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An Analysis of the Role of Stock Prices and Risk and Return Relationship in Investment Decision Making in the Cement Industry in Pakistan

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ABSTRACT

This research study aims to find out the role of stock prices in investment decision making the cement industry of Pakistan. This study uses the data from the six companies. We analyze the individual company data using Markowitz portfolio selection mode. The analysis shows that there is positive relationship between value of return and the current years stock prices. The research that the Attock Cement Company performed best among the selected companies based on the risk and return relationship. We also found a statistically significant positive relationship between risk and return.

INTRODUCTION

1. Background of the Study

The main objective of an investor is to maximize a return on their investment. Investors operate in a risky environment and their returns are affected by the level of risk. The gap between the expected and actual return has been generally attributed to the existence of risk (Javid, 2008). The investors are faced with decisions such as whether to invest their funds in stocks, bonds, money market securities or to make a portfolio of various investments. There is trade off involved in expected rerun and a risk (Putrasemadhi, 1997). Investors look at the mixture of "same return with a low level of risk" or "high return with a same level of risk". Thus, risk and return are used to evaluate different investments.

Investors are usually risk averse. In general some securities and assets are much riskier than others and usually those provide a high level of return (Javid, 2008). Markowitz portfolio selection model uses standard deviation to measure the variability in stock prices.

Investors before making an investment in a certain stock evaluate the "historical performance" of each individual stock. Evaluation of "historical performance" of a certain investment determines the price fluctuation of stocks/securities and thus helps in deciding whether to invest in that stock. Cement industry in Pakistan has been showing a growth. This study looks at the impact of variation in stock prices and how risk affects the returns and ultimately the investment decision making in the cement industry.

2. REVIEW OF THE RELATED LITERATURE

Soldofesky and Miller studied a broad spectrum of securities by looking at their risk and return. They calculated a return on a one year holding of seventy five common stocks. They found that those stocks that have a high level of return had a high level of risk and vice versa. Similarly, Markowitz (1952) reported that investors looks at the risk and return when making an investment decision and the relationship between them determines portfolio risk and return. Risk is distributed in various securities when investment is done in a portfolio.

Basu and Sanjoy (1977) studied a relationship between the performance of the investment in equity securities and their price to earning ratio. By examining securities price over a 14 years, they found a positive relationship between investment performance of the equity stocks/securities and the

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price to earnings. Amihud et al. (1992) did not find a significant relationship between the "systematic risk" of common stock and average return. Lawrence et al. (1993) found a negative relationship between the conditional variance of monthly return and conditional monthly return. Risk and return of different stocks at different periods of times are usually different (Hawawini and Keim, 1997).

John and Billson (1998) assessed the significance of market value and the book to market ratio as an important forecaster of average returns and found that the beta (overall risk of market) is not an important forecaster.

According to Ahmad and Zaman (1999) in their study using a monthly sectoral data for the period from July, 1990 - March 1997, found a highly significant positive relationship between high risk and return.

Macalli (2002) analyzed efficient portfolio and measurement of risk and returns through standard deviation as a measure of risk and expected shortfall. Giorgi, Hens, and Mayer (2002) collected stock portfolio data and annual real returns from Jan 1927- Dec 2002 from the online data library of Kenneth French's. They ranked the assets for investment in the following order: (i) cash, (ii) bonds, and (iii) stocks. They found that the ratio of bond and stock goes up in the portfolio with an increase in the risk.

Hussien (2007) reported that the historical performance of the firms stocks, marketability of stocks, holding of government securities and the formation of the planned and organized financial markets are the main considerations for making investment decisions.

Psychology of different investors change the image of financial markets and investors are not always capable to properly asses and evaluate the utilization of different investment alternatives (Adem, 2008).

Ahmad and Javid (2008) using closing price data of different companies for five years, determined the dividend per share (DPS), capital gain and returns of individual companies. They also determined standard deviation as a measure of risk, average return and "covariance" for individual companies for developing a portfolio of investment.

3. MATERIAL AND METHODS

Stock prices are used as a proxy for evaluation of the risk and return for individual stocks as well as portfolio of stocks. The objective is to assess the role of the risk measured in terms of standard deviation on the return from the stocks.

Risk in absolute terms is measured as a difference between expected return and actual return. Every investor and individual wants to invest money somewhere for the purpose to gain return.

