical sector firms, the factors determining P/E ratio has yet not been fully examined. Therefore, current study contributes to the existing literature in two ways, firstly, by investigating the factors that explain variations in P/E ratios of 25 firms in chemical sector during 2005-2009, secondly, for a deeper insight, time-series analysis has been undertaken in order to identify the year effect on P/E ratio of chemical firms. The study is expected to help decision makers in identifying the significant factors that influence the corporation's P/E ratio, so that they can attract investor's attention and raise their confidence to select these firms in their portfolios.

2. Literature Review

The relationship between share prices and fundamentals (e.g. firm earnings, dividends and book-value per share) has always remained as the focus area of interest for market analysts, fund managers and investors. In this regard, the Price-to-earnings ratio has gained enormous popularity for evaluating individual stocks, sectors and stock markets as potential investments (Molodovsky 1953). Existing literature has classified the determinants of Price-earnings ratio according to the market analysis and sector analysis.

Numerous researchers conducted market analysis by using different sample data in both developed and developing countries and found mixed evidence regarding the determinants of P/E ratio. A number of studies have examined the determinants of P/E ratios for the U.S economy. Reilly et al. (1983) examined a time series relationship of price-to-earnings ratio by using multiple regression model for quarterly standard & poor 500 data for the period of 1963 to 1980. Results showed that P/E ratio increased with an increase in dividend payout, realized earnings growth, and dividend growth and decreased with an increase in business failure rate, risk-free return, inflation and earnings volatility. A study covering the period of 1953-1994, Kane et al. (1996), examined the relationship between P/E ratio and market volatility for standard & poor's 500 index. Regression analysis depicted that market volatility, inflation rate and detrued industrial production (percentage deviation from the trend line) had significant negative relationship with P/E ratio, whereas the impact of real rate and dividend yield were also negative but statistically insignificant.

Based on quarterly standard and poor 500 index data for the period 1968-1993, Loughlin (1996) concluded that dividend payout and expected earnings were positively related to P/E ratio with highest explanatory power and rate on treasury notes was inversely related to P/E ratio. Using S&P 500 index data for the period of 1926-1997, White (2000) used multiple regression model and found dividend payout, dividend yield, earnings growth, GDP growth, Inflation, Federal P/E index, market return, standard deviation of returns, and T-bill rates as the significant determinants of P/E ratio, with dividend payout and dividend yield with the highest explanatory power. By utilizing data of standard & poor 500 index from 1953 to 2003, Dudney et al. (2008) examined the effect of fundamental factors on Earnings-to-price ratio and reported that short term interest rate, default risk premium, tax rates, inflation and expected growth explained significant variations in E/P ratios.

A quarterly time series research for the Australian market covering the period 1984-1 & 2001-3 has been conducted by Shamsudin and Hiller (2004) to investigate the fundamental factors of price-earnings ratio for the ASE 200 Index. Estimated results reported P/E ratio as an increasing function of dividend payout ratio, appreciation of the Australian currency, increase in GDP, and an improvement in consumer's confidence, while a decreasing function of interest rates and market volatility. From the developing equity market of India, obtaining data on BSE 100 index for the period 1997-2001, Gill (2003) concluded that high earnings lead to increase in P/E ratios and the firms with high and sustainable EPS growth rate should be identified for making investments.

A few empirical studies have examined the determinants of Price-earnings ratio by incorporating sectoral, year and size effects. Obtaining the data for all UK firms from 1975 to 2003, Anderson and Brooks (2006) concluded that along with firm specific variables, firms P/E ratios are also influenced by three basic factors i.e. firm's size, the year in which P/E is calculated and the industry effect. Alford (1992) also found that selection of firms on the basis of industry explains much of the variations in P/E ratios. Furthermore, obtaining a sample of 1203 US firms, Cho (1994) examined the explanatory powers of firm size and industry after holding other determinants constant by classifying total firms into five industries according to the nature of their business. Regression results depicted that mining industry explained the most significant differences in E/P ratio as compared to other industries and firm size had a negative relationship with E/P ratio. From emerging equity markets, Kumar and Warne (2009) made a sector-wise and yearly analysis by using data of 243 companies listed at Bombay Stock Exchange for the period 2001-2007, regression results showed that variability in market price and corporate size were the most significant determinants of P/E ratios for Indian capital market.

