# Impact Of Monetary Policy Announcements On Stock Prices: Evidence From Pakistan Stock Exchange

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**Abstract**

This study examines the impact of monetary policy announcement on stock prices listed on Karachi stock exchange for the period 1998-2012. The Monetary policy announcements are extracted from the report published by the State bank of Pakistan from 1998 to 2012 and KSE-100 index prices. Forty-two monetary policies were announced during this period of study. This study used an event study consists of an event window of 21 days and a simple t-test has been applied to test the statistical significance of the returns generated. We use the market model to estimate the abnormal returns (AR) and cumulative average abnormal returns (CAAR) around the monetary policy announcement dates for these securities. The results reveal that policy announcements do generate AR, CAAR and prove to be significant. The finding of research indicates that the Efficient market hypothesis does not hold for the Pakistani stock market and shows market in-efficiency.

**Key Words:** Abnormal returns, Cumulative average abnormal returns, Market efficiency, Pakistan.

## 1.  Introduction

The efficient market hypothesis states that the investor's reaction is very divergent when they are expecting alternative trends in the stock market. However, it creates a kind of market environment wherein a long run; a single investor cannot exploit the market. In other words, the hypothesis of the efficient market creates perfect competition in the market. This hypothesis is based on the random walk theory and the fundamental reason behind this is that the available information in the market has no connection with stock price changes. In estimating a macroeconomic model, it is better to incorporate financial market efficiency because without considering the efficiency of the market the estimation model produces misleading results (Mishkin, 1981).

If the stock market follows the EMH, then it becomes difficult for a portfolio manager to help an investor to earn an abnormal profit. Efficient market hypothesis by Fama (1965), market has been classified into three types in terms of efficiency: strong form, semi-strong form and weak-form efficient market. The market is perfectly efficient when stock price immediately captures the available relevant information in the market. Furthermore, in an efficient market the effect of an event is considered significant it the prices show non-random movement immediately after the event. This study can measure the level of efficiency by checking the type of information and speed of market reaction against new or uncertain information.

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However, event study has a property that measures the impact of specific information on stock prices.

Monetary policy is a tool for a policymaker to stabilize and promote the economy. In Pakistan, the objective of monetary policy by the SBP Act of 1956 is to achieve the annually targeted inflation and growth. Moreover, the ultimate objectives of monetary policy are the stability of prices, maintain full employment and promote economic performance. These objectives can be achieved by controlling inflation in a country. Open market operations, discount rate, reserve requirement and nominal interest rate are tools of monetary policy to achieve targeted goals. The announcement of monetary policy is an important phenomenon for the economy but there was no regular meeting schedule of the monetary policy committee of the central board till 2005, and after 2005, the committee conducted regular meetings (Rahman and Mohsin, 2011). The relationship between stock prices and monetary policy has been of interest for the researcher because stock prices are more sensitive to economic and political changes. Stock prices get influence through the short-term interest rate, rate, which act as a tool for monetary policy transmission. Because short-term and long-term interest rates settle the change in money and borrowing cost (Rigobon and Sack, 2003). As stock market reactions are quick to incorporate outside information, therefore, by using financial data, we can measure the immediate effect of change in monetary policy. In the stock market, stock prices are considered highly sensitive to changes in economic conditions. Hence the study of the reaction of stock prices against monetary policy announcement will help to understand the behaviour and impact of monetary policy (Ioannidis and Kontonikas, 2007).

Theoretically, the discounted cash flow model state that the price of the stock is equal to the present value of expected future cash flows. So monetary policy is important in determining the equity return through shifting the discount rate. By this alteration in the discount rate, it can influence the expectations of the market participant about future economic activity. So, a restrictive monetary policy will lead to a higher discount rate that ultimately lowers the future cash flow. In other words, a tight monetary policy relates to lower stock prices and a higher discount rate or lower expected future cash flow. Hence an expansionary policy will be a good sign by the market participant that it relates to higher economic activity, low-interest rate and higher economic profit in the future. For this reason, the financial participant pays close attention to monetary policy decisions and translate the movement in the stock price as a reaction to the monetary policy announcement. They interpret the bullish trend of the stock market as a low-interest rate.