Research Hypotheses

In this research we test the following hypotheses:

H01: There is no influence of stock prices on investment decision making.

H02: High risky securities have low level of return.

All companies in the Pakistani Cement Sector/Industry which are listed in "Karachi Stock Exchange" comprise the population for this study. Of all the companies, six were selected randomly for this study over period of 2003-2013.. The stock prices data were collected from the business recorder and annual data of the selected companies. Returns of individual companies were calculated, and comparison of the variations in stock prices were performed. Companies' data like face values of shares and percent dividends were collected from the annual reports of the companies.

Markowitz portfolio selection model (1952) was used to find out return and risk for individual companies. Coefficient of variation was also calculated to determine portfolio risks and returns. The following general measures of the investments were calculated using the formulae as under:

$$Capital\ Gain\ formula = {(P_0 - P_1)}/{P_1}$$ Where

P_0 is the current year price of a stock
P_1 is the previous year price of a stock

$$Dividend\ per\ share = {(dividend \times face\ value)}/{100}$$

$$Return\ of\ individual\ stock = {(P_0 - P_1) + Dividends\ per\ share}/{P_1}$$

$$Expected\ Return\ of\ portfolio = E(R_P) = W_1 E(R_1) + (1 - W_1)\, E(R_2)$$

Where

W1 is weight (proportion of investment) assigned to stock 1

W2 = (1- W1) is weight (proportion of investment) assigned to stock 2

$E(R_1)$ = represents the stock 1 expected return.

$E(R_2)$ = represents the stock 2 expected return.

$E(R_p)$ = represents the portfolio expected return.

4. RESULTS AND DISCUSSION

We first analyze the individual companies and then a portfolio. We apply both descriptive statists and regression analysis. We begin this section by analyzing the individual companies' financial data and how risk and returns are associated.

The relationship between risk and returns for the six companies for the period 2003-2013 is given Table 1. Further, table 1 provides a summary of the individual
company's overall stock prices, maximum and minimum level of stock prices and average and standard deviation of risk and return.

Attock Cement Company seems to perform best on the return/risk ratio. There has been more fluctuation in the stock prices of the Attock cement company which needs more analysis to study various reasons for it.

Table 1. A Summary of Descriptive Statistics of the Selected Companies.

		Stock Prices					Returns					
S.No	**Company Name**	**Min**	**Max**	**Range**	**Average**	**St. Deviation**	**Min**	**Max**	**Range**	**Average**	**St. Deviation**	**Return/Risk**
1	Bestway cement	8.40	71.00	62.60	38.40	20.10	-0.60	2.72	3.32	0.38	1.01	0.37
2	Fecto cement	3.90	62.85	58.95	24.06	17.85	-0.52	8.10	8.62	0.97	2.64	0.37
3	Attock cement	35.70	142.63	106.93	71.92	31.89	-0.60	1.12	1.72	0.33	0.49	0.67
4	Cherat Cement	7.21	88.25	81.04	40.83	27.82	-0.71	6.03	6.74	0.55	1.97	0.28
5	*Dewaan Crement*	1.20	18.40	17.20	6.35	5.41	-1.00	3.04	4.04	0.31	1.10	0.28
6	D.G Khan Cement	19.03	106.60	87.57	55.38	29.83	-0.77	1.94	2.71	0.32	0.78	0.41

Portfolio Analysis of the selected companies

Table 2 and figure 1 provide a portfolio of the selected companies. Different weights of investment are assigned to each company and different combinations of risk and returns are determined. The analysis shows the risk and return relations for the selected companies. The table shows that the Best Way Company performs best in terms of return/risk ratio which is 0.508 with 0.385 return, and 0.757 risk. The correlation between risk and return was determined to be 0.983 indicating a strong relationship between the risk and return.