In the context of Pakistan, Azam (2010) obtained the data for 35 dividend paying firms listed at Karachi Stock Exchange for the period 2000-2008, and explored the effect of fundamental variables i.e. dividend payout ratio, discount rate and earnings growth on Price-earnings ratio. Regression results illustrated that earnings growth and dividend payout ratio had a significant positive relationship with P/E ratio and interest rate had a negative relationship with P/E Ratio. However, in Pakistan, to the best of authors' knowledge, no study has evaluated the determinants of price-earnings ratios at firm level, while controlling for firm size, year and sector effects. Therefore, the current study is a contribution to the existing literature on determinants of price-earnings ratio for chemical sector of Pakistan Stock Market by using annual data of 25 firms listed at Karachi stock exchange for the period 2005 to 2009. The study is expected to provide insight to the decision makers for attracting investor's attention by identifying significant factors that influence the firm's P/E ratio.

3. METHODOLOGY

The factors explaining variations in price-to-earnings ratio of chemical sector are evaluated by using Ordinary Least Square (OLS) regression on pooled data for the period 2005-2009. Furthermore, taking into account the volatility in Pakistani stock market during the study period, a time-series analysis has also made by using OLS regression model to examine whether the determinants of P/E ratio differ across years and affect the investment decisions of investors or not. In order to test the appropriateness of OLS regression technique, test of normality of data i.e. Kolmogorov-Smirnov test (K-S test) is applied on response variable i.e. P/E ratio,

and insignificant p-value implies that data is normal and further analysis could be carried out through OLS model.

3.1. Empirical Model

Following Kumar and Warne (2009) the current study investigates price-to-earnings ratio as a function of dividend payout ratio, Tobin's Q, leverage, variability in market prices, earnings growth, market return and size. The total numbers of firm belonging to chemical sector are 28, and because of unavailability of share price data, final sample is reduced to 25 firms. The empirical analysis involves two stages: firstly, regression analysis based on pooled data using 125 observations for each variable and secondly regression analysis based on time-series analysis by estimating a separate equation for each year.

$$(PE)_{it} = \alpha + \beta_1 DP_{it} + \beta_2 Q_{it} + \beta_3 LEV_{it} + \beta_4 MktRtrn_{it} + \beta_5 VMP_{it} + \beta_6 EGrowth_{it} + \beta_7 SIZE_{it} + e$$

Where,

PE_{it} = Price-earnings ratio, calculated by ratio of share price to earnings per share, of firm i for time period t.

DP_{it} = Dividend Payout, measured by ratio of dividend per share to earnings per share, of firm i for time period t.

Q_{it} = Tobin's Q, measured by ratio of total market value of firm to total book value of asset, of firm i for time period t.

LEV_{it} = Leverage, computed as ratio of total debt to total assets, of firm i for time period t.

$MktRtrn_{it}$ = Market Return, measured by ratio of Dividend + change in share price to last year share price, of firm i for time period t.

VMP_{it} = Variability in market price, calculated as standard deviation of average of high and low market prices, of firm i for time period t,

$EGrowth_{it}$ = Earnings Growth, computed as percentage change in net income, of firm i for time period t.

$SIZE_{it}$ = Corporate size, measured as natural log of sales, of firm i for time period t.

4. Empirical Analysis

Table 1 reports descriptive statistics of all the variables during the study period, based on data of 25 firms in chemical sector. P/E ratio, demonstrates that on average investors are willing to pay Rs.7.2 for every Rs.1 of firm's earnings and median of Rs.7.9 shows that overall investors have confidence for investing in firms in chemical sector. Firms have an average dividend payout ratio of 31%, and percentile values depict that 25% firms pay no dividends, whereas, 25% firms pays more than 51%, thus justifying the high standard deviation of 50%. Leverage, indicates that on average firms heavily rely on debt (72%) for financing their activities. Market return, exhibits a mean value of 9%, with a high standard deviation of 55%. Highly volatile behavior of stock prices during the study period contributed to this high standard deviation. Descriptive for variability in market price and tobin's Q also confirm high volatility of stock market. Earnings growth depicts a mean value of 62%, as rising fertilizers prices and tight-supply demand conditions, boost up margins. Firm size on average is 6.07% large with a standard deviation of only 1.08% and percentile values show that 50% firms have a size larger than the mean, indicating that overall chemical sector have large size firms.

