



An Event Study on the Response of Stock Returns to Repurchase of Stock News

Zia ul Haque

PhD Scholar, Greenwich University, Karachi
haq.ziaul@gmail.com

Farhan Ahmad

Assistant Professor, Department of Economics & Management Sciences, NED University of Engineering
and Technology,
Karachi - 75270, Sindh, Pakistan
fahmed@neduet.edu.pk

Abstract

This study investigates how stock returns respond to news of stock repurchases. The objective is to ascertain market reaction and pricing adjustment (response) to the announcement of stock repurchase at Pakistan Stock exchange. As chosen by many researchers in this field, an estimation period of 120 days and a test period of 11 days has been selected, daily price data from seven businesses (listed on the PSX) that announced stock repurchases between May 2022 and February 2023 along with corresponding PSX index values were used. Utilizing the data from the estimation period and using OLS (ordinary least squares) market model, normal(Expected) returns were derived. The null hypothesis “Stock repurchase does not have any relationship with abnormal return is rejected, as a result of the test statistics showing a significant relationship between event stock repurchases and abnormal returns.

Key words: Stock Repurchase, stock returns, Cumulative abnormal return.



Introduction

The most debated hypothesis in finance in last four decades is Efficient Market Hypothesis (EMH). Researchers on both sides (Behaviorists and EMH) have strong evidences for and against it, there is no clear evidence for rejection or acceptance of EMH. No study has however been done in Pakistan to test the efficiency of capital market particularly semi-strong-form efficiency. This is a maiden study to know the response of stock return to repurchase announcement to ascertain the capability of the market to adjust to new announcement and pricing mechanism in place at PSX.

According to Fama (1991), the efficient market hypothesis holds that investors are rational, stock prices reflect all relevant information, and buyers and sellers do not need to be concerned about paying too much or receiving an excessive price. At their intrinsic worth, stocks are sold. Using various value-enhancing tactics, a company can raise the share value of its stock. Repurchasing shares is another value-enhancing tactic (a way of paying cash to a company's shareholders that offers a more favorable tax treatment than dividends). The term "treasury stock" refers to previously issued stock that has been bought back by the company. *Journal of Financial Economics* (October–November 1995): D. Ikenberry, J. Lakonishok, and T. Vermaelen, "Market under reaction to open market share repurchases." This paper using the event study approach examines the impact of response of stock return as a result of announcement of the firm to buy back of its own stock. The market's established pricing structure may reflect efficiency or not, resulting in any anomalous returns. An opportunity (Test) window of 11 days and an estimation window of 120 days have both been chosen.

If there is no possibility to obtain an uncommon or excessive profit utilizing a piece of information, a market is efficient with respect to that information. Prof. Shleifer and other members of the academic community contend that the criteria for market efficiency are unlikely to exist in practice. This stance is supported by behavioral finance. This suggests that a change in price in response to an event must occur immediately; if considerable abnormal returns are noticed before announcement and after announcement that is during the run up period, this may imply market inefficiency. Insider information leaking is a common problem at a substantial level up to 12 trading days prior to the initial public announcement, according to Pinkerton's (1981) analysis of US data. Market inefficiency is not present when there is a sizable abnormal



return on the announcement date. If considerable abnormal returns are discovered before, or after the announcement day, this demonstrates the event's impact's persistence and provides proof that the market is inefficient.

We know that people have feelings. (Sewell, M, and Behavioral Finance) which can affect their decisions, so behavioral finance relates to the psyche of people. Research (Pompian, M behavioral Finance and wealth management) in the field of behavioral finance has shown that in an efficient capital market, no excess returns as predicted by capital asset pricing models can be obtained with technical analysis—that is, using past pricing data to predict future stock prices. Similar to a herd of sheep (De Bondt, W, Bubble psychology) when it becomes apparent that one group of investors is prospering, the others start to follow them without using their own judgment. This herding behavior enables professionals to profit from the irrational behavior of amateurs, who turn to arbitrage activity to raise sizable sums of money. When overvalued markets and bubbles inevitably burst, the same behavior takes place in reverse, leading to greater falls than can be justified by any logical justification (Shiller, R.J Bubbles, Human judgment and Expert opinion). Studies demonstrate that markets are largely rational but may occasionally display irrational behavior (H.N. Seyhun, 1998). It is crucial to conduct a rational analysis because stock prices can often deviate significantly from intrinsic values over extended periods of time, providing possibilities for arbitrage to more knowledgeable investors. Market anomalies including speculative bubbles, overreaction to new information and under reaction to it are evidence that financial decisions are not always made in a cold, logical manner. Behavioral finance makes an effort to comprehend these judgmental abnormalities.

