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Khan, Dr. Muhammad Irfan and Syed, Muhammad Salman

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## **Comparison between Forecasted Stock Prices and Original Stock Prices in the Karachi Stock Exchange**

Muhammad Irfan Khan, Syed Muhammad Salman  
Iqra University Main Campus, Karachi Pakistan  
[mirfan@iqra.edu.pk](mailto:mirfan@iqra.edu.pk), [smsalman@iqra.edu.pk](mailto:smsalman@iqra.edu.pk)

### **Abstract**

Stock price forecasting is certainly a significant aspect to an investor which enables him to invest or to retain its equity. The aim of study is to determine the efficiency of two different security companies i.e. FDM and Magnus and compare its forecast with the original market prices. By applying the paired sample t – test and correlation analysis we found that there is a significant difference observed in the forecasted prices of both the companies but on the other hand, we found a significant correlation between the forecasted prices by the two companies which lead to the conclusion that these two firms can better forecast the increase or decrease in the market prices but as far as the accuracy is concerned, paired sample t –test showed that the firms have shown lacking while predicting the accurate prices

**Keywords:** Forecasting, Risk Analysis, Stock Prices, Correlation, Paired Sample t-test

### **Introduction**

The economy of Pakistan is in its developing phase. The stock market is not as developed as in other developed economy but exhibit meaningful results to conclude the economic position of the county. Stock prices are predicted by different brokerage firms in Pakistan based on the information they possess. In most of the cases these prices are more or less similar. This may be a situation where brokerage firms have a synergy so that they predict the same prices of a particular stock. Under these circumstances, stock prices will not incorporate all available information and

forecasting will involve biases. This study intends to explore this aspect of the phenomenon. The objective of the study has three folds. First, it is aimed at finding not only the correlation between the forecasted stock prices by the two firms i.e. FDM and Magnus but also between forecasted stock prices by the two firms and the actual stock prices. Secondly, it intends to statistically explore the mean differences between the forecasted stock prices of the two brokerage firms. Thirdly, the study exhibits the statistical differences in the forecasted stock prices of these firms and the actual stock prices at a particular time period. Based on above discussions, following hypotheses are being developed.

**Hypothesis 1:** There is a correlation between forecasted stock prices of the two security companies.

**Hypothesis 2:** there are no differences between the forecasted stock prices of the two said firms.

**Hypothesis 3:** there are no differences between the forecasted stock prices by FDM & Magnus and original stock price.

Table 1 in the appendix shows the name of companies, alongwith number of observations in each period. The sample companies belong to two different sectors like Oil & Gas and FMCG as both have demand in the market as compared to others. Because of oil and gas shortage in the country, the demand has increased hence trading enhanced. Similarly, FMCG is also considered as one of the major sectors providing higher return because of higher trading. The current study covers the period from 2005 to 2012. All the predicted stock price data was collected by visiting the brokerage firms. Actual stock prices were taken from the website of KSE.

### **Literature Review**

Geert & R. (2009) used a linear factor model to analyze the co-movements of international assets.

The risk loadings and the concerned factor structure changes every half year which according to

him is certainly important to determine the time varying market integration. Further, he discussed the standard Heston-Rouwenhorst dummy variable model which did not support his study and provided insignificant results for the stock market co-movements. Cristi & Christi & Charles (2003) followed a large sample of forecast revision from individual firms and resulted that the magnitude of post revision prices depends on the characteristics of various firms. Initially, they tested the delayed price response and found that it is a function of quantity of revisions i.e. higher good news revisions for a firm leads to positive subsequent returns in comparison to the firms having bad news. Pu et.al (1990) put a significant impact on the stock prices. Abnormal returns were observed on the event day and even from 2 days before and the cumulative abnormal returns (CAR) for this time period were found to be 3.09%. Breaking the average CAR shows that for single – company it was 5.11% and that for multi – company, it was 2.39% respectively and was statistically significant. They concluded that HOTS significantly affects the market and therefore, trading volume being certainly affected. They proposed two major reasons for this higher trading volume i.e. the initial reason of HOTS and secondly they enforced that the other dimension cannot be underestimated that the advance trading between the investors may might had taken place.