Variables	Mean	S.D	Percentiles		
			25 th	50 th (Median)	75 th
PE	7.204	18.07	1.099	7.970	12.70
DP	0.314	.5065	0.000	.0729	.5168
LEV	.7285	.7660	.4151	.5943	.7422
MktRtrn	.0973	.5524	-.1735	.0149	.2550
VMP	10.29	15.59	1.600	5.000	10.95
EGrowth	0.621	4.762	-.5654	0.000	.3896
Q	1.817	2.837	.5900	.8900	1.4850
Size	6.075	1.081	5.402	6.139	6.953

The correlation analysis is performed to examine relationship among all the variables during the study period. Table 2 illustrates the correlation coefficients; there is no multicollinearity in the data as all variables are having a correlation coefficient value less than 0.55. Results explain that P/E ratios of firms are positively associated with firm's earnings growth, payout ratio, market return, variability in market price and growth opportunities, whereas, negatively associated with leverage and size, which support the expected relationships. The highest significant positive correlation is found between dividend payout ratio and P/E ratio, indicating that high payout ratio raises investor's confidence to make investments in chemical sector firms.

	PE	LEV	MktRtrn	VMP	Q	DP	EGrowth	SIZE
PE	1							
LEV	-.162*	1						
MktRtrn	.072	-.126*	1					
VMP	.139*	-.155*	.116*	1				
Q	.083	.074	.059	.069	1			
DP	.550** *	-.134	-.013	.090	-.081	1		
EGrowth	.018	.384** *	-.026	-.048	.019	-.096	1	
Size	-.024*	-.221**	.045	.380** *	.158*	.128*	.302	1

*****, **, * are 1%, 5% and 10% significance level respectively.**

OLS Regression analysis is used to examine the effect of dividend payout ratio, earnings growth, Tobin's Q, leverage, variability in market prices, market returns and size on price-to-earnings ratios for chemical sector firms. Overall independent variables explain 33% variation in response variable, as depicted in adjusted R² and model is significant at 1% (0.000) level, having no serial correlation problem, as represented by D-W value of 1.94.

Table 3 reports the regression estimates by using pooled data analysis, based on 125 observations for 25 firms in chemical sector. Results show that dividend payout ratio, variability in market price, growth opportunities and size significantly explain variations in Price-to-earnings ratio. Dividend payout ratio demonstrates the highest explanatory power, indicating that investors are willing to pay high for those companies which pay large dividends to their shareholders. Aligned with White (2000), 1 % increase in DP leads to a 20 times increase in P/E ratio. Tobin's Q demonstrates significant positive effect on P/E ratio, which is in accordance with the results of Zarowin (1990) and Cho (1994) that firm's future growth opportunities are strong predictors of P/E ratios. Variability in market price also shows significant positive impact on P/E ratio, implying that investors prefer the shares of those firms whose market prices are highly variable in order to gain benefits of capital gains supporting results of Kumar and Warne (2009) for chemical industry of India. Size of the firm depicts significant negative impact on P/E ratio, reflecting that investors are more willing to invest in small firms confirming the results of Rolf Banz (1981) and Mark Reinganum (1981) who found that for NYSE small firm's stocks earned higher risk-adjusted returns than the large firm stocks.

Table 3: Regression Results by using pooled data Analysis			
Variables	Regression coefficient	t-statistic	p-value
DP	20.42	7.636	.000***
LEV	-2.82	-1.472	.144
MktRtrn	1.730	0.711	.478
VMP	0.149	2.165	.032**
EGrowth	0.406	1.309	.193
Q	0.562	2.049	.043**
SIZE	-3.172	-2.333	.021**
R² .adj	33%		
D-W statistic	1.947		
F-statistic	9.948		
Sig. of F	0.000		
***, **, * are 1%, 5% and 10% significance level respectively.			

Furthermore, estimated results indicate positive effect of earnings growth and a negative effect of leverage on P/E ratio, supporting of Ramcharran (2002), Jones (2000), and Beaver and Morse (1978). These results imply that high leverage increases financial distress cost resulting into a lower P/E ratio, whereas high earnings growth offset the risk effect, and leads to an increase in investor’s confidence and thus the price-to-earnings ratio. Finally, as expected, market return has a positive effect on price-to-earnings ratio, as firms with high market returns raise investor’s confidence to select these firms in their portfolios.