Most people prefer the three factor model to the CAPM model, which exhibited anomalies that were not compatible with EFFICIENT MARKET HYPOTHESIS (EMH). Given that investors' psychology influences their behavior when making financial decisions, their biases are reflected in those behaviors, which results in less-than-optimal outcomes. Dominance of these behaviors can trigger market disruptions. Increased professional awareness of the psychological and behavioral constraints of armatures is necessary to prevent such psychological behavior.

Significance of the study:

This study is designed to investigate how stock returns respond to the news of company's repurchases of its own stock and determine as to whether the Pakistani capital market is a semi-



strong form efficient and as such is a desirable investment avenue for sophisticated investors. Limited to the companies listed on PSX that are impacted by the event (news) of the "stock repurchase," an event research has been carried out. The daily return statistics of the chosen companies and the matching return on PSX have been examined for this purpose. Investors will be able to comprehend the pricing mechanism in place on the Pakistani capital market as a result of this study.

Literature Review

Because information is quickly reflected in the prices under the efficient capital market hypothesis (EMH), investors should only anticipate receiving a regular rate of return. Knowing information that has already been made public is useless to investors. Prices change instantly, before an investor has a chance to profit from it. To receive fair (intrinsic) value for the securities they sell, companies should be prepared. Fair refers to the present worth of the prices they receive for the securities they sell. As a result, efficient capital markets do not provide access to attractive profiting possibilities that may develop by taking advantage of investors' limited understanding of the pricing mechanism by amateurs.

Faisal and Azam (2020) study aims to explore the interplay between corporate announcements of firms with abnormal returns (AR) and price-sensitive announcements' effects on stock return anomalies. The study examined 279 announcements over the course of two years, from January 2016 to December 2017. The announcements covered financial outcomes, ownership changes, capital structure changes, and factory expansions. For the event window of 30 days (15, +15), they used the event study methodology to determine the Cumulative Abnormal Return (CAR). The moderating impact of business announcements on abnormal returns was also examined in the study using hierarchical moderated regression analysis. The results showed that insiders who purchased equities ahead of business announcements experienced larger abnormal returns. The findings also showed that these returns are particularly connected to purchases made prior to the announcement of plant expansion, financial performance, and capital structure changes. The study also showed that insiders with advance knowledge of corporate announcements can boost predictability and generate return regardless of the operating business of the company. The outcomes shed more light on how well the Pakistani Security and Exchange Commission (SECP) has been able to prevent insider trading on the Pakistan Stock Exchange



(PSX). The report advises individual investors to diversify their holdings in order to protect their returns.

Ibrahim M. et al. (2021) examined the stock return behavior related to earnings disclosure for 227 firms listed on the PSX between 2004 and 2013 using the event study approach. The PSX is a semi-strong inefficient market, according to empirical evidence, which also implies that earnings announcements produce big returns on the day of the announcement. Second, significant returns that were indicative of knowledge leakage were seen during the preannouncement period. Thirdly, there was a lag in the investor response as seen by the high returns that were seen in the post-announcement period. Fourth, a post-earnings release drift anomaly for negative earnings announcements is revealed, and fifth, it is discovered that the results depend on the kind of statistical test used.

According to Dyckman et al. (1984), an event study is a statistical approach to an empirical analysis of the connection between securities prices and economic events. The majority of studies on events have concentrated on stock price behavior in order to determine whether firm-specific events have an impact on their profitability behavior. Full documentation on how stock prices react to economic information is provided by Fama et al. (1969). Mackinlay (1997: 13) also discusses how a specific incident affects a firm's worth. Ikenberry, D. Market underreaction to open market share repurchases: J. Lakonishok and T. Vermaelen, *Journal of Financial Economics*, October-November 1995. Among many such studies, "stock prices and top management changes," *Journal of Financial Economics* 20 (1988), by Jerold B. Warner, Ross L. Watts, and Karen H. Wruck stands out.

