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Effect of Dividend Announcement on Share Prices of Petroleum Industry of Pakistan

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ABSTRACT

This study intends to focus on the impact of dividend announcement on share prices of four different sectors i.e. refineries, fertilizer, oil and gas exploration and oil and gas marketing sectors of Karachi Stock Exchange. Data was collected from the official web site of KSE and Yahoo! Finance for a period of 6 years comprising from year 2005 to 2010. The methodology of standard event window was used in which data was examined by twenty-one day event window with lag of 10 days before and 10 days after announcement of dividend. Estimation window was estimated for a period of 3 months to calculate normal returns for both the company and market. The T-Test was applied on average abnormal returns (AAR) that were derived from the company's returns and market returns.

In general, dividend announcements give positive signals to shareholders and results in increase of share prices. Semi-strong form of market efficiency also implies that effect of public information is depicted by share prices. However, Results of this study reveal that the dividend announcements have no significant impact on share prices of either of the sectors under investigation. Hence, Karachi Stock Exchange has been proven to be in efficient in the light of this study.

KEYWORDS: Dividend Announcement, Semi-Strong Efficiency, Event Study, Oil & Gas Sector, Refinery Sector, Fertilizer Sector.

I. INTRODUCTION

Efficient Market Hypothesis (EMH) discusses the relationship between the total information available in the market and the stock prices of the company. This theory states that prices fully calculate the effect of all sorts of current and past information in them. According to efficient market hypothesis, share prices fully reflect all existing information and on the basis of that information extra returns can't be gained. According to the semi strong form of market efficiency hypothesis, all public information is fully shown and reacted upon by the stock prices. Semi strong form of efficiency implies that stock prices react to all public information and investors cannot get extra returns on the basis of that information. This is because the prices have already reacted to these prices. This public information includes company related announcements, calculated ratios, financial statements and any other information made public by the company. One specific information amongst the public announcements of the company is that of dividend announcements.

Dividend is given by corporations to shareholders as return out of their profits. In other words, dividends are the income for the company. Dividend announcement affects share prices positively (Miller & Rock, 1985; John & Williams, 1985). Dividend raise generates positive signals about current and future cashflows of firm and negative vice versa (Gordon, 1959; Brunarski, Harman & Kehr, 2005). Depending upon dividend policy of firm, it is paid either in the form of regular cash or additional stock, and its payment pattern i.e. quarterly, semiannually or annually also depends on company's dividend policy.

Many researchers have till date made attempts to study the impact of dividend announcements on share prices and concluded diverse results, some proposed positive relationship (Acker, 1999; Pettit, 1972; Aharony & Swary, 1980; Walter, 1956; Gordon, 1959). While on the other hand, some found negative relationship (Easton & Sinclair, 1989; Loughlin, 1982).

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Although extensive work and research has been done in this regard, but no study has yet touched collectively upon these four sectors i.e. refineries, oil and gas exploration, fertilizer, and oil and gas marketing sectors of Pakistan.

Selecting these four sectors was imperative since oil and gas sector has huge impact on Pakistan's economy. The downstream section of petroleum sector encompasses, besides other, crude oil, gas, refining, petrochemicals, fertilizers, synthetics, pharmaceuticals and others. So all these four sectors are interrelated actually and study of these sectors was vital, especially in context of Pakistan. Oil and gas sector isn't complete without both its marketing side and its exploration side which comprise the upstream and midstream section of petroleum sector. Hence, these two can't be studied in isolation. What's more, refineries and fertilizer companies are directly linked to firms operating in the oil and gas sector. Therefore extending our research to these was of the essence. Furthermore, the significance of this sector can be estimated by the fact that Oil & Gas sector alone comprises of 6% of the total turnover of the market.

II. LITERATURE REVIEW

"The harder we look at the dividend picture, the more it seems like a puzzle, with pieces that just don't fit together" (Black, 1976, p. 8).

Dividend is given as return to investors who invest in corporations despite of risk factor (Black, 1976). When firms announce about payment of high dividend it means after investing in different projects, they are left with excess cash that will also result in positive changes of share's prices. Whereas, firms that don't pay dividend exhibit that they will reinvest amount of dividend in projects having positive net present value, which ultimately results in rise of share's value and shareholders get benefit in form of capital appreciation (Black, 1976).