Finding the monetary policy relationship with the stock market has been the focus of financial economists. A few studies are available that have empirically investigated the relationship like Jensen and Johnson (1995), Conover et al. (1999), Mahmood and Husain (1996) and Habibullah (1998) investigated the relationship of monetary policy and the stock market. On the other hand, Rigobon and Sack (2004) and Li, et al. (2010) examined the reaction of stock prices to changes in monetary policy. Moreover, Kearns et al. (2006) and Rehman and Mohsin (2011) measured the impact of policy announcement on the stock market.

## 2. Contextual Analysis and significance of the Study

There are scant studies available that have focused on Pakistan for measuring the monetary policy announcement impact on the stock market. Recently, Qayyum

and Anwar, (2011) tested the impact of monetary policy on stock market volatility, also Rehman and Mohsin, (2011) analysed the impact of monetary policy announcement on stock return. Our research is focusing on; to measure the impact of the announcement of monetary policy on stock price in Pakistan. This study is a contribution in the existing literature in this regard. According to the best knowledge of a researcher, no study is available that has measured the stock price reaction against the policy announcement in Pakistan. Our research study is trying to fill this gap in Pakistan.

Results of this study would provide the true picture to investor and investment managers to consider the monetary policy announcement days for taking the returns in future and take decisions accordingly. As in any country, stock markets play an important role in assessing the economic condition of the country. Stock markets fulfil the capital requirement needed for the other industrial sector which ultimately benefits the economy. Previous researches; Haque et al. (2010), Akbar and Baig (2010), Hamid et al. (2010) and Jafari (2011) through their estimated results showed that Pakistani market is the market that intake the new information and arbitrageur can earn an abnormal return by considering the available information.

## 2.1 Aim of the study

Hence the focus of our study is to investigate the response of stock prices during scheduled meetings and uncertain announcement by the monetary policy committee (central board of directors). The researcher wants to examine whether these meetings have a measurable (significant) impact on stock prices or not.

## 3. Literature Review

Eugene Fama introduced the word efficient market in the early 60s. He defined the term efficient market as "it is the market which quickly adjusts itself with new information coming in a market. Jafari, (2011) tested market efficiency of a stock market of Kuwait by taking daily data of stock prices for period 2001-2010. He used the ADF test for unit root, Phillips-peron test, and serial correlation test and proved the weak-form efficiency in Kuwait. Hamid et al. (2010) investigated the weak form efficiency of Pakistani stock market by taking monthly data of KSE 100 index, and the result of their study shows the arbitrage opportunities for the investor. Akbar and Baig (2010) studied simultaneous cash and stock dividend announcements and rejected the semi-strong form market efficiency exist in KSE Pakistan. Ali, et al. (2010) investigated the relationship of stock prices and macro-economic indicators in Pakistan and based on results reported no causal relationship. This means that macroeconomic variables have no impact or relationship with stock prices. Butt et al. (2010) studied the economic variables and found that variations in stock returns are due to economic variables. Furthermore, in the same economic condition different firm's stock return behaves in different manners.

## 3.1 Relation of Monetary Policy and Stock Price: empirical evidence

The monitory policy relation with stock price and its impact on asset prices have been the point of discussion for a researcher. Jensen and Johnson (1995) tested the performance of the stock market and found that expected stock returns are greater in time of expensive monetary periods. Later on, Conover et al., (1999) conducted the cross-country comparison and supported the inferences of Jensen's study by deducing the same results. Rigobon and Sack (2004) measured the response of asset price when monetary policy changes. They have used

heteroskedasticity-based measure and found that monetary policy has a negative impact on stock prices. Bomfirm (2003) studied the volatility of the stock market with respect to monetary policy in two dimensions. First volatility of the stock market in the days of the scheduled meeting and second, stock market volatility in the days of actual decisions and found that market response is different in schedule and un-schedule meeting. Yao et al. (2011) studied the long-run relationship of asset prices and monetary policy by using the VAR and Granger causality test in China. They found a little immediate effect on stock prices by monetary policy.

