

# SELECTED FINANCIAL VARIABLES & THEIR IMPACT ON SHARE PRICE OF CEMENT & CONSTRUCTION COMPANIES LISTED IN KARACHI STOCK EXCHANGE, PAKISTAN

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**ABSTRACT** The current study investigates the return on asset and earnings per share impact on share price of cement and construction companies listed in Karachi stock exchange in Pakistan. Sample of 25 companies were selected due to non availability of data 2 companies were excluded and data were collected from the annual reports, balance sheet, profit & loss account, internet and Karachi Stock Exchange websites over the period from 2000 to 2013. For the empirical examination of hypothesis, descriptive statistics, multiple regression analysis with the help of Ordinary Least Square, panel data analysis with two models (i) fixed effect model and (ii) random effect model with the assistance of E-Views software applied. Results of the study shows that there were no autocorrelation, multicollinearity, hetroskedasticity among the variables and variables are normally distributed. OLS regression model shows that earning per share have a significant impact on share price and return on asset have insignificant impact. EPS jointly showed positive and significant impact on stock prices, whereas ROA found to be positive but insignificant in the cement and construction industry companies listed on the Karachi Stock Exchange.

**Key Words:** Earning Per Share, Return On Asset, Cement And Construction Sector, Karachi Stock Exchange.

## INTRODUCTION

Financial reporting is basically a process of producing statements that disclose an organization financial status to the investors, management, customers, stake holders and the government. It is mainly a practice to reveal financial performance and profitability of the firm over a particular time period. The organizations prepared a set of documents at the end of the accounting period from which investors and shareholders measure the short term and long term financial sustainable position of the organization [1].

For the fiscal year 2014-2015, the dispatches of Pakistan cement industry increased to 28.21 million tonnes compared to the previous year dispatches of 26.14 million tonnes indicating the growth of 7.89% in the local markets (Source: All Pakistan Cement Manufacturers Association [APCMA], 2015) . For the year 2014-2015, the exports from the country remains 7.20 million tones which were 8.16 million tones previous year.

Overall, the industry has shown positive growth compared to the previous year in the fiscal year 2014-2015 as the industry growth's has been increased by 2.5%. Similarly, cement and construction sector total dispatches stand approximately 33.4 million tonnes in the year 2014-2015 which were recorded as highest ever cement dispatches in the history of Pakistan cement sector, previously were 34.3 million tonnes annually. The domestic consumption for the cement was recorded 26.14 million tonnes for fiscal year 2014-2015. Large cement manufacturers, such as DG Khan Cement and Bestway Cement limited planning to expand their operations and agreed to establish new plants in the Karachi, Sindh to capture and meet the increasing demand of local and foreign construction work. Other cement producing companies are also setting up in expanding their capacities and distribution network to capture the domestic and export market share in the future. Such expansions will not only help the government to attract the foreign direct investment in the sector but also able to create revenue and employment in the country.

In Pakistan, the marketplace that is used by the buyers and sellers for the transaction of securities (stocks and bonds) is called stock exchange. These stock exchanges not only provide trading facilities to trade stocks and other securities for stock brokers and traders, but also have multiple roles such as mobilization of savings for in future investment, business growth facilitation, capital rising for expanding

business, opportunities for small investors and profit sharing [2]. In Pakistan, three stock exchange markets are functional.

## LITERATURE REVIEW:

[3] empirically examine the influence and relationship between the earnings per share (EPS) and return on assets (ROA) on the stock prices of coal mining companies listed in Indonesian stock exchange. [4] founded The impact of accounting variables on stock price: evidence from Colombo stock exchange, Sri Lanka and they used stock price (dependent variable), earning per share(EPS), dividend per share(DPS), book value per share(BVPS) independent variables. This research study used sample of 100 companies listed in Colombo stock exchange (CSE) and data were collected from annual reports from the year 2008 to 2012[5] conducted their research on Analysis of return on assets and earning per share on the stock market in the banking companies in Bursa EFEK Indonesia (Indonesia Stock Exchange). They used stock price, earning per share and return on asset as dependent and independent variable. Sample of 16 banks were used and secondary source of data used from the period of 2006- 2010. Sample of banks was collected from the banks listed in stock exchange. Further, the data was analyzed through F test, t test, multiple linear regression analysis and coefficient of determination test. [6,7] investigated the impact of return on investment (ROI), return on assets (ROA) and return on equity (ROE) on share prices of Jordanian insurance public limited companies. A sample of 37 listed insurance firms was used for conducting the research study during the period 2002 to 2007.