Considering high volatility in Pakistani stock market during the study period, a time-series analysis has been undertaken by using OLS regression model to examine whether determinants of P/E ratio differ across years and affect the investment decisions of investors or not?. Models for all five years are statistically significant at 1% and 5% level and D-W statistics indicates that no serial correlation problem exist in time-series analysis. Moreover, adjusted R² of time-series models are greater than adjusted R² reported for pooled data, indicating that explanatory powers of the variables in explaining variations in P/E ratios increase during the time-series analysis.

Estimated results reported in table 4, show that dividend payout ratio and Tobin’s Q are the most important determinants of P/E ratio, as their coefficients shows highest values and are statistically significant providing robustness to previous findings. Variability in market price depicts positive relationship with P/E ratio for

the first three years of study period, as KSE 100 index showed an upward trend through 2005, 2006, and 2007. During 2008 stock market has seen sharp decline and remained frozen for about four months i.e. 27th August 2008 to 12th December 2008, this downward variability of share prices dropped investor's confidence leading to an inverse affect of variability in market price on P/E ratios for year 2008. The coefficients for market return and Tobin's Q also shows higher coefficient values in explaining variations in P/E ratio up to 2007, and then significantly declined in year 2008 and 2009.

Table 4: Regression Results of cross-section analysis for Chemical Sector

Variables	2005	2006	2007	2008	2009
DP	13.29 (.059)*	21.96 (.052)*	19.75 (.001)***	4.59 (.007)***	12.76 (.002)***
LEV	-0.602 (.844)	-15.25 (.035)**	-15.91 (.091)*	-1.51 (.091)*	-3.68 (.319)
MktRtrn	2.38 (.784)	10.08 (.569)	17.91 (.027)**	4.81 (.022)**	1.82 (.237)
VMP	0.312 (.098)*	0.033 (.247)	0.143 (0.480)	-.012 (.803)	0.467 (.060)*
EGrowth	25.84 (.003)***	5.277 (.286)	-1.14 (.366)	0.628 (.150)	-1.11 (.091)*
Q	4.72 (.013)**	7.83 (.092)*	10.53 (.033)**	.276 (.291)	-7.60 (.024)**
SIZE	-2.74 (.213)	-10.55 (.094)*	-0.916 (.694)	5.06 (.000)***	0.315 (.728)
R ² .adj	0.70	0.36	0.62	0.69	0.42
D-W statistic	1.89	1.93	1.50	2.14	2.25
F-statistic	9.10	2.95	6.69	8.64	3.49
Sig. of F	0.000	0.032	0.001	0.000	0.016

***, **, * are 1%, 5% and 10% significance level respectively.

A negative relationship of SIZE with P/E ratio is found for the first three years of study i.e. 2005, 2006 and 2007, whereas sign turned to positive for the next two years i.e. 2008 and 2009. This implies that during the stock market growth, investors value more the shares of

small firms as they have growth opportunities but as the stock market start declining investors pull out their investments from small firms and prefer to invest in the shares of large and stable firms. The coefficients on leverage, as expected, remained negative for all the years and statistically significant for three years i.e. 2006, 2007 and 2008, implying that, firms which heavily rely on debt for financing their activities are least likely to be valued more by investors.

5. Conclusion

Understanding P/E ratio as well as the determinants of P/E ratio is of great importance to individual investors, fund managers, market analysts and decision makers, since equity valuation is very important for making investment decisions. High volatility in share prices and investment opportunities in firms of chemical sector of Pakistan motivated to empirically investigate firm-specific determinants of price-earnings ratio of the firms by using pooled and time-series analysis.

Empirical results using pooled data show that dividend payout ratio, variability in market price, growth opportunities and size significantly explain variations in Price-to-earnings ratio with dividend payout ratio as the most influential variable, indicating that investors are willing to pay high for those companies which pay high dividends to their shareholders. Investor's confidence for making investment is high for small firms with high growth opportunities. Similarly, investors prefer the shares of those firms whose market prices are highly variable in order to gain benefits of capital gains. Empirical findings of time-series analysis indicate that determinants of P/E ratio differ across years and affect the investment decisions of investors. The year 2008 is indicated as the worst year from investment point of view which is in accordance with the stock market's sharp decline in 2008 and freeze for about four months i.e. 27th August 2008 to 12th December 2008.