Cristi & Charles (2003) further explains that revision quality significantly help in capturing the returns price responses. From this conclusion, it can be analyzed that there are variations in the forecasted prices of analysts as some are waiting for the event to occur and some presumed that the particular even will occur. Similarly, they found out that delayed price responses of forecasting revisions used by a few analysts and most often, the event occurring usually included in the forecast. The combined conclusions made by them was that number of revision in the forecasted prices sometime create negative impact on the sign of prices of stock returns.

Grace, Charles & Gregory (1993) studied the effect of stock prices due to management earnings forecasts. In the study, authors focused on various aspects which include the fact that forecasts have information content and particularly leading to the conclusion that management earnings forecasts are found to be comparatively less informative as compared to earnings announcements. Further, a qualitative study by Battalio, Andrew & Robert (2007) showed that floor brokers that have maintained a relationship with the in house specialist, obtained a better execution of prices as compared to those who have terminated their relationships. This is the reason that according to them out house brokers work on trading after the event has occurred which is contrary to that done by the specialists. Xavier et. al (2006) presented valid explanations regarding the volatility in stock markets in an excess amount. They have shown that these movements of high volatility in stock market are due to the trading volumes exchanged by very large institutional investors even in the illiquid markets. Their conclusion is that these high trading volumes create significantly higher spikes in volumes and returns even there is no important news or event to occur forecasted by financial institutions.

### **Data and Estimation Techniques**

From the research objectives, the study intends to determine the correlation and differences between forecasted stock prices by security firms of 5 oil & Gas companies and 5 FMCGs of Pakistan and their original prices. There are two benchmarks security companies which have been taken to analyze the comparison between the forecasted prices of the two securities firms i.e. FDM securities and Magnus Securities. The comparison between the forecasted prices will let us know the best security company to invest which could be determined through the closeness of the forecasted and original stock prices. A total of 10 companies have been taken in the study with almost 5 years daily data for each company from 2005 to 2012. The number of observations for each company is not same because of unavailability of data. However, the forecasted stock prices

for the securities are taken according to the availability i.e. prices are only taken for those days in which the forecasted data was available. In Pakistan, we face a significant problem that stocks which are not sold and purchased in large volumes are not usually forecasted by the security companies to a great extent. This is the reason that the sample size of rarely selling shares is significantly lower than that of the frequently selling and buying shares. Another problem is to collect the data because the data is not publicly available. We had to make several visits to not only collect but screening the raw data.

### **Results and Analysis**

We start the analysis with comparison of mean of forecasted stock prices of the two companies.

We conduct a correlation analysis to determine correlation between the forecasted stock prices of the two stock companies i.e. FDM securities and Magnus Securities as well as with actual stock prices. Finally, to determine the differences between the forecasted and original stock prices, we used paired sample t – test which helps us analyzing the differences between the forecasted and original stock prices significantly. Since the descriptive analysis is not part of the hypothesis of the study, we put this table in the appendix for ready reference.

Table 2 in the appendix shows the descriptive analysis of mean forecasted stock price of FDM and Magnus securities which are significantly close to each other with [M = 140.66, SD = 56.41] of FDM and [M = 139.53, SD = 56.05] of Magnus for Attock Refinery respectively. Similarly in all the FMCG companies as well as oil & gas companies, we can observe that the mean is fairly close to each other i.e. significantly well describing the forecasted prices. It seems that the way they

forecast the stock prices are similar. In other words, the practices of forecasting stock price in the market are same.