## MATERIAL AND METHODS

### Source Of Data and Sampling

This study work on selected financial variables impact on share price in cement companies in Karachi Stock Exchange and in this research study used secondary source of data. This research study covered period of 14 years from the period 2000-2013. For empirical analysis data will be obtained from annual reports, balance sheet of selected companies, internet, Lahore Stock Exchange and from the website of selected companies listed in KSE.

In this research study 25 construction and material (cement) companies are selected from the Karachi Stock Exchange (KSE-100 index) and name of these companies are given below:

Attock Cement, AKZO Nobak Pak ,Berger Paints, Buxly Paints ,Bestway Cement,Cherat Cement ,Dewan Cement ,Dandot Cement ,Fauji Cement, Flying Cement ,EMCO Industries ,Pioneer Cement ,Power Cement Ltd,Thatta Cement ,Zeal Pak Cement ,Shabbir Tiles

, Maple Leaf Cement ,D.G Khan Cements ,Fecto Cement ,Gammon Pak, sGharibwal Cement, Lafarge Cement, Karam Ceramics XD , Kohat Cement,Lucky cement.

**Target Population and Research Design & Tools**

The total numbers of companies listed in KSE-100 index are 36 construction and material companies. This research study focus only 25 construction and material (cement) companies listed in KSE-100 index. Due to non availability of data from internet and KSE 2 companies were excluded (Zeal Pak Cement and Lafarge Cement) and then total numbers of observed companies are 23 companies. In this research study descriptive statistics, multiple regression analysis with the help of Ordinary Least Square and OLS assumption test autocorrelation analysis, normality test, correlation analysis, heteroskedasticity analysis will be applied. Panel data analysis with two models; first is fixed effect model and second is random effect model with the help of E-Views software will be used for the investigation of hypothesis. Further more for selection of econometric model and to support the model Hausmen test, Lagrange multiplier and chow test will be applied in this research study.

**Econometric Model**

On the basis of review of the literature, the present research study will use the following model.

**Correlation Analysis & Regression Analysis Model:**

$$Y = \alpha + \beta_1(\text{EPS}) + \beta_2(\text{ROA}) + \epsilon$$

**Hypothesis**

The hypotheses of this research study are null and alternate hypothesis and as follow:

H0: There is negative relationship between earning per share and share price of construction and material (cement) companies.

H0: There is negative relationship between return on asset and share price of construction and material (cement) companies.

H1: There is positive relationship between return on asset and share price of construction and material (cement) companies.

H1: There is positive relationship between earning per share and share price of construction and material (cement) companies.

**RESULTS AND DISCUSSION**

**Table 4.1 – Descriptive Statistics**

	EPS	ROA	SP
<b>Mean</b>	1.72	0.48	46.60
<b>Standard Error</b>	0.31	0.16	2.65
<b>Standard Deviation</b>	5.52	2.95	47.61
<b>Kurtosis</b>	8.02	7.60	9.64
<b>Skewness</b>	1.26	1.03	2.05
<b>Minimum</b>	-25.10	-10.14	2.00
<b>Maximum</b>	33.82	27.08	376.00

The last two columns in the Table 4.1 show the minimum and maximum values of the ROA, EPS and SP. The minimum value of share prices in the cement and construction sector remains PKR 2.00 where maximum a share price of the firm for the period 2000 to 2013 is PKR 376.00. Similarly, the minimum value of earnings over the time period remains -25.10 and maximum is 33.82. Also, the minimum value of the return on assets is -10.14 for the selected companies and the maximum value is 27.08 for the time period 2000 to 2013. The significance level used for this study is 0.05.