Current paper by examining factors explaining variation in P/E ratios, facilitates practitioners in identifying the significant factors that influence the corporation's P/E ratio of chemical sector, and helps in making investment decisions for building their portfolios. Corporations therefore, should pay high dividends to their shareholders in order to increase investor's confidence. Similarly, an increase in market return, earnings growths, Tobin's and decrease in leverage is required to attract investor's attention and raise their confidence to select these firms in their portfolios. Current study is limited to the analysis of determinants of P/E ratio of chemical sector, future research could be possible by identifying determinants of P/E ratio for other sectors of Pakistani stock market.

References

- Alford, A. (1992), "The Effect of the Set of Comparable Firms on the Accuracy of the Price-Earnings Valuation Method". *Journal of Accounting Research*, Vol.94, pp.94-108.
- Anderson, K., and Brooks, C. (2006), "Decomposing the Price-Earnings Ratio", *Journal of Asset Management*, Vol.6, No.6, pp.456-469.

Banz, R., (1981), "The Relationship between Returns and Market Value of Common Stocks", *Journal of Financial Economics*, Vol.12, pp.129-156.

Beaver, W., and Morse, D. (1978), "What Determines Price-Earnings Ratios?" *Financial Analysts Journal*, Vol.34, No.4, pp. 65-76.

Bodie, Z., Kane, Alex and Marcus, Alan, (2002), "Investment" 5th. Ed, McGraw-Hill Companies, INC.

Cho, Y.J. (1994), "DETERMINANTS OF EARNINGS-PRICE RATIOS: A REEXAMINATION", *Review of Financial Economics*, III(2), 105-120.

Dudney, D., Jirasakuldech, B., & Zorn, T. (2008), "Return Predictability and the P/E Ratio: Reading the Entrails", *The Journal of Investing*, pp.75-82.

Economic Survey of Pakistan, (2008-09), Finance Division, Government of Pakistan.

Gill, S., (2003), "Price-Earnings Ratio Revisited", *Finance India*, Vol. XVII, No. 3, pp 937-951.

Gordon, M., Shapiro, E., 1956, "Capital Equipment Analysis: The Required Rate of Profit", *Management Science*, Vol. 3, pp. 102-112.

Jones, C.P., (2000), "Investments: Analysis and Management", 7th ed. John Wiley & Sons Inc, New York.

Kane, A., Marcus, A., & Noh, J. (1996), "The P/E Multiple and Market Volatility", *Financial Analysts Journal*, Vol.52, No.4, pp.16-24.

Kumar, S., Warne, D.P., (2009). "Parametric Determinants of Price-Earnings Ratio in Indian Capital Markets". *The ICAI Journal of Applied Finance*, Vol.15, No.9, pp.63-82.

Loughlin, J.J., (1996), "Determinants of the Price-earnings Multiple for the Standard & Poor's 500 Composite Stock Index and the Effects of Determinants Volatility". Doctoral dissertation, St. Louis University, MO.

Molodovsky, N. (1953), "A Theory of Price-Earnings Ratios", *Financial Analysts Journal*, Vol.51, No.1, pp.29-43.

Muhammad, A., (2010), "Factors Influencing the Price-earning Multiples and Stock Values". *Interdisciplinary Journal Of Contemporary Research In Business*, Vol.2, No.5, pp.105-139.

Ramcharran, H., (2002). "An empirical analysis of the determinants of the P/E ratio in emerging markets". *Emerging Markets Review*, Vol.3, No.2, pp.165-178.

Reilly, F.K., Griggs, F.T., Wong, W., (1983), "Determinants of the aggregate stock market earnings multiple", *Journal of Portfolio Management*, Vol.1, No.1, pp.36-45.

Reinganum, M., (1981), "Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings Yield and Market Values", *Journal of Financial Economics*, Vol.9, pp.19-46.

Shamsuddin, A., Hiller, A.J., (2004), "Fundamental determinants of the Australian price-earnings multiple". *Pacific-Basin Finance Journal*, Vol.12, No.5, pp.565-576.

The Federal Bureau of Statistics, (FBS), Pakistan.

The Karachi Stock Exchange (Guarantee) Limited, Annual Report, (2008)

The Karachi Stock Exchange (Guarantee) Limited, Annual Report, (2009)

White, C. B. (2000), "What P/E will the U.S Stock Market Support?", *Financial Analysts Journal*, Vol.56, No.6, pp.30-38.

Zarowin, P., (1990). "What determines earnings price ratios: revisited". *J. of Acc. Audit. Finance*, Vol. 5, No.25, pp439-457