Many researches are done, and many past theories verified the significant impact of dividend announcement on share prices. These theories have shown that when an increase in dividend is announced, this result an increase in stock prices and when decrease is announced, then stock prices also tend to decrease (Graham & Dodd, 1951; Foster & Vickery, 1978; Ariff & Finn, 1986; Kato & Loewenstein, 1995; Divecha & Morse, 1983; Healy & Palepu, 1988; Michaeiy, Thaler & Womack, 1995; Walter, 1963). The agency conflicts among management and shareholders of firm can be resolved by dividend payment (Black, 1976; Easterbrook, 1984).

The stock prices of firm's decrease due to announcement of dividend cuts and increase due to announcement of dividend rise. These variations in stock prices will be temporary if changes in dividend are not due to forecast of company's prophecy, and will be permanent in vice versa (Black, 1976; Aharony & Swary, 1980; Acker, 1999; Pettit, 1972). Lintner (1956) put forward that the dividend will be increased by board of directors of firm, if they consider that increase as permanent. But later on Bhattacharaya (1979), enlightened the existence of asymmetric information among shareholders and management of firm, he also proposed that shortfall in resources occur due to dividend payment which need rising of capital, outstanding investment and higher taxes (Miller & Rock, 1985; John & Williams, 1985).

Hence it can be seen that mixed results have been illustrated by empirical studies. Negative relationship between dividend announcement and share prices was also founded due to tax effect (Easton & Sinclair, 1989; Loughlin, 1982).

Studies have also shown the two factors to be indifferent and independent of each other. A supportive study of this was carried out in DSE. Uddin and Chowdhury (2005) examined the impact of dividend announcement on Dhaka Stock Exchange, and found that in Dhaka Stock Exchange dividends don't depict any type of information regarding share prices and share returns.

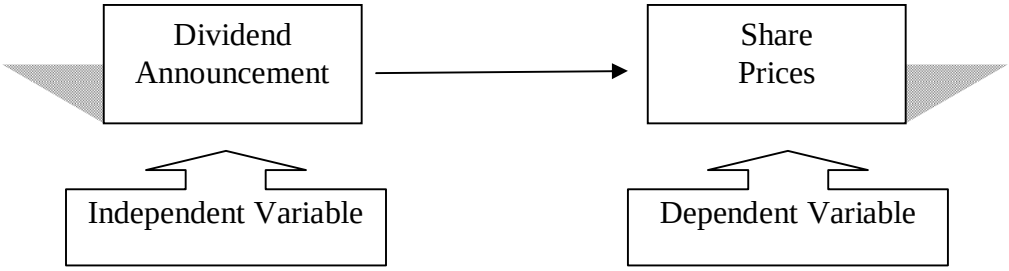
Much research has been carries out on dividend effect but the results have not consistent. Miller and Modigliani (1961) presented *Dividend irrelevance theory* and state that in perfect economy where there are no taxes and transaction cost, dividend payment have no impact on investor's return and value of shares. But dividend discount model of Gordon (1959) demonstrate that the value of shares increase due to increase in dividend payment. The information regarding future value of firm has also been determined by *dividend's signaling theory*. As managers of a firm are well informed as compared to outside shareholders, so whenever managers want to convey positive news about their firm they give signal to outsiders that may be in the form of dividend increase, in order to cause an increase in the firm's stock prices.

The above literature supports relevance of positive effect of dividend announcement on stock prices, although some studies showed negative. Historical economists have always been interested in this subject and many popular finance theories in this regard have also been quoted, though in their jest.

Although plenty of literature and studies are available on the topic but no study has yet touched and applied this very topic on four different sectors of Pakistan. Since these sectors have huge impact on Pakistan's economy, hence they were chosen in the paper under reader's observation to add a significant contribution to the existing body of knowledge.

III. Theoretical Framework:

This study takes into account the relationship between Dividend Announcement and its impact on share price. According to the model under study, share prices tend to move at dividend announcement. Hence the announcement of dividend is being taken as the independent variable whereas the share prices are taken as dependent variable.



This leads to the development of hypothesis, which is given as under.

Hypothesis Development:

H_1: "*There is significant positive association between dividend announcement and share prices.*"
Investors perceive dividend announcements as positive news because companies are left with extra cash after investing in projects having positive NPV. So it means that company's expected growth rate will increase in future resulting an increase in its earnings per share and as a result its share price will also inflate. Walter (1956), and Gordon (1959), presented the idea of dividend relevance, which means that current share prices include expected dividend payments pattern of future. It means firms having sound and significant investment opportunities signal high amount of dividend as compared to those which don't have such opportunities.