There are other studies in the existing literature that present a relative link between the monetary policy and stock prices. Rigobon and sack (2004) recorded a decline of 1.7 per cent in S&P-500 and 2.4 per cent in Nasdaq index after an increase in 25 basic points in a three-month interest rate. Corallo (2006) in Germany and U.K, using the heteroskedasticity based approach calculated the impact of monetary policy on stock prices. The result of this study shows that an increase in the interest rate causes to decrease in equity price but this relationship is not significant. Another study in USA and Canada estimated the significance of stock prices in the transmission of domestic monetary policy shocks. They used VAR model to estimate the impulse response and concluded that an increase in the 25 basic points in the instrument interest rate brings a 4 per cent decline in the stock price within thirteen months aftershock and 0.8 per cent in four months after the shock in USA and Canada respectively. Based on the above results, they documented that interest rate response prolonged in the USA but is rapid in Canada (Li, et al., 2010). One of the main functions of the central bank is to promote monetary policy and price stability. These can be promoted by managing the policy rates, buying and selling of securities, repurchase transaction bills, discount window operations and pledges and open buy back (Aliyu et al., 2011). Previous researchers witness that monetary policy news is a contributing factor in the change in stock prices (Fair, 2002). Kearns et al., (2006) by using the intra-day data for four countries evaluated the effect of monetary policy on the exchange rate. They found the slight impact of monetary policy information on an exchange rate.

Mahmood and Husain (1996) examined the causal relationship between money supply and stock prices by using the data from 1991 to 1999 and found a long-run relationship between these two. Furthermore, the study of Habibullah (1998) conducted a study on the Malaysian economy provide evidence of a causal relationship between money supply and stock return. According to Qayyum, Pakistan's stock market is sensitive to the change in monetary policy. For this purpose, bi-variant EGARCH method was used. Ehrmann and Fratzscher, (2005 ) studied the effect of monetary policy on stock return in the U.S and concluded that a tightening of monetary policy by 50 basis point brings the decrease of 3 per cent in stock return on average. Also, uncertain monetary policy changes have a greater impact on stock return.

Agha et al. (2005) studied the transmission process of monetary policy decisions in Pakistan using a vector auto-regression technique. They concluded that monetary tightening has a negative relation with domestic demand that ultimately reduces the price level with a lag. Hussain and Javaid, (2009) by using the multivariate co-integration analysis and Granger causality studied the relationship of equity prices and monetary variables. The macroeconomic variables

taken in this study are; money supply, foreign exchange rates, treasury bill rates, and the consumer price index. After analysis, they found a long-term and short-term relationship between macroeconomic variables and equity prices.

Rehman and Mohsin, (2011) through event study methodology analysed the impact of monetary policy announcement on stock return and interest rate. For analysis, 31-day event window and 250 days estimation window were used for estimation. After analysis, they concluded the significant short-term and long-term relationship between stock return and interest rate. They also applied the ARIMA model for the estimation of return. A similar impact is measured by Bredin et al. (2007) in an event study. They used the under the mentioned model to measure the impact of an expected and surprising change of policy rate on stock returns and result of this study shows a significant impact of monetary policy on sectoral stock return.

In the event study to measure the impact of event announcement (merger and acquisitions) on security returns, Ma et al. (2009) study's result about the stock market reports positive abnormal return to the event windows. The finding of the study also reports that managers can reap the abnormal financial benefits associated with the event announcement. Haque et al. (2010) proved that Pakistani stock prices are not a weak form efficient by examining the weakly KSE-100 index over the period 2000 to 2010. In this paper, we are going to identify the hindsight bias in the broker and finance students by assuming that the market is inefficient. By conducting this research, we would be able to comment on the relationship of hindsight bias and Pakistan's stock market.

Normal return is the expected return without any event took place. Three approaches are used to model the normal return; one is the single-index model (constant mean return model). The assumption of this single-index model is that the mean return remains constant for the given security. The second approach is the market model approach; which assumes a stable linear relation between security return and market return. The third approach is the CAPM model. The assumption of the CAPM model is that the expected return of a given asset is a linear function of its covariance with the return of the market portfolio but the CAPM model has a limitation of risk-free return in the estimation of normal return and due to this limitation, CAPM is not used in event studies (Ma et al., 2009). Therefore, previous studies have given preference to market model on CAPM in estimation normal return.