**Regression Analysis**

The impact of return on assets and earnings per share jointly on firm’s stock price is estimated through the following multivariate regression model (A):

As this study aims at examining the effect of financial performance such as EPS and ROA on share prices, with emphasis on cement and construction listed companies separately and jointly. Following econometric models and analytical techniques has been applied to achieve the desired results.

- Descriptive Statistics
- Regression Analysis – Ordinary Least Square (OLS) Regression Model
  - Autocorrelation Analysis
  - Multi-Co linearity (Correlation) Analysis
  - Normality Test
  - Hetroskedasticity Analysis
- Panel Data Analysis
  - Fixed Effect Model
  - Random Effect Model
- Hausmen Test, Chow Test and Lagrange Multiplier (to support model selection)

**Descriptive Statistics**

The Table 4.1 explains the descriptive statistics of the dependent and independent factors consider for the study. It shows the descriptive statistics of all three variables (EPS, ROA and SP) consider for the study. The mean value of the EPS is 1.72, ROA is 0.48 and SP mean value is 46.60. EPS standard deviation is 5.52, ROA have standard deviation of 2.95 and SP with standard deviation value of 47.91 respectively. Standard error of the mean also depicts the same findings as that of variance. EPS, ROA and SP all have very low error values, so it means that the data has no major issue with respect to the outliers. Skewness and Kurtosis values show the deviation in the variables value. A variable with skewness near to zero or equal to zero has a normal distribution. As the value of all variables is near to zero, which means that data is normally distributed. Similarly, a normal distribution has kurtosis value three. Extremely non normal distributions may have high positive or negative kurtosis values, while nearly normal distributions have kurtosis values close to three. Only share price shows somewhat high kurtosis value compared to other two variables.

$$SP_{i,t} = \beta_0 + \beta_1EPS_{i,t} + \beta_2ROA_{i,t} + \epsilon_{i,t} \dots\dots (A)$$

Whereas, the individual impact of earnings per share and return on assets is shown in model (B) and (C).

$$SP_{i,t} = \beta_0 + \beta_1EPS_{i,t} + \epsilon_{i,t} \dots\dots (B)$$

$$SP_{i,t} = \beta_0 + \beta_1ROA_{i,t} + \epsilon_{i,t} \dots\dots (C)$$

In the above given models, SP is taken as a measure of firm stock price, ROA is the return on assets, EPS is earnings per share,  $\beta_0$  is constant term and the  $\beta$  is coefficient of variables and  $\epsilon$  is the error term.

Now to assess that panel data regression model with the assistance of E-Views software, one has to fulfill the following regression model assumptions for the model (A).

**Multicollinearity Test:**

	SP	EPS	ROA
SP	1.000		
EPS	0.507	1.000	
ROA	0.011	0.106	1.000

In the linear regression model, there is an assumption that no multicollinearity (correlation) should exist between all of the variables. For this purpose correlation matrix is used to scrutinize the existence of multi-collinearity among the dependent and independent variables in the study. If value of Variance Inflation Factor (VIF) exceeds 10, then there is a problem of multi-collinearity in the model, otherwise no issue of multi-collinearity exists among the variables. Table 4.2 shows the Pearson correlation (multi-collinearity) test of all the

F-statistic	240.079	Prob. F(2,312)	0.000
Obs*R-squared	109.548	Prob. Chi-Square(2)	0.000
Durbin-Watson stat	1.858		

As the p-value of the Breusch Godfrey Serial Correlation LM test is below the 0.00, so we fail to reject the null hypothesis that there is no autocorrelation among the residuals of the variables. Similarly, the value of Durbin-Watson test indicates no autocorrelation among the residuals of the variables as discussed already in the Table 4.3 since the value is close to 2 and the resulted F-statistic shows model is statistically significant at 95% level of significance.