IV. DATA AND METHODOLOGY

The sample data includes daily data from refineries, Oil and gas exploration, Oil and gas marketing and fertilizer sectors of Pakistan. The index and stocks data was collected from websites of Yahoo! Finance and SCS Trade whereas dividend announcement dates data was collected from the official website of Karachi Stock Exchange. It includes 27 available dividends announcements from oil and gas marketing sector, 18 from oil and gas exploration sector, 11 from refineries and 17 from fertilizer sector for a period of 6 years spanning from Jan 2005 to Dec 2010. Announcements are only for Final Cash Dividend for each company.

This study tends to investigate the impact of dividend announcement on stock prices by using ***event window methodology***. Event Study method is generally used when the impact of a specific event on the company needs to be investigated. It is the most effective tool to test for the semi strong efficiency of the market. A 21-day event window has been used with lag of 10 days before and 10 days after dividend announcement. A 3 months estimation period before the event window was also studied to determine the normal behavior of stocks with respect to market forces.

In the very first step of analysis, stock returns and market returns are estimated using compound return. This is done by taking the natural log of the first difference of their respective prices;

$$R_t = LN\,(P_t / P_{t-1})$$

Where:
Rt = Returns on day 't'
LN = Natural Log
Pt = Price on day 't'
Pt-1 = Price on day 't-1'

These stock returns and market returns are calculated for three months before the event window for the purpose of devising the estimation window. Estimation window is ascertained for the objective of determining stock's normal behavior with respect to market factors. This is done by running regression between the returns, where company specific returns are taken as dependent variable whereas market returns are taken as independent variable. The following equation is hence estimated:

$$R_{it} = \alpha + \beta R_{mt} + \mu_i$$

Where:
R_{it} = expected return on company i stock on any given day t
α = constant term
β = sensitivity of company stock to market returns R_{mt}
R_{mt} = market return on any given day t

Next procedure is the creation of event window. This is done by taking into consideration the stock returns and market returns of 10 days before and 10 days after the occurrence of event i.e. announcement of dividend.

The first calculation after event window is created, is the estimation of Expected Returns for the 21 days of event window. It is calculated through:

$$\mathbf{ER = Intercept + (Slope * Index\ Return_t)}$$

Following this, the abnormal returns are calculated on each day of the event window for both the index and the stock itself. The formula used is:

$$\mathbf{AR = R_C - ER}$$

Where:
AR= Abnormal returns
R_C=Company returns
ER= Expected returns

After this, the cumulative abnormal returns (CAR) are calculated as:

$$\mathbf{CAR = CAR_{t-1} + AR_t}$$

Where:
CAR_{t-1}= cumulative abnormal returns of previous day
AR_t = abnormal returns of current day

Further, the average abnormal returns (AAR) are calculated from which the cumulative average abnormal returns (CAAR) can also be estimated in the same manner as CAR. The average abnormal returns are calculated by;

$$\mathbf{AAR} = \frac{\sum \mathbf{AR}}{\mathbf{n}}$$

We use parametric test i.e. t-test for determining the statistical significance of AAR. The formula is;

$$t = \frac{\mathbf{ARt}}{\sqrt{\sum steyx^2 / \mathbf{n}}}$$

Here STEYX stands for standard error.

V. EMPIRICAL RESULTS:

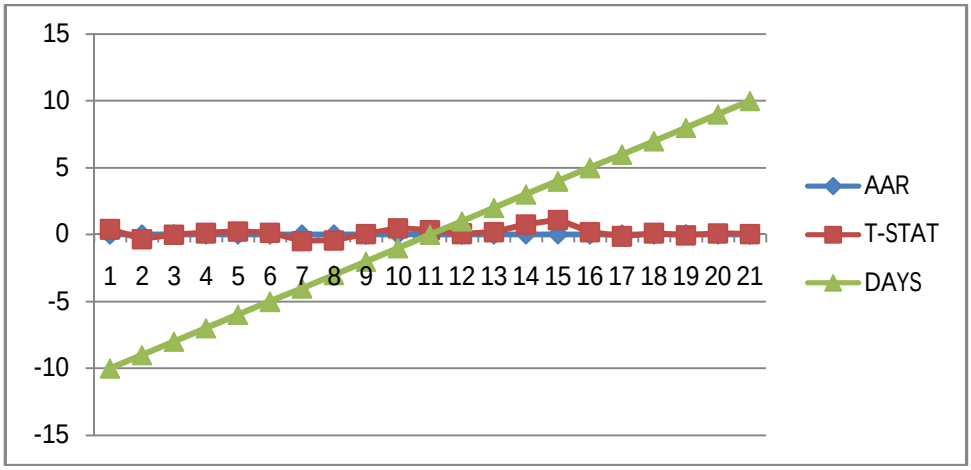
This section includes the sector wise analysis and interpretation of data by applying t-test on the calculated twenty-one day event window. The tables below show the average abnormal returns (AAR), the t-values of average abnormal returns (AAR) and cumulative average abnormal returns of each sector.