The following hypotheses are therefore selected based on literature review:

$H_0$: there is no impact of the event on stock prices in Pakistan

$H_1$: there is an impact of the event on stock prices in Pakistan.

## 4. Methodology
### 4.1 Sample Selection
In this study, a researcher analysed the reaction of stock prices against the announcement of monetary policy. For this purpose, data of KSE-100 index was collected from 1998 to 2012 from the official website of Yahoo finance and monetary policy announcement dates spanning 1998-to-2012, were collected from the official website of the state bank of Pakistan. An event study approach is used to observe the abnormal returns around the monetary policy announcement date introduced by Brown and Warner (1985).

The selection of event window is an empirical issue, a window that is too long will absorb the impact of other events that are not of interest in this study and a window that is too short will not be able to analyse the effect of an event. To avoid the impact of other events on our study, event window of 43 days has been used in the estimation of return about which 21 days before and 21 after the monetary policy announcement and one day of announcement day.

If residuals of regression are normally distributed and test statistic's values are greater than 1.96, then the value of abnormal returns would be significant and this significance would be at 95 per cent significance level. In other words, the chances of an abnormal return to be random and significant are less than 5 per cent.

## 4.3 Data analysis techniques

A researcher calculated the actual return of the specific period and then average return around each specific policy announcement for calculating the abnormal return. Standard deviations were calculated for estimating CAARs and T values. T values then were compared to the critical value (1.96). At the first stage, daily stock returns were calculated by taking the log of daily closing prices is calculated as

$$R_{it} = \ln(P_t / P_{t-1}) _____(1)$$

After that abnormal returns received by having the difference of actual return and average return:

$$ARit = Rit - AvgRevent _____(2)$$

And the average abnormal return is calculated as:

$$AARt = \frac{1}{N} \sum_{i=1}^{N} ARit _____(3)$$

Then cumulative abnormal returns were calculated by following formula:

$$CAARi = \sum_{i=0}^{n} AAR _____(4)$$

T-values calculated for checking the significance of CAAR values:

$$T = CAARi / S.D _____(5)$$

## 5. Results and discussion

### Table 1: Average Abnormal Returns (AABR) and Cumulative Average Abnormal returns (CAABR) for Overall KSE 100 index.

| Day | AAR | S.D | CAARs | T-Values | Day | AAR | S.D | CAARs | T-Values |
|-----|-----|-----|-------|----------|-----|-----|-----|-------|----------|
| -21 | -0.0009 | 0.0182 | -0.0369 | -2.032** | 1 | -0.0031 | 0.0674 | -0.1328 | -1.971** |
| -20 | -0.0078 | 0.0662 | -0.3357 | -5.069*** | 2 | 0.0016 | 0.0402 | 0.0709 | 1.763 |
| -19 | 0.0032 | 0.0289 | 0.1393 | 4.818*** | 3 | 0.0027 | 0.0296 | 0.1153 | 3.897*** |
| -18 | 0.0058 | 0.0505 | 0.2509 | 4.965*** | 4 | 0.0025 | 0.0395 | 0.1087 | 2.752*** |
| -17 | 0.0023 | 0.0265 | 0.0971 | 3.660*** | 5 | -0.0023 | 0.0221 | -0.0999 | -4.510*** |
| -16 | 0.0020 | 0.0212 | 0.0875 | 4.133*** | 6 | -0.0064 | 0.0556 | -0.2742 | -4.929*** |
| -15 | -0.0011 | 0.0387 | -0.0489 | -1.263 | 7 | -0.0025 | 0.0178 | -0.1056 | -5.920*** |
| -14 | 0.0001 | 0.0362 | 0.0043 | 0.119 | 8 | 0.0023 | 0.0431 | 0.0976 | 2.266** |
| -13 | 0.0020 | 0.0290 | 0.0869 | 2.992*** | 9 | 0.0004 | 0.0422 | 0.0189 | 0.447 |
| -12 | -0.0002 | 0.0483 | -0.0070 | -0.144 | 10 | 0.0018 | 0.0528 | 0.0787 | 1.490 |
| -11 | -0.0037 | 0.0367 | -0.1600 | -4.355*** | 11 | 0.0038 | 0.0511 | 0.1641 | 3.214*** |
| -10 | -0.0031 | 0.0657 | -0.1323 | -2.012** | 12 | 0.0041 | 0.0474 | 0.1774 | 3.741*** |
| -9 | 0.0010 | 0.0353 | 0.0435 | 1.232 | 13 | -0.0008 | 0.0262 | -0.0362 | -1.382 |
| -8 | -0.0002 | 0.0161 | -0.0066 | -0.411 | 14 | -0.0038 | 0.0623 | -0.1655 | -2.655*** |
| -7 | 0.0035 | 0.0511 | 0.1516 | 2.963*** | 15 | -0.0022 | 0.0538 | -0.0957 | -1.778 |
| -6 | -0.0006 | 0.0251 | -0.0250 | -0.994 | 16 | -0.0008 | 0.0536 | -0.0344 | -0.641 |
| -5 | -0.0023 | 0.0415 | -0.0991 | -2.387** | 17 | 0.0007 | 0.0244 | 0.0286 | 1.169 |
| -4 | 0.0012 | 0.0382 | 0.0532 | 1.392 | 18 | -0.0008 | 0.0359 | -0.0339 | -0.943 |
| -3 | 0.0023 | 0.0444 | 0.0999 | 2.248** | 19 | -0.0006 | 0.0260 | -0.0238 | -0.914 |
| -2 | -0.0021 | 0.0190 | -0.0907 | -4.77*** | 20 | -0.0018 | 0.0312 | -0.0773 | -2.477** |
| -1 | 0.0015 | 0.0121 | 0.0660 | 5.454*** | 21 | 0.0007 | 0.0291 | 0.0301 | 1.0323 |
| 0 | 0.0012 | 0.0279 | 0.0513 | 1.841 | | | | | |