What factors contribute to market efficiency is the crucial question. One of the following three conditions, according to Andrei Shleifer (Shleifer, Andrei, *Inefficient markets: An introduction to Behavioral Finance*, Oxford University Press, United Kingdom, 2000), will result in market efficiency: (a) rationality, which presupposes that all investors are rational and behave rationally in financial decision making and that the market stays efficient. (a) Independent divergence from rationality assumes that there were equally as many irrationally optimistic and pessimistic people. Price increases would most likely follow the efficiency of the market. Therefore, only compensating irrationalities are necessary for market efficiency. Arbitrage is based on the



premise that markets will remain efficient even if professionals overwhelm amateur speculators in the simultaneous sale and acquisition of various but substitute securities.

The event study literature can be divided into two categories: (a) studies that developed methodologies and test statistics, and (b) studies that actually applied the methodologies developed by earlier researchers such as Dimson (1979), Brown and Warner (1980 & 1985), Campbell and Wesley (1993), Park (2004), and Louma (2011). These researchers provide the methodologies for event study using both parametric and nonparametric test statistics to determine the significance of the test results. The response of the developed and emerging stock markets to the Covid-19 epidemic was the subject of an event research by Dharen Kumar Pandey and Vineeta Kumari. They discovered that the outbreak had a major influence on financial markets around the world, with Asian markets being the hardest hit.

Weak Form Efficiency

A stock's current price is equal to its previous observed price plus any random error and the projected return on the stock over the specified time period (day, week, month, etc.). The stock's new information has a random component that could be positive or negative with an anticipated value of zero. The random component is not predictable from historical pricing since it is not tied to the random component in any other time, which is expressed mathematically as:

$$P_t = P_{t-1} + \text{Random error},$$

This pattern of stock prices is called random walk, (Malkiel, B.G 2003), which is a manifestation of weak form efficiency. Atallah, A., Song, X., & Tippett, M. (2011).

The Semi strong and Strong Form efficiencies.

If prices reflect all publicly accessible information, including that contained in the accounting statements issued by the firm. Fama (1970), then a market is considered semi-strong form efficient. If prices represent all information, whether it is public or private, the market is strong form efficient.

Event Analysis of Events such as stock repurchases, mergers and acquisitions, bankruptcies and liquidations, insider trading, etc. cause abnormal changes in stock prices to occur. Event studies



analyze whether information released at time 't' is reflected to the abnormal returns of that time 't' alone or whether the release of information influences returns on other days (Barber & Lyon 1997; Brown & Warner 1980, 1985).

Abnormal return on a given stock for a particular period can be calculated by subtracting the expected return from the stock's actual return for the period using the market model from the actual return, which is expressed algebraically as:

$$AR = R_{it} - E(R_{it}), \text{ where}$$

$$E(R_{it}) = \alpha + \beta R_{mt}.$$

Event study is a prominent research technique that was created around 50 years ago and is regarded by academics as a crucial tool in the field of finance. According to Dharen Kumar Pandey and Vineeta Kumari (2021), some researchers have recently assessed the effects of corporate initiatives like mergers and acquisitions, equity and debt issuance, dividends and stock repurchases regulatory changes like board reforms, ESOP, workplace safety, and macroeconomic shocks like COVID-19. (Dharen Kumar Pandey, Vineeta Kumari, 2021)

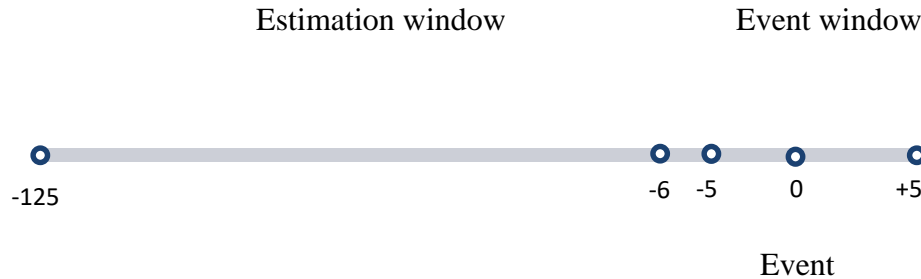
There were no prior event studies conducted on the event "stock repurchase" according to the review of Pakistani event research literature. The investors will be able to gauge the market response, pricing mechanism in place for this event by conducting an event study to look at the stock reaction to the announcement of stock repurchase.