Table 1 represents the refinery sector. It includes Attock refinery, Pakistan refinery and National refinery.

Table-1: T-Test Results of Refinery Sector

Day	AAR	T-STAT	CAAR
-10	0.8222%	0.404442942	0.8222%
-9	-0.6899%	-0.339370071	0.1323%
-8	-0.0216%	-0.010629366	0.1107%
-7	0.2468%	0.121423035	0.3575%
-6	0.4959%	0.243964336	0.8535%
-5	0.2911%	0.143199971	1.1446%
-4	-0.9653%	-0.474838909	0.1793%
-3	-0.8974%	-0.441438291	-0.7181%
-2	0.1027%	0.050538144	-0.6154%
-1	0.9805%	0.482317423	0.3651%
0	**0.654**%	**0.321697984**	**1.0191**%
1	0.1387%	0.068227767	1.1578%
2	0.4249%	0.209019265	1.5827%
3	1.5845%	0.779461151	3.1672%
4	2.2308%	1.09739369	5.398%
5	0.4085%	0.200964626	5.8066%
6	-0.2502%	-0.123055197	5.5564%
7	0.2434%	0.119733653	5.7998%
8	-0.1268%	-0.062383691	5.673%
9	0.2292%	0.112728188	5.9022%
10	0.1207%	0.059370711	6.0229%

AAR is average abnormal return, CAAR is cumulative average abnormal return, t-values are the t-statistics of AAR.



The above line chart represents a graphical view of the AAR and t-statistic of the refinery sector. The decision criterion of significant relationship is t-value being greater than the critical value of 1.96. As can be seen from the table above, not a single value has exceeded the critical value, hence implying an insignificant relationship between the returns and the event of dividend announcement. The insignificant result encompass the event day itself too. The t-value for the 15th day shows a hike at reaching 1.09 but it still isn't enough to exceed the critical value.

Table 2 represents the fertilizer sector. It includes Dawood Hercules, Fauji Fertilizer Bin Qasim and Fauji Fertilizer Company Ltd.

Table 2: T-Test Results of Fertilizer Sector

Day	AAR	T-STAT	CAAR
-10	1.008%	0.584334726	1.008%
-9	0.236%	0.136824523	1.245%
-8	-0.14%	-0.082529752	1.102%
-7	0.672%	0.389441855	1.774%
-6	0.173%	0.100473708	1.948%
-5	-0.24%	-0.141605197	1.703%
-4	0.533%	0.30899962	2.237%
-3	-0.06%	-0.036282171	2.174%
-2	-0.1%	-0.060634331	2.069%
-1	0.385%	0.223047205	2.454%
0	**-0.31%**	**-0.180444321**	**2.143%**
1	-0.65%	-0.3755013	1.495%
2	0.512%	0.29684354	2.007%
3	-0.34%	-0.195237375	1.67%
4	0.536%	0.310451578	2.206%
5	0.133%	0.077277758	2.339%
6	-0.19%	-0.108399913	2.152%
7	-3.14%	-1.819191601	-0.99%
8	3.253%	1.885119126	2.266%
9	0.129%	0.074469222	2.395%
10	-0.41%	-0.237332093	1.985%

AAR is average abnormal return, CAAR is cumulative average abnormal return, t-values are the t-statistics of AAR.