** and *** indicate 5%, & 1% significance levels.

## 5.1 Result Discussion

The above table showing the values of average abnormal returns, cumulative average abnormal return, and standard deviations of monetary policy announcement of 43 days, i.e. -21 days before the announcement "0" day as announcement date and +21 days after the policy announcement. It is clear from the values of average abnormal return, which were negative about ten days before the announcement and were negative 11 days after the announcement of monetary policy, and cumulative abnormal return follows the same pattern. It is also evident from the above results that average abnormal return was negative right after the event day. The values of average abnormal returns were positive for three days with significant values after two days of the announcement day. This shows that the market is reacting after two days of the event day but the t-test value on the event day (policy announcement date) is insignificant having value 1.84. t-stat value was significant about fourteen days out of 21 days before the announcement and was significant about eleven days out of 21 days after the event date. Through the T-test values, the market is reacting on the third day after the occurrence of the event, and the reaction of the market is negative to monetary policy announcement.

## 6. Conclusion

This investigation that abnormal returns and cumulative average abnormal returns using the market model of KSE was statistically significant and responded to the stated event. Due to these finding, we accept the alternative hypothesis and reject the null hypothesis. In addition, these returns were negative for most of the days for both AAR and CAAR using the market model. This indicates that the information has a significantly negative effect on the market. Thus, the market fails to capitalize on public information. These results reveal that investor can earn excess abnormal returns by applying fundamental analysis and Karachi stock exchange show inefficient behaviour. The negative relationship indicates that there is high volatility in the market. The results of this study are consistent with the existing literature (Jensen and Johnson (1995), Bernanke and Kuttner (2004), Iaonnidis and Kontonikas (2007) and Hojat (2015) that policy announcements had the significant inverse relationship between these variables.

There was no regular meeting and announcement schedule up-to 2007 and there was the absence of policy meetings between years 2002 to 2005 (Rehman,H. and Mohsin, H. 2011). It can be concluded from previous studies, the Pakistani market is suitable for arbitrageurs due to the prior leakage of information (Subayyal & Shah, 2011). Moreover, results also confirming the sensitiveness of the stock market for the macro announcement in the economy.

## 7. Recommendations

The suggestion of the study is that investor should take preventive steps before trading in the stock pre and post period of policy announcements. Governments should take steps against market in-efficiency during such kind of events. Due to limited time resources and unavailability of full and proper data, the study selected monetary policy announcements and KSE 100 index. The researchers may also take fiscal policy announcements to test their impact on stock prices.

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