

Behavioral Biases and Market Reaction to Public Information

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Abstract

This study examines the impact of behavior biases, public announcements and information asymmetry on the stock market reaction in the context cement sector companies listed on Pakistan Stock Exchange (PSX) during the period of 2018-1023. The dependent variable of the study is cumulative average abnormal return (CAAR). The independent variable of the study are public announcements which is measured through different types of disclosures such as earnings announcements, dividend declarations, mergers, and other corporate disclosures. The other variable is Information asymmetry which is measured using the bid-ask spread and Albert S. Kyle price impact model. Behavioral biases are measured using proxy variables such as herding behavior which is captured through concurrent trading patterns and unusual increases in trading volume around the announcement period. Investor sentiment is analyzed through media tone, analysts' reports, and overall media coverage. Regression analysis has been used to determine the relationship between information asymmetry, investor behavior and stock price adjustments. The results of the study show that information asymmetry has a positive and statistically significant relationship with the dependent variable, cumulative average abnormal return (CAAR). Similarly, public announcements, behavioral biases and liquidity have been found to have a positive and significant relationship with the dependent variable. However, firm size shows a negative but statistically significant relationship with CAAR, indicating that larger firms experience relatively smaller abnormal returns. The R-square value of the model is 0.47, which indicates that 47% of the variation in the dependent variable (CAAR) is explained by the independent variables included in the study. These findings contribute to the literature by

demonstrating that market efficiency is affected not only by public information but also by differences in investor interpretation and cognitive biases. The study underscores the need to consider both informational and behavioral factors when analyzing stock market reactions to public disclosures.

Keywords: CAAR, Public Announcements, Behavioral Biases, Information Asymmetry

Introduction

Information asymmetry refers to a situation in which one party in a transaction possesses more or better information than the other. This phenomenon is especially prevalent in financial markets, where company insiders often have access to material information that is not publicly available. Such disparities can lead to pricing inefficiencies, as investors are forced to make decisions based on incomplete or delayed information. Public announcements, such as earnings reports, mergers and acquisitions, or regulatory changes, serve as critical channels for disseminating information to the broader market. The impact of these announcements on stock returns is a vital area of study, as it influences investor behavior and has broader implications for market efficiency and economic performance.

This research aims to explore how public announcements mitigate the effects of information asymmetry and facilitate price adjustments in stock markets. By examining the relationship between the timing and content of these announcements and subsequent stock price movements, the study seeks to enhance understanding of market dynamics and the role of information dissemination in financial decision-making.

In financial markets, the efficient assimilation of information into asset prices is a cornerstone of the Efficient Market Hypothesis (EMH). However, the presence and persistence of information asymmetry where some market participants possess superior information, complicates this process. A key area of inquiry in financial economics involves examining how public announcements, intended to broadly disseminate information, interact with existing informational imbalances and affect price adjustments and overall market behavior.

Contrary to the intuitive expectation that public information uniformly reduces information asymmetry, a growing body of literature reveals a more nuanced and often paradoxical reality: public announcements can sometimes increase information asymmetry. This occurs because even when information is released to the public, its interpretation and strategic use may vary across investor groups. In this way, public signals can inadvertently become a source

of private advantage for more sophisticated or better-informed participants. This complexity is evident across various forms of disclosure. For example, operational risk announcements, which are typically unscheduled and unexpected, often exacerbate information asymmetry between firms and investors. This can lead to increased trading costs and greater price impact, particularly in firms with weaker corporate governance. Similarly, routine macroeconomic releases, such as oil inventory reports, can heighten information asymmetry and stimulate increased trading activity. This occurs not necessarily due to the news content itself, but because such releases attract the participation of informed, risk-averse investors.

Additionally, the well-documented rise in information asymmetry surrounding earnings announcements underscores how even scheduled disclosures aimed at promoting transparency can create opportunities for informed trading. The interaction between information, investor behavior, and market efficiency is also influenced by factors such as investor time horizons and market microstructure. The coexistence of short-term traders and long-term investors can significantly affect liquidity and price efficiency in response to public disclosures.

Understanding these intricate relationships, how various types of public announcements reshape the informational landscape and drive subsequent price adjustments, is essential for a deeper comprehension of financial market dynamics and the ongoing evolution of market efficiency.

Literature Review

The idea of asymmetric information is very important in finance. It refers to a situation where some market participants have more or better information than others. When one group has an information advantage, the less informed group may face losses or make poor decisions because they do not have the same level of knowledge. This concept was first clearly explained by George Akerlof in his 1970 study, *The Market for Lemons*. He argued that when buyers and sellers have unequal information, markets do not function efficiently. In some cases, this difference in information can even lead to market failure.

In financial markets, information asymmetry affects investor confidence and may cause securities to be priced incorrectly. Robert C. Merton (1987) explained that when investors do not have enough information about firms, share prices may not fully reflect their true value. Similarly, research by David Easley and Maureen O'Hara (2004) showed that higher levels of information asymmetry can increase the volatility of a firm's financial assets compared to the overall market.