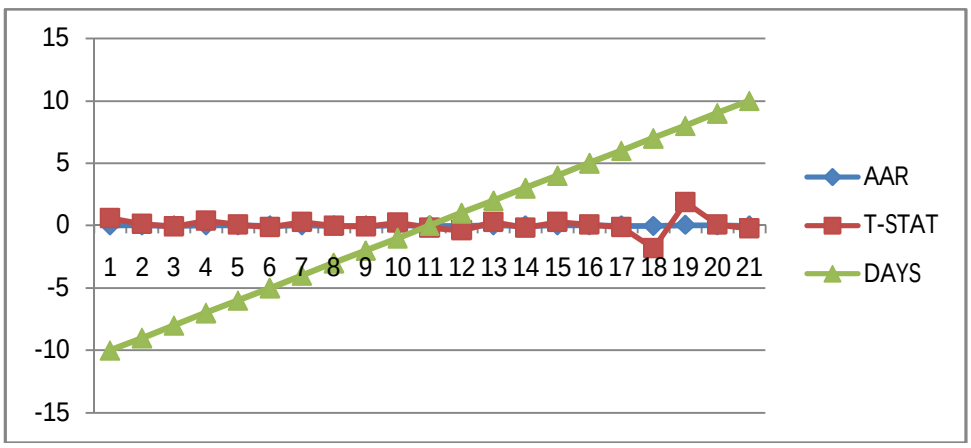


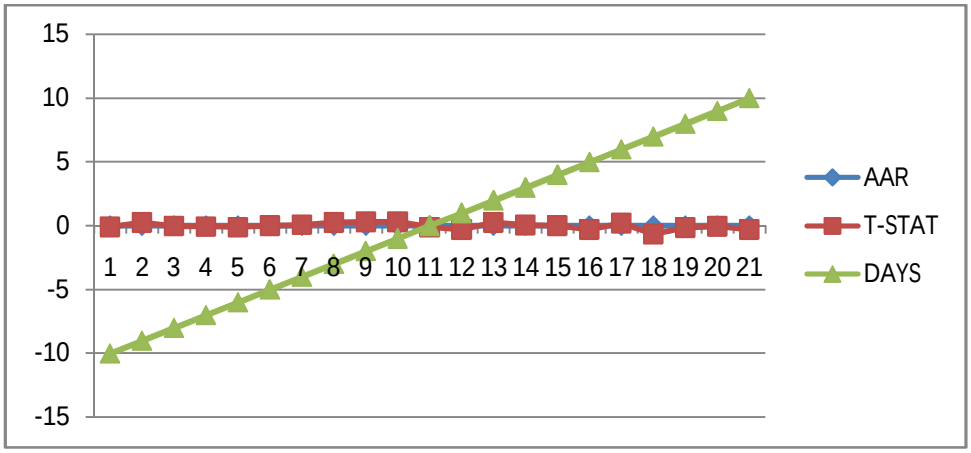
Table 3: T-Test Results of Oil & Gas Marketing Sector

Day	AAR	T-STAT	CAAR
-10	-0.1602%	-0.086811586	-0.1602%
-9	0.4748%	0.257337682	0.31463%
-8	-0.0536%	-0.029072917	0.26099%
-7	-0.1232%	-0.066784116	0.13777%
-6	-0.2216%	-0.120127346	-0.0839%
-5	-0.016%	-0.008669975	-0.0999%
-4	0.12583%	0.068197632	0.02596%
-3	0.44693%	0.24223382	0.47289%
-2	0.56721%	0.307425298	1.0401%
-1	0.55478%	0.300686245	1.59488%
0	**-0.222%**	**-0.120299077**	**1.37292%**
1	-0.5395%	-0.292403833	0.83343%
2	0.45893%	0.248738048	1.29236%
3	0.09747%	0.052825464	1.38982%
4	0.02298%	0.012457306	1.41281%
5	-0.5426%	-0.29410288	0.87018%
6	0.37657%	0.204097865	1.24675%
7	-1.2003%	-0.650558871	0.04644%
8	-0.2683%	-0.145392957	-0.2218%
9	-0.1141%	-0.061853873	-0.3359%
10	-0.5458%	-0.29583748	-0.8818%

The results show t-value = -0.180444321 for the event day (dividend announcement)**,** which means that the relationship among dividend announcement and share prices in fertilizer sector is insignificant and inversely related. The 18th and 19th day capture active movement of returns, both negative and positive, yet both are statistically insignificant.

Table 3 represents the oil & gas marketing sector. It includes Attock Petroleum, P.S.O., Shell Pakistan, Sui Northern Gas and Sui Southern Gas.

AAR is average abnormal return, CAAR is cumulative average abnormal return, t-values are the t-statistics of AAR.