Research Methodology

In this event study, the selected event is "STOCK REPURCHASE," the event date is denoted by 0, the estimation window is from t-125 to t-6 (120 days), the event window ranges from t-5 to t+5 (11 days), and the estimating model is CAR (Cumulative Abnormal Return) model. This event study aims to investigate the return behavior of businesses dealing with a typical event type (stock repurchase). Data on stock prices and the PSX index for the necessary dates was gathered from the PSX website. Each company must have been listed on the PSX for at least three years and comply with trading restrictions, which state that "The sponsors, directors, officers, associated companies, and undertakings of the purchasing companies shall not directly and indirectly trade in shares from 1) the date the board approves the buyback until it is



completed, and 2) the date the board approves the disposal of treasury shares until it is completed" in order to carry out stock repurchases. Event day is the day that the company makes a public announcement (announcement day).



Data from seven corporations that announced stock repurchases between May 2022 and February 2023 were included in this study. The datasets of share prices for the pertinent dates and PSX index were needed for the first phase. Using the model shown below, returns based on share prices and the PSX index were calculated:

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

Where, \ln is natural logarithm; P_t is the current stock price; and P_{t-1} is the stock price of previous trading day.

Estimation of Normal Returns

Using the information from the estimation window, the normal returns are determined. The ordinary least squares market model, out of all the models, yields the best outcomes. The OLS market model shown below was used to regress the predicted normal returns:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt}$$

Where,

α_i and β_i are intercept and slope coefficients respectively of the OLS regression model

R_{mt} is the rate of return on the benchmark index PSX.



Abnormal Returns

Abnormal Returns are obtained by deducting the actual return from the anticipated return on the stock of a certain firm, daily abnormal returns for each company are determined as follows:

$$AR_{it} = R_{it} - E(R_{it}),$$

Where,

R_{it} is the actual return on the day t for security i .

AR_{it} is the abnormal return on security i on day t ;

$E(R_{it})$ is the (expected) normal return on security i on day t

Aggregation of abnormal returns

The cumulative abnormal returns are calculated to fully account for the impact of the event on the share prices, and the abnormal returns of each day for each security are aggregated to analyze the common reaction of the stock to the event.

$$CAR(t_1, t_n) = \sum_{i=1}^n AR_{it}$$

Cumulative Average Abnormal Return(CAAR)

The cumulative average abnormal returns are then determined using the average abnormal daily returns. For the test window, this analysis offers both the cross-sectional and the time-series aggregate.

$$AAR(t) = 1/N \sum_{i=1}^n AR_{it}$$

Where, AAR_t indicates average abnormal returns on day t .

The CAR technique may be simple to understand and put into practice, but it is also prone to errors because it relies on the estimating window's parameters being stable enough to be used in the test window to calculate expected returns. The test window is maintained brief to gauge the market's initial reaction to the announcement of stock repurchases made around the event.



However, according to Fama (1998), "For many events, long periods of unusual prevent returns are prevalent. Therefore, it can be difficult to choose a normal time to calculate a stock's projected return or market model. Observation over a long horizon of abnormal returns is advised by Baber and Lyon (1997).

Hypothesis

H0: The event of stock repurchase does not have any relationship with the abnormal returns

H1: The event of stock repurchase does have a relationship with the abnormal returns

The specification on the direction of stock reaction to the announcement of the stock repurchase is expected both ways. Thus a two tailed test will be used to determine the result of the event on stock return.

Discussion and Analysis

Despite being well-designed, traditional financial theories were unable to account for market disturbances. These abnormalities occasionally manifested in stock market bubbles, under reactions, overreactions, and reversals. The pioneering work in this field is credited to psychologists, who developed the prospect theory to analyze decision-making in the face of uncertainty and established the theoretical foundation for behavioral finance. The CAPM offers a security's predicted returns at a specific moment but does not explain those returns over a period of time that might have been the cause of a stock market bubble.