**Normality Test**

The data of each independent variable that I use amounted to 322 objects each observation, referring to one of the rules of the Central Limit Theorem, then the data can be categorized as data are "sufficiently large" and can be considered normally distributed. Based on the results obtained the data processed PP plot description as below:

H<sub>0</sub>: There is no heteroskedasticity

H<sub>1</sub>: There is a heteroskedasticity

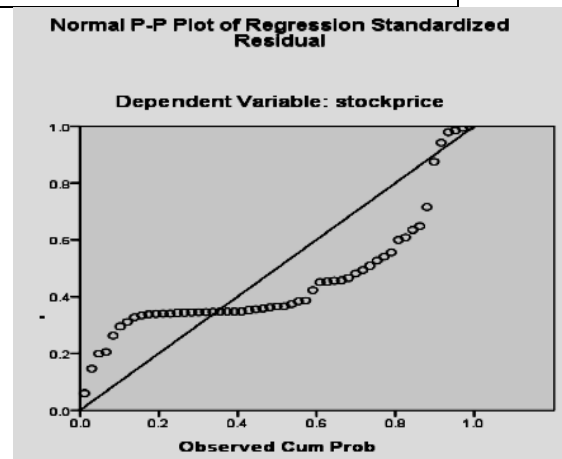
variables used in the study. The test indicates the absence of multicollinearity problem among all the factors, which means that all the factors taken in to study have no interdependency on each other and free from the issue of correlation of explanatory variables.

**Variance****Autocorrelation Test:**

To determine whether association exists between residuals or not, Breusch Godfrey Serial Correlation LM (Lagrange multiplier testing) test and Durbin Watson test is exercised. The Lagrange multiplier test for autocorrelation states the null hypothesis as that there is no serial autocorrelation of any order in the residuals. Similarly, the value of Durbin Watson also indicates the absence or presence of autocorrelation among the variables. The Durbin Watson value statistics ranges from 0 to 4, whereas the value close to the 2 indicates an existence of the non autocorrelation.

H<sub>0</sub>: There is no autocorrelation

H<sub>1</sub>: There is an autocorrelation



**Figure 4.1: P-P Plot Normality Test**

F-statistic	1.140	Prob. F(2,313)	0.321
Obs*R-squared	2.285	Prob. Chi-Square(2)	0.319
Scaled explained SS	9.243	Prob. Chi-Square(2)	0.009

From the Figure 4.1 shows that the scattered dots are interconnected to form a pattern that follows the diagonal line. From the picture it does not look too out of the pattern variables (outlier), so the researchers assume that the data used in this study were normally distributed.

**Heteroscedasticity Test:**

To find out either residuals are homosekedastic or not, Breusch Pagan Godfrey test had been applied. The results of the test are shown in the Table 4.4. The null hypothesis for conducting the Breusch Pagan Godfrey test is that there is a no heteroskedasticity among the residuals, whereas alternative hypothesis is that there is a heteroskedasticity between the residuals, that is

The above table depicts that both the F test and the LM (Obs \* R-squared of the auxiliary regression) conclude for the acceptance of null hypothesis, as the p-values are above level of significance of 0.05. This means the null of homoskedasticity in the regression model.

**Ordinary Least Square (OLS) Regression Model**

To measure the impact of EPS and ROA on the share price of the cement and construction sector companies, one of the models that are applied is OLS regression model. The estimated regression model is as follow:

$$SP = 39.356 + 6.297EPS + 0.892ROA$$

Table 4.5 shows the results of OLS regression parameter estimates of all the independent variables that were consider to check the impact on dependant variable for the research study. The p-value of earnings per share (EPS) at 5% level of significance is less than the 0.05, which means that EPS have a significant impact on the share prices (SP). However, the return on assets (ROA) variable is insignificant and had no impact on the SP of the cement and construction sector companies as its p-value is greater than the alpha value of 0.05, that is, ROA p-value = 0.392 is greater than alpha value of 0.05 at the 95% level of confidence.