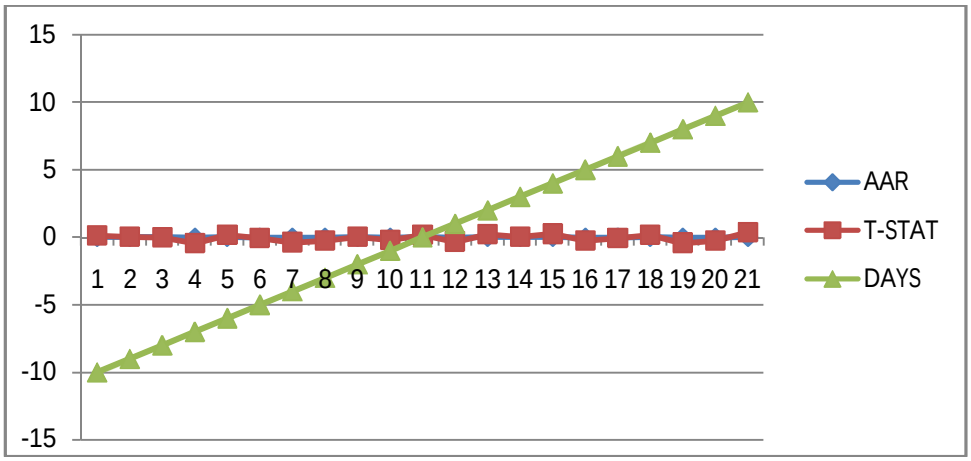
The results show t-value = -0.120299077, which means that the relationship between dividend announcement and share prices in oil & gas marketing sector is insignificant and in opposite direction. This observed t value is much less than the critical value of 1.96. Hence hypothesis that dividend announcement has significant positive relationship with share prices is rejected in this sector as well. Rather an insignificant negative relation is being observed.

Table 4 represents the oil and gas exploration sector. It includes Oil and Gas Ltd, Pakistan Oilfields and Pakistan Petroleum Ltd.

Table 4: T-Test Results of Oil & Gas Exploration Sector

Day	AAR	T-STAT	CAAR
-10	0.138227%	0.107946542	0.138227%
-9	0.050759%	0.039639723	0.188987%
-8	-0.02826%	-0.022069945	0.160726%
-7	-0.5665%	-0.442401141	-0.40578%
-6	0.239126%	0.186741992	-0.16665%
-5	-0.10611%	-0.082863072	-0.27276%
-4	-0.48186%	-0.376298764	-0.75461%
-3	-0.31871%	-0.24888808	-1.07332%
-2	0.054037%	0.042199599	-1.01928%
-1	-0.25088%	-0.195922355	-1.27016%
0	**0.246796%**	**0.192731809**	**-1.02337%**
1	-0.41856%	-0.326866732	-1.44193%
2	0.272265%	0.212621338	-1.16966%
3	0.058061%	0.045341705	-1.1116%
4	0.314634%	0.245709175	-0.79697%
5	-0.31242%	-0.243981195	-1.10939%
6	-0.09155%	-0.071495669	-1.20094%
7	0.241969%	0.188962138	-0.95897%
8	-0.53653%	-0.418994092	-1.4955%
9	-0.30252%	-0.236246229	-1.79801%
10	0.461517%	0.360414955	-1.3365%

AAR is average abnormal return, CAAR is cumulative average abnormal return, t-values are the t-statistics of AAR.



The results show t-value = 0.192731809 for dividend announcement day 0**,** which means that the relationship between dividend announcement and share prices in oil & gas exploration sector is again insignificant.

All four sectors of petroleum industry have shown insignificant results denoting thereby that Karachi Stock Exchange is not semi strong efficient. The stocks do not price the public information efficiently.

VI. Conclusion

The semi-strong form of market efficiency suggests that all material past and public information is reflected in stock prices. Therefore, investors don't have the opportunity to gain above market returns as all historical and public information is already priced by the stocks. To investigate this semi-strong form of market efficiency in the KSE, we investigated dividend announcements with stock prices (returns). Only final cash dividend was taken in this regard.

It was found that the relationship between prices of stocks and cash dividend announcements is statistically insignificant. The returns are mostly negative for the 21-day window, which might be attributed to the tax effect of cash dividends. Most of the values were less than 1 depicting a weak relationship between the event under study and stock returns. However, the negative returns are partly compensated by the cash dividends to investors which were not included in the calculations of returns. Overall, the results reject the semi-strong form of market efficiency of the KSE. The risk remaining un-responded here is the unsystematic risk.

However, research has no limit and there is a room for extensive research in this regard in future. Stock dividends go un-taxed in Pakistan. Hence they are perceived to be positive by the general investor. It would be interesting to note the response of share prices to the event of announcement of stock dividends. Furthermore, other sectors from the KSE too can be worked upon to test the semi strong efficiency of KSE.

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