Due to the nature of an efficient capital market, abnormal returns cannot be generated based on historical patterns or any other publicly available data. The average anomalous returns will therefore fluctuate about zero if there is no unusual fluctuation in the stock's return around the event date, indicating that stock repurchase holds no information. However, there would be a positive or negative movement in the average abnormal returns around the event date if the investors already know the news immediately before the event and take action on it.



Table 1

	NETS OL	MAP LE	LUC KY	ALFA LAH	KOH AT	ENG RO	KTM	SUM	AVG	TSTA TS	CAR	TSTA TS
- 5	- 0.017 65	- 0.031 03	- 0.002 73	- 0.0125 8	- 0.010 06	- 0.010 8	0.052 341	- 0.032 5	- 0.004 64	- 1.694 76	- 0.00464 35	- 3.598 22
- 4	0.002 146	0.016 55	- 0.001 15	-0.0165	- 0.023 86	0.004 36	0.021 058	0.002 617	0.000 374	- 0.077 41	- 0.00426 97	- 3.509 43
- 3	0.006 087	0.021 354	0.005 979	0.0088 94	- 0.011 42	- 0.008 63	0.007 756	0.030 022	0.004 289	1.184 556	1.9126 E-05	- 2.490 85
- 2	- 0.001 87	- 0.017 88	- 0.001 53	0.0057 81	- 0.017 1	0.015 383	- 0.018 38	- 0.035 6	- 0.005 09	- 1.837 37	- 0.00506 68	- 3.698 75
- 1	0.001 466	0.011 449	- 0.005 71	0.0302 99	0.070 374	0.026 114	0.010 433	0.144 423	0.020 632	6.452 703	0.01556 5	1.201 286
0	0.012 714	- 0.027 68	- 0.006 51	0.0607 88	0.044 273	0.007 753	0.034 344	0.125 687	0.017 955	5.589 938	0.03352 03	5.465 656
1	- 0.036 32	0.018 349	- 0.008 8	- 0.0123 3	0.039 531	- 0.015 64	0.010 139	- 0.005 07	- 0.000 72	- 0.431 38	0.03279 607	5.293 652
2	0.007 875	- 0.007 5	0.011 757	- 0.0074 2	- 0.058 41	- 0.001 71	- 0.041 12	- 0.096 53	- 0.013 79	- 4.642 96	0.01900 657	2.018 656
3	- 0.031 92	- 0.006 65	- 0.005 23	- 0.0123 8	- 0.011 5	0.022 182	0.005 553	- 0.039 99	- 0.005 71	- 2.039 36	0.01329 402	0.661 93
4	0.033 533	- 0.003 2	- 0.007 41	- 0.0138 2	- 0.017 65	- 0.002 59	- 0.021 71	- 0.032 85	- 0.004 69	- 1.710 72	0.00860 098	- 0.452 66
5	0.002 568	- 0.018 7	0.001 729	- 0.0041 5	- 0.020 02	0.023 199	0.002 438	- 0.012 93	- 0.001 85	- 0.793 22	0.00675 423	- 0.891 26