**Table 3- Correlations between the Forecasted Stock Prices by FDM and Magnus**

Sector	Company Name	Correlation	Sig.
Oil & Gas Sector	Attock Refinery	.998	0.00
	Bushrane LPG	.991	0.00
	OGDC	.990	0.00
	Pakistan Petroleum Ltd.	.990	0.00
	Pakistan State Oil	.994	0.00
FMCG Sector	Engro Foods	.885	0.00
	Unilever	.995	0.00
	Rafhan Foods	.990	0.00
	NESTLE Pakistan	.996	0.00
	National Foods Pakistan	.997	0.00

Table 3 shows the correlation between forecasted stock prices of FDM and Magnus. It was revealed that the correlation is significant. For instance, the correlation of forecasted stock price of Attock Refinery is  $[r = 0.998, p = 0.000]$  which is extremely close to each other representing the security firms' behavior significantly. Similarly, major companies in the oil and gas sector that have been taken in the sample i.e. Bushrane LPG, OGDC, Pakistan Petroleum and Pakistan State Oil show significantly higher correlations between the forecasted price of FDM and Magnus. Similarly, the forecasted stock prices for FMCG sector also represent significantly high correlation with each other. For instance,  $[r = 0.997$  and  $0.996$  with  $p < 0.05]$  for NESTLE and National Foods respectively which shows that the forecasted prices for both the companies are almost equal. Other companies like Unilever and Rafhan foods being comparatively lower but still highly significant  $[r = 0.885, 0.900$  with  $p < 0.05]$  respectively.

Table 4 shows the correlation between the forecasted stock prices and the original market prices of the two security firms. The results of the forecasts of FDM are found to be extremely significant particularly Attock Refinery and Rafhan foods  $[r = 1.00, p < 0.00]$  respectively. The

other companies are also showing statistically significant results i.e. Bushrane LPG, OGDC and other in the oil & gas. The FMCG sector is also showing a significant higher correlations i.e. greater than  $r = 0.95$ ,  $p < 0.05$ . This shows that the forecasting practices of FDM is significantly stronger as compared to the forecasted prices of the other firm Magnus securities. Like FDM, Magnus has also been tested for correlation in table 4 in order to determine the magnitude of relationship between Magnus and original market prices. There is certainly a close relationship among companies either with the oil & gas sector or even in FMCG sector. The closest relationship observed with Attock Refinery [ $r = 0.998$ ,  $p = 0.000$ ] showing 99.8% correlation in the forecasted Magnus prices and original market prices.

**Table 4- Correlation between forecasted stock price and original stock price**

Sector	Companies	FDM Security		MAGNUS Security	
		Correlation	Sig.	Correlation	Sig.
Oil & Gas Sector	Attock Refinery	1.000	0.000	.998	0.000
	Bushrane LPG	.995	.000	.995	0.000
	OGDC	.996	0.000	.994	0.000
	Pakistan Petroleum Limited	.998	0.000	.992	0.000
	Pakistan State Oil	.998	0.000	.995	0.000
FMCG sector	Engro Foods	.983	0.000	.901	0.000
	Unilever	.998	0.000	.998	0.000
	Rafhan Foods	1.000	0.000	.991	0.000
	NESTLE Pakistan	.999	0.000	.997	0.000
	National Foods Pakistan	.999	0.000	.997	0.000

Table 5 on the other hand, determines the mean differences in the forecasted prices of FDM and Magnus. The results of the paired sample t – test for Attock Refinery shows [ $t = 13.708$ ,  $p < 0.05$ ], a significant difference in the forecasted prices for both the securities. Similarly, in all the companies of oil & gas sector, there is significant difference observed. But these are not contradicting from the correlation which shows a close relationship. Here we have determined the differences in the forecasted prices with  $p < 0.05$  and correlation test showed that forecasted sign is co-integrated i.e. if FDM forecasts for an increase, simultaneously Magnus does the same though their existed a significant difference in the forecasted prices. The FMCG sector companies in Pakistan also showed a significant consistency of increasing or decreasing forecast



of the stock prices. Further, Unilever is the company in which there is no significant differences in the forecasted stock prices [ $t = -1.522$ ,  $p = 0.128$ ], accepting the null hypothesis and concludes that there is no significant differences. The reason might be that the prices of Unilever usually increases or remain stagnant and most importantly due to the huge price of its share, the volume of selling and is significantly low i.e. it increases proportionally without any significant spikes.