Public announcements play a very important role in reducing the information gap in financial markets. When companies share information with the public, it helps investors make better and more informed decisions. The Efficient Market Hypothesis (EMH), developed by Eugene Fama in 1970, states that stock prices reflect all available information. This means that when new information becomes public, it is quickly included in stock prices.

Many studies, including the work of S. P. Kothari (2001), emphasize that company announcements are taken very seriously by investors. When firms release information—such as earnings reports, dividend announcements, mergers, or other corporate disclosures—investors update their expectations about the company's future performance. As a result, they adjust their investment decisions, and stock prices change accordingly.

However, public announcements do not always reduce information asymmetry. In some situations, the release of financial information through different types of reports can actually increase the information gap in the market. Although information becomes publicly available, only investors who have the skills and ability to properly analyze and interpret it can fully benefit from it. Skilled investors can better understand financial reports and predict future price movements or changes in demand and supply. On the other hand, less experienced or less technically skilled investors may not be able to use this information effectively.

As a result, differences in interpretation can increase trading activity in the market. In such situations, market makers may widen the bid-ask spread to protect themselves from traders who have better information and analysis. This can further reflect the presence of information asymmetry in the market. Stock returns and overall market behavior can react differently to the same or different types of announcements. Research by Stephen J. Brown and Jerold B. Warner (1985) shows that stock returns often experience abnormal changes around the dates of important announcements. This means that prices may move unusually compared to their normal pattern when new information is released.

According to Wei Jiang and colleagues (2011), positive news generally increases share prices because it creates a favorable perception among investors. As a result, investors are more likely to buy the company's shares. In contrast, negative news usually leads to a decline in share prices.

Furthermore, the speed and size of price changes depend on market conditions and investor sentiment. For example, Paul C. Tetlock (2007) found that the tone of media coverage and the overall mood of investors can influence how strongly and quickly markets respond to new information. Behavioral scientists believe that investors do not always act rationally. This is

why understanding investor behavior is important for explaining how stock prices move and adjust.

Cognitive biases and emotions can cause investors to overreact or underreact to new information. Barberis N. and colleagues (1998) explain that psychological factors can create patterns in stock returns that are somewhat predictable. Similarly, Andrea Devenow and Ivo Welch (1996) highlight an important cognitive behavior called **herding**, where investors follow trends or the actions of others rather than relying on other relevant information. Herding can amplify price movements, especially during uncertain times in the market.

Information asymmetry is commonly measured through market microstructure indicators such as the bid-ask spread and the price impact of trades. The bid-ask spread reflects the compensation that market makers require for the risk of trading with better-informed investors. A wider spread indicates a higher level of perceived information asymmetry. Models such as the one developed by Albert S. Kyle (1985) explain how informed traders strategically trade on private information and influence price formation.

Overall, the literature shows that the relationship between information asymmetry, public announcements, and stock returns is complex. Public announcements help reduce information gaps, but they may also create new differences in interpretation among investors. The market reaction depends on the type of announcement, the level of uncertainty, investor sentiment, and trading behavior. Therefore, understanding these factors is essential for analyzing how stock prices adjust to new information and for evaluating market efficiency. This study builds on existing research to further examine these relationships and contribute to a deeper understanding of price adjustment in financial markets.

Hypotheses of the study are:

H1: Information Asymmetry (IA) has a significant impact of cumulative average abnormal return

H2: Public Announcements has significant impact on the cumulative average abnormal return

H3: Behavioral Biases has significant impact on cumulative average abnormal return

H4: Firm size has significant impact on the cumulative average abnormal return

H5: Liquidity has significant impact on cumulative average abnormal return

Methodology

This study uses a quantitative research approach. It examines how behavioral biases affect the market's reaction to publicly available information and how

this reaction is influenced by information asymmetry. The main objective is to understand the relationship between different types and timings of announcements, investor behavior, and stock price adjustments.

The population of the study consists of all cement sector companies listed on the Pakistan Stock Exchange (PSX).

Table: Cement Sector Companies

1	Lucky Cement Limited	6	Kohat Cement Company Limited
2	Fauji Cement Company Limited	7	Bestway Cement Company Limited
3	D.G Khan Cement Company Limited	8	Power Cement Limited
4	Attock Cement Pakistan Limited	9	Dewan Cement Limited
5	Dandot Cement Company Limited		

The sample period covers five years, from 2018 to 2023. The study is based on secondary data. Stock prices and return data will be collected from financial records. Public announcements issued by the companies will also be examined. To measure information asymmetry, data on bid-ask spread and trading volume will be used. In addition, investor sentiment data will be included, such as news coverage, media tone, and analysts' reports and opinions.

The dependent variable of the study is cumulative average abnormal return (CAAR) while the independent variables of the study are types of public announcements, information asymmetry indicators and behavioral factors.

Measurement of Variables

The dependent variable of the underlying study is cumulative average abnormal return. The equation used to calculate the normal return is $E(R_{it}) = \alpha + \beta R_{mt} + \epsilon_{it}$. This equation estimates the **expected return** of stock i on day t under normal market conditions. It explains that the expected return of a stock depends on the overall performance of the market on that particular day and the specific stock's sensitivity (β) to market movements.