	<b>Coefficients</b>	<b>Standard Error</b>	<b>t stat</b>	<b>P - value</b>
Intercept	39.356	2.418	16.271	0.000
EPS	6.297	0.537	11.707	0.000
ROA	0.892	1.041	0.856	0.392

Multiple R	0.509
R Square	0.259
Adjusted R Square	0.254
Standard Error	41.117
F-statistics	55.729
Prob (F-statistics)	0.000

This significant relationship among dependent and independent variables can also be explained and verified by looking at the t-statistics column in the Table 4.5. In statistics, the rule of thumb for checking the t-statistics value is that if value of t-statistics is less than -2.32 or greater than +2.32, it means the variable has a significant impact on the dependent variable at the 95% of confidence and vice versa. The variable ROA has a t-stat value of 0.856 within the range (-2.32 to + 2.32) indicating an insignificant relationship with the share price (SP), while EPS have t-stat value 11.707, that is greater than +2.32 resulting in the significant association with the SP. The results of t-stats are also consistent with the p-value of the OLS model. To determine the direction of impact that regressors possess on regressand is indicated by the value of regression coefficients. Regression coefficient of EPS is 6.297 (and

ROA is 0.892) which means that 1 unit increase in EPS (or ROA) may increase the SP by 6.297 (or 0.892) keeping other variables constant. This shows that EPS and ROA have positive impact on the share prices.

The Table 4.6 summarizes the regression statistics. A total of 322 observations used in regression analysis. Fitness of regression line is measured through the value of R-square. It measures the strength of association between the variables. Explanatory power in regression model is 25.9 % which means that 25.9 % variance from total variation in share price is due to earnings and return on assets used whereas remaining 74.1 % is explained by other factors which are not taken in current research study. Standard deviation of error term is high indicating not a good strength of our regression estimation. The result of regression model also reveals that model is significant as its F value is 0.000 which is less than the level of significance of 0.05.

#### **Panel Data Analysis**

Table 4.7 and Table 4.8 represent the results of panel data analysis of the fixed and random effect model. The total number of observations in the model is 322. For panel regression analysis with the assistance of E-Views software, this investigation administered two momentous models before applying Hausman test, the first model is Fixed effect model (Table 4.7) and the other model is Random effect model (Table 4.8).

#### **Fixed Effect Model**

The findings of fixed effect model are shown in the Table 4.7.

Dependent Variable: SHAREPRICE				
Method: Panel Least Squares				
Sample: 2000 2013				
Total panel (balanced) observations: 322				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
C	41.23888	2.064317	19.97700	0.0000
EPS	2.597931	0.386700	6.718202	0.0000
ROA	0.276266	0.704574	0.392103	0.6953
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.526061	Mean dependent var	46.6016	
Adjusted R-squared	0.487763	S.D. dependent var	47.6149	
F-statistic	13.73594	Durbin-Watson stat	1.60499	
Prob (F-statistic)	0.000000			

Since the results of fixed effect demonstrated that overall model is good fit because the F - statistics value is below 0.05 level of significance (i.e. 0.000) and the value of R Square ( $R^2$ ) is 0.526 or 52.6 % which draw attention to 52.6 % of the diversity in companies share price value due to earnings per share and return on assets, while the remaining variation in share prices is unexplained and could be resulted by the other financial variables that are not taken in to consideration for this study. The estimated regression model is as follow:

$$SP = 41.238 + 2.597EPS + 0.276ROA$$

#### **Relationship between EPS, ROA and SP**

The Table shows that the EPS and ROA have a positive relationship with the SP of the cement and construction firms at the 95% level of confidence. The EPS depicted a significant relation with the SP of

the cement and construction sector firms and statistically the coefficients are positively affected by the SP. Similarly, a positive relationship is found between the ROA and SP with coefficient being statistically insignificant at 5% level of significance. The p - value of earnings per share (EPS) at 5% level of significance is less than the 0.05, which means that EPS have a significant impact on the SP. However, the return on assets (ROA) variable is insignificant and had no impact on the SP of the cement and construction sector companies as its p-value is greater than the alpha value of 0.05, that is, ROA p-value = 0.392 is greater than alpha value of 0.05 at the 95% level of confidence.

This significant relationship among dependent and independent variables can also be explained and verified by looking at the t-statistics column in the Table 4.10. In statistics, the rule of thumb for

checking the t-statistics value is that if value of t-statistics is less than -2.32 or greater than +2.32, it means the variable has a significant impact on the dependent variable at the 95% of confidence and vice versa. The variable ROA has a t-stat value of 0.392 within the range (-2.32 to +2.32), while EPS have t-stat value

6.717, that is greater than +2.32 resulting in the significant association with the SP. The results of t-stats are also consistent with the p-value of the OLS model.