**Table 5- Paired sample t-test- Comparison of FDM and Magnus price differences**

Sector	Companies	t statistics	Df	Sig.
Oil & Gas Sector	Attock Refinery	13.708	1829	.000
	Bushrane LPG	-8.801	210	.000
	OGDC	-4.946	1842	.000
	Pakistan Petroleum Ltd.	11.430	1759	.000
	Pakistan State Oil	7.267	1828	.000
FMCG Sector	Engro Foods	-3.119	123	.002
	Unilever	-1.522	768	.128
	Rafhan Foods	11.616	695	.000
	NESTLE Pakistan	8.618	1177	.000
	National Foods Pakistan	3.616	1301	.000

Table 6 shows statistical differences in mean original market prices of oil & gas sector and FMCG sector against the FDM and Magnus security forecasted prices. The results have shown that there are significant differences found in the original market prices and prices forecasted by FDM [ $t = -5.227$ ,  $p = 0.000$ ] for Attock Refinery, rejecting the null hypothesis of no differences observed. Similarly, the other companies of oil & gas sector showed statistical difference in the forecasted and original market prices for this sector. All the other companies in the oil & gas sector i.e. Bushrane LPG, OGDC, PPL, PSO and Engro having statistically significant differences [ $t = -4.642, -7.977, -3.875, -8.756$ ,  $p < 0.05$ ] giving similar results as for Attock refinery and leads to the rejection of null hypothesis. In the same way, significant statistical results were obtained for FMCG sector. In all the paired test results, we have concluded that there are significant differences in the forecasted prices of FDM and original market prices.

**Table 6 - Paired Sample t-test- Comparison of forecasted stock prices by the two security firms with the original stock prices**

Sector	Companies	FDM			MAGNUS		
		t statistics	Df	Sig	t statistics	Df	Sig
Oil & Gas Sector	Attock Refinery	-5.227	1829	.000	-14.286	1829	.000
	Bushrane LPG	-4.642	210	.000	7.306	210	.000
	OGDC	-7.977	1842	.000	-.326	1842	.744
	Pakistan Petroleum Limited	-3.875	1759	.000	-15.207	1759	.000
	Pakistan State Oil	-8.756	1828	.000	-13.626	1828	.000
FMCG Sector	Engro Foods	-3.148	123	.002	2.170	123	.032
	Unilever	-7.894	768	.000	-5.197	768	.000
	Rafhan Foods	7.560	695	.000	-10.979	695	.000
	NESTLE Pakistan	-4.666	1177	.000	-11.460	1177	.000
	National Foods Pakistan	-9.435	1301	.000	-8.560	1301	.000

Like the market prices of FDM, a difference of comparison between the original market price and Magnus securities has been determined through paired sample t – tests in table 7. The result shows that there are significant differences found in the market prices and Magnus securities of Attock refinery [ $t = -14.286$ ,  $p = 0.000$ ] leading to the rejection of null hypothesis and thus leads to the conclusion that original market prices and Magnus forecasted security prices are significantly different from each other. The results are similar for the oil & gas sector as well as FMCG highly significant t – value with  $p < 0.05$ . Only one forecast of Magnus which was significantly close to the original market prices i.e. OGDC [ $t = -0.326$ ,  $p = 0.744$ ] leads to the acceptance of null hypothesis and through which we can conclude that there is statistically no difference in the mean forecasted prices of Magnus and original market prices for OGDC. As a whole, it can be concluded from the above analysis that there is a close relationship between the forecasted prices of Magnus and FDM i.e. strong positive relationship. Further, there are differences found in the forecasted and original market prices for both the security companies.