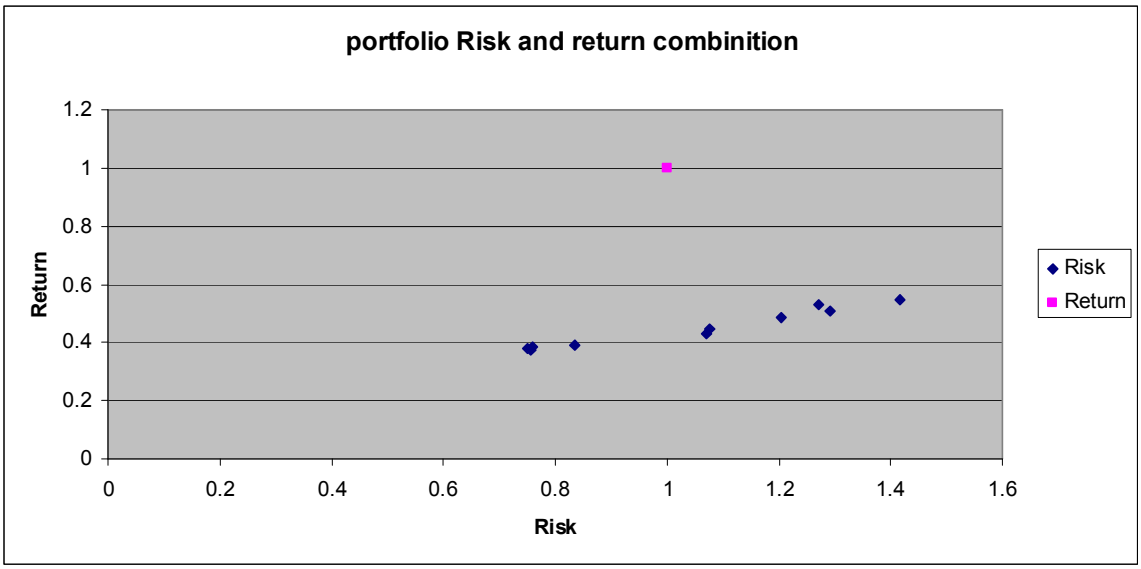
We also find that the maximum portion of investment goes to Attock Cement Company and the combination of returns and risks is high. We also find that for the Attock cement company majority of returns are positive due to increase in its stock prices. Our analysis indicates that the fluctuation in

stock prices has an impact on returns of companies' performance, and the investor can make the decision of investment for their funds by using the historical stock prices and making the portfolio of investment by the determination of efficient portfolio.

Table 2: Portfolio Analysis of the selected companies

Best Way	Fecto	Attock	Cherat	Dewan	D.G. Khan	Std deviation	Return	Return/Risk
0.1	0.05	0.5	0.07	0.03	0.25	0.749	0.380	0.507
0.1	0.06	0.4	0.1	0.07	0.27	0.834	0.392	0.470
0.2	0.13	0.3	0.2	0.12	0.25	1.271	0.529	0.416
0.25	0.12	0.2	0.3	0.13	0.2	1.417	0.548	0.386
0.05	0.05	0.6	0.1	0.1	0.1	0.757	0.385	0.508
0.2	0.2	0.1	0.1	0.1	0.3	1.204	0.486	0.403
0.4	0.1	0.1	0.1	0.1	0.2	1.070	0.432	0.403
0.2	0.2	0.2	0.2	0.1	0.1	1.290	0.510	0.395
0.05	0.05	0.4	0.05	0.05	0.4	0.757	0.371	0.490
0.2	0.1	0.3	0.2	0.1	0.1	1.075	0.446	0.414

Figure 1: Relationship between Risk and Return



Regression Analysis results

In this study we estimate the impact of the risk on the return from the selected companies using ordinary least squares (OLS) method. The relationship between the risk and return shows that there exist a positive relationship between them and the effects is highly statistically significant. The overall model a good fit as shown by the R^2 value of 0.966 which shows that 96.6% variation is explain by the explanatory variable "Risk" in the return from the selected companies.

Table 3: Estimation of the impact of risk on return of the selected companies from 2003-2013

Variables	Coefficient	Standard error	t-ratio
Constant	0.178	0.018	9.651
Risk	0.259	0.017	15.021

5. Conclusion

The research was carried out on the role of stock prices in investment decision making and to investigate the impact of the risk on return in the cements industry of Pakistan. It has been found that the return is highly determined by the increase in stock prices of the companies. It has also been shown that there exists a high degree of correlation between the risk and return. Knowledge of the historical stock prices and a relationship between the risk and return helps the investors to invest wisely either in a single investment or a portfolio of investment. Furthermore, the role of other factors rather than just the stock prices in investment decision making needs to be explored to gain further knowledge into the investment decision making.

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