Dependent Variable: Share Price (SP)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	41.23888	2.064317	19.97700	0.0000
EPS	2.597931	0.386700	6.718202	0.0000
ROA	0.276266	0.704574	0.392103	0.6953
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.526061	Mean dependent var	46.6016	
Adjusted R-squared	0.487763	S.D. dependent var	47.6149	
S.E. of regression	34.07841	Akaike info criterion	9.96966	
Sum squared resid	344917.5	Schwarz criterion	10.2627	
Log likelihood	-1580.116	Hannan-Quinn criter.	10.0866	
F-statistic	13.73594	Durbin-Watson stat	1.60499	
Prob (F-statistic)	0.000000			

The fitness of regression line is measured through the value of R-square. The R square value explained 53 percent variation in the SP is explained by the independent variables. The statistics also divulged that overall model is good fit because the significance level or Probability (F - statistics) is below 0.05 (i.e. 0.000). Standard deviation of error term is quite high (yet less than simple regression model) indicating a good strength of the estimation.

#### Summary of the Results

The study found earnings per share as the dominant financial factor in the cement and construction sector that had high influence on the companies' stock prices. It can be concluded that the performance of business in managing its asset to produce profit is significant in explaining the price of the stocks of the selected cement and construction sector during the period of investigation. These findings are consistent with prior studies. By observing the level of EPS, investor or market analyst can compare the stock which is more profitable. The study also found that Fixed effect model best fitted with the data results compared to OLS regression or Random effect model. The main findings of the analysis are as follow:

Hypothesis of Study	Acceptance/ Rejection	Relationship Direction
H <sub>a1</sub> : There is a significant relationship earnings per share (EPS) and share price (SP) of cement and construction sector companies.	Accepted	Positive
H <sub>a2</sub> : There is a significant relationship return on assets (ROA) and share price (SP) of cement and construction sector companies.	Rejected	Positive
H <sub>a3</sub> : There is a significant impact of ROA and EPS on share price (SP) of cement and construction sector companies.	Accepted	Positive

#### CONCLUSION

This study aimed to examine the effect of Earnings per shares (EPS) and Return on assets (ROA) to the stock price on cement and construction sector companies listed on the Karachi Stock Exchange. Based on the description and discussion of the analysis of the testing that has been done, it can be concluded as follows: EPS partially significant effect on stock prices on the cement and construction sector company's listed on the Karachi Stock Exchange. This is evident from the results of the model calculations of fixed effect model that demonstrate the value of the t-statistic of 6.718 with variable, EPS probability level of 0.000 is greater than the value of t-table of 1.96 at 5 percent level of significance.

- ROA partially no significant effect on the stock price on the cement and construction sector company's listed on the Karachi Stock Exchange. This can be seen from the calculation of the fixed effect model which shows the t-statistic value of 0.392, ROA variable with a probability level of 0.695 is smaller than t-table of 1.96 at 5 percent level of significance.
- EPS jointly showed positive and significant impact on stock prices, whereas ROA found to be positive but insignificant in the cement and construction industry companies listed on the Karachi Stock Exchange.
- From all models used in this research, the highest R<sup>2</sup> is only 52.1%. It suggests that there is other information other than internal fundamental factors that also affect the movement of company's stock price.
- The study also found that Fixed effect model best fitted with the data results compared to OLS regression or Random effect model. Based on the results of the selection of the best model among the models of Ordinary least square (common effect), Fixed effect model, and Random effect model, obtained the best model is the model of Fixed effect with the following regression model:  

$$SP = 41.236 + 2.59EPS + 0.276ROA$$
- Referring to the constant value of the variable EPS and ROA, the EPS and ROA has a positive effect on stock price. The positive influence of EPS on the stock price in line with the results of research conducted by [6] ROA associated positive influence on stock price; the results of this study are consistent with research conducted by

- These finding are also consistent with prior studies. By observing the level of EPS, investor or market analyst can compare the stock which is more profitable

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