### Conclusion

The study includes 10 companies as a whole of which 5 companies are from oil & gas sector whereas remaining 5 are from FMCGs. For a brief and reliable analysis, we have worked on the daily data of stock market prices from 2005 through 2012. As a source of forecasted data, we

have selected FDM and Magnus security firms and employed paired t –test to determine the mean differences between the original and forecasted stock prices. Further, correlation test has been applied to determine the relationship between the forecasted FDM and Magnus prices along with the original market prices. From the results, it was observed that there are significant differences found in the forecasted stock prices in oil & gas as well as FMCG sector. Further, the correlation was found to be highly significant, showing high linear association between the respective and security forecasted prices and even with their respective comparison against the original market prices. As a whole, the study is found to be extremely significant for an investor due to various reasons. Initially an investor with a significant amount can easily invest in either of the security firms because of high correlation between the forecasted prices and original market prices. On the other hand, FDM security is found to have better forecasted prices, on average, in comparison to the Magnus securities. Though Magnus did not have a bad record against the forecasted prices because it also shows significantly higher correlation with the original market prices but still in comparison to the FDM securities, the magnitude of difference with Magnus and FDM are fairly different.

### **References**

- Cristi A. Gleason and Charles M. C. Lee (Jan, 2003) “Analyst Forecast Revisions and Market Price Discovery” *The Accounting Review* Vol. 78, No. 1.
- Geert Bekaert, R. J. (Dec., 2009). “International Stock Return Comovements”. *The Journal of Finance*, Vol. 64, No. 6 .

Grace Pownall, Charles Wasley and Gregory Waymire (Oct., 1993). “The Stock Price Effects of Alternative Types of Management Earnings Forecasts” The Accounting Review, Vol. 68, No. 4.

Pu Liu, S. D. (Sep., 1990). “Stock Price Reactions to The Wall Street Journal's Securities Recommendations”. The Journal of Financial and Quantitative Analysis .Vol.25 , No.3

Battalio Robert, Andrew Ellul and Robert Jennings (Jun., 2007), “Reputation Effects in Trading on the New York Stock Exchange”The Journal of Finance, Vol. 62, No. 3.

Xavier Gabaix, Parameswaran Gopikrishnan, Vasiliki Plerou and H. Eugene Stanley (May, 2006). “Institutional Investors and Stock Market Volatility” The Quarterly Journal of Economics Vol. 121, No. 2. Financial Analysts Journal, Vol. 64, No. 4.

## APPENDIX

**Table 1**

### Sample Companies

<b>Company</b>	<b>Years</b>	<b>Observations</b>
Attock Refinery	2005-2012	1830
Bushrane LPG	2011-2012	212
OGDC	2005-2012	1842
Pakistan Petroleum Limited	2005-2012	1760
Pakistan State Oil	2005-2012	1830
Engro Foods	2011-201	124
Unilever	2009-2012	769
Rafhan Foods	2009-2012	696
NESTLE Pakistan	2008-2012	1178
National Foods Pakistan	2008-2012	1302

**Table 2**  
**Descriptive Statistics of Forecasted Stock Prices**

Company Name	Brokerage Firms	Mean	Std. Deviation	Std. Error Mean
<b>Oil and Gas Sector</b>				
Attock Refinery	FDM	140.66	56.41	1.31
	Magnus	139.53	56.05	1.31
Bushrane LPG	FDM	40.49	10.35	0.71
	Magnus	41.37	10.65	0.73
OGDC	FDM	117.54	29.20	0.68
	Magnus	118.01	29.33	0.68
Pakistan Petroleum Ltd.	FDM	209.62	40.19	0.95
	Magnus	208.03	40.14	0.95
PSO	FDM			
	Magnus			
<b>FMCG Sector</b>				
Engro Foods	FDM	24.73	2.96	0.26
	Magnus	25.17	3.37	0.30
Unilever	FDM	3708.26	1343.51	48.44
	Magnus	3715.38	1346.00	48.53
Rafhan Foods	FDM	1834.08	681.92	25.84
	Magnus	1792.15	671.16	25.44
NESTLE Pakistan	FDM	1723.68	1043.31	30.39
	Magnus	1699.99	1031.67	30.05
National Foods	FDM	130.18	108.62	3.01
	Magnus	129.30	108.13	2.99
	Magnus			