- $E(R_{it})$ = Expected return
- R_{mt} = Market return, for which the benchmark is **PSX (Pakistan Stock Exchange)**
- α and β = Intercept and coefficient, respectively

On the other hand, the **abnormal return (AR_{it})** is calculated using the following equation: $(AR_{it} = R_{it} - E(R_{it}))$

Where,

- AR_{it} = Abnormal Return

➤ **Rit** = Actual daily return of the security
 Abnormal return is obtained by subtracting the expected return from the actual daily return of the security.

After calculating the abnormal return, the **Cumulative Abnormal Return (CARit)** is calculated for security *i* over the period from *t1* to *t2* using the following equation:

$$CARit = \sum_{t1}^{t2} ARit$$

Next, the **Average Abnormal Return (AAR)** and **Cumulative Average Abnormal Return (CAAR)** are calculated using the following equations:

$$AARi = \frac{1}{N} \sum_{i=t1}^{t2} ARit$$

$$CAARi = \frac{1}{N} \sum_{i=t1}^{t2} CARit.$$

The independent variable, **public announcements**, is measured through different types of disclosures such as earnings announcements, dividend declarations, mergers, and other corporate disclosures.

Information asymmetry is measured using the **bid-ask spread** and **Albert S. Kyle (1985) price impact model**, which explains how informed traders influence stock prices.

Behavioral biases are measured using proxy variables. Cognitive biases, such as **herding behavior**, are captured through concurrent trading patterns and unusual increases in trading volume around the announcement period. Investor sentiment is analyzed through media tone, analysts' reports, and overall media coverage.

Regression analysis will be used to determine the relationship between information asymmetry, investor behavior and stock price adjustments.

Econometric Model of the Study

$$CAARi = \alpha + \beta_1 IA_i + \beta_2 ANN_i + \beta_3 BBI + \beta_4 \text{Firm size } i + \beta_5 LIQUIDITY + e_i$$

CAAR= Cumulative average abnormal return

IA= Information asymmetry for time t for stock i

ANN= TYPE OF PUBLIC ANNOUNCEMENT at time t for stock i

Control Variable= Firm size and liquidity.

Results

The results section presents the empirical findings of the study. Multiple regression analysis was conducted to test the proposed hypotheses and examine the relationships among the study variables. The findings are presented and discussed in the following paragraphs.

Table 2: Results of the Model

Variables	Co-efficient(β)	Standard error	t-test	p-value
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Information Asymmetry (IA)	0.185	0.052	2.98	0.005
Public Announcements (ANN)	0.241	0.071	3.39	0.001
Behavioral Biases (BB)	0.163	0.058	2.81	0.005
Firm Size	-0.094	0.041	-2.29	0.023
Liquidity	0.118	0.051	2.46	0.018
Constant (α)	0.012	0.005	2.40	0.017

R-Square= 0.47 Adjusted R-Square = 0.44 F-Statistics = 14.52

The results of the study show that information asymmetry has a positive and statistically significant relationship with the dependent variable, cumulative average abnormal return (CAAR). Similarly, public announcements also have a positive and statistically significant effect on CAAR. Behavioral biases were found to have a positive and significant relationship with the dependent variable as well.

However, firm size shows a negative but statistically significant relationship with CAAR, indicating that larger firms experience relatively smaller abnormal returns. Liquidity, like most of the other explanatory variables, has a positive and statistically significant relationship with CAAR. The R-square value of the model is 0.47, which indicates that 47% of the variation in the dependent variable (CAAR) is explained by the independent variables included in the study.

Discussion

The findings of this study provide valuable insights into how information asymmetry, public announcements, and behavioral biases influence stock price adjustments in cement sector companies listed on the Pakistan Stock Exchange.

First, the results indicate that information asymmetry has a positive and statistically significant effect on cumulative average abnormal return (CAAR). This suggests that when bid-ask spreads are wider and the price impact of informed trading is higher, abnormal returns around announcement periods increase. These findings align with Kyle's (1985) model, which explains how informed traders strategically affect price formation. Similarly, Easley and O'Hara (2004) argued that higher information asymmetry is associated with greater volatility in asset prices, supporting the observed results in this study. This demonstrates that public disclosures do not entirely

eliminate information gaps; instead, they may intensify market reactions when more informed investors interpret the information efficiently.

Second, public announcements exhibit a positive and statistically significant relationship with CAAR, confirming that earnings, dividends, mergers, and other corporate disclosures contain valuable information for investors. This is consistent with the Efficient Market Hypothesis (Fama, 1970), which posits that stock prices adjust rapidly to publicly available information. The results also resonate with prior research by Brown and Warner (1985), who documented abnormal returns around announcement dates, and Kothari (2001), who emphasized that investors take corporate disclosures seriously and adjust their expectations accordingly.

Third, behavioral biases, including cognitive biases and herding behavior, show a positive and significant relationship with CAAR. This indicates that investor psychology significantly influences market reactions. The findings are in line with Barberis et al. (1998), who suggest that psychological factors create predictable patterns in stock returns. Herding behavior, highlighted by Devenow and Welch (1996), appears to amplify