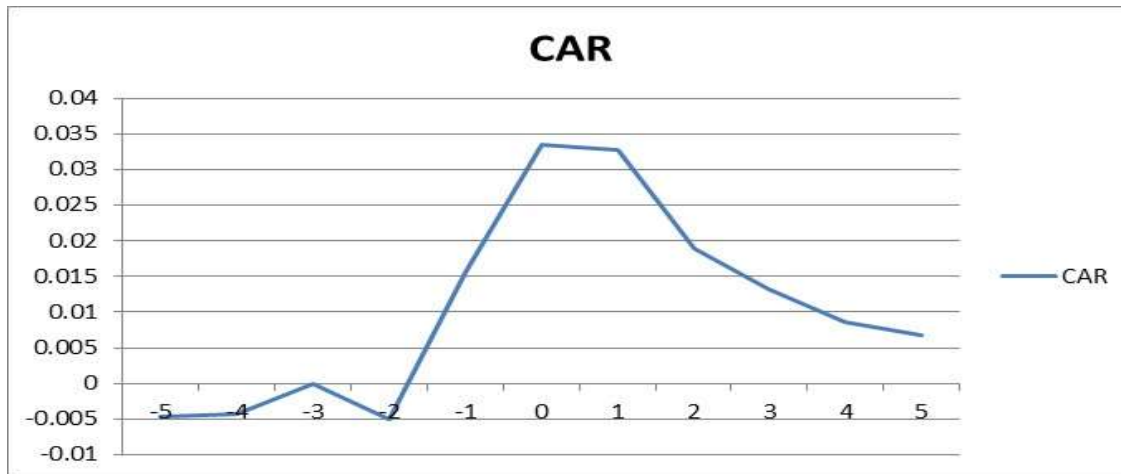


The t-value column in the table above represents the t statistics associated with the abnormal returns and cumulative abnormal returns. The values are used to test the hypothesis. To decide as to whether the t-value is significant, that is falling in the critical region or elsewhere. A high absolute t-value suggests a greater deviation from the expected value and average abnormal returns have just not happened by chance.

Cumulative abnormal returns which similarly indicate accumulated deviation from expected value over a specified period, a significant t-value indicates that cumulative abnormal returns are unlikely to occur by chance, but are attributable to the factors associated with stock's reaction to the news "stock Repurchase".

The AARs and t-statistic during the test period (t-5 to t+5) are shown in the aforementioned table. The table shows that AAR was always negative (insignificantly positive on t-3) before to the event date, but suddenly spiked on t-1, indicating information leakage. The critical value for a two-tailed test turns out to be 2.447 given the 7 observations and 6 degrees of freedom associated with this data. Although the average returns have been continuously declining since the event date, indicating correction, the t-statistic for the pre-announcement has no significant value at the 5% level of significance. However, when matched with the t-statistic, day 0 and day 1 have significant positive values. It is unimportant on all other days following the announcement. Only for t-1, which denotes outcomes greater than the critical value, the t statistic prior to announcement day has significance. This indicates that there was a high of unusual returns a day before the announcement date and correction coming immediately after this date, clearly indicating market inefficiency, at least semi-strong form inefficiency. It is therefore inferred that the null hypothesis at 5% level of significance is rejected.

Figure 1



The efficient market theory is not supported by the graph. After the announcement, the CAR should stay quite flat. The fact that the CAR increased significantly the day before the announcement suggests that there may have been a leak of information, that investors may have anticipated the news, or that insider trading may have taken place, allowing for abnormal gains for investors. The CAR decreased gradually the following day before dwindling to lesser levels throughout days one through five. Such fluctuations go against the efficient market hypothesis (EMH) in its semi-strong form since they allow for abnormal profits to be made by investors even while the stock prices keep falling. Therefore, the null hypothesis is rejected, and it is concluded that PSX is not semi strong form efficient market.

Conclusion and Recommendation

This study aims to look into the impact of news, namely the announcement of a stock repurchase, on the firm's stock's return. For the analysis, daily returns of publicly listed shares on PSX from (seven corporations that made repurchase announcements from May 2022 to February 2023) are used as the data source. The test window duration is from -5 to +5(11days), while the estimation window is from -125 to -6 (120days). Expected stock returns are predicted using the market model and the intercept and slope coefficient of an OLS regression is obtained.

A sudden increase in CAR just one day before the announcement suggests information leakage or insider trading, providing arbitrage opportunities from day -1 to day 5, and clearly violating the semi-strong form of the efficient market hypothesis (EMH). CAR before the event suggest



that investors have a negative reaction to the news. Thus, it is determined that the event stock buyback is significantly related to anomalous returns and thus the null hypothesis is rejected. This study is restricted to just one event, stock repurchase for the PSX-listed companies which announced repurchase. This is a first ever research on how stocks' returns respond to news about stock purchases. The less frequent event on the PSX is stock repurchases, and as a result, reactions may not be entirely sensible from investors. The findings, however, point to a breach of a market with a semi-strong type of efficiency. Data sparseness may also contribute to this type of CAR behavior. Many additional studies involving a big number of businesses are required in order to provide conclusive evidence regarding the efficiency or lack thereof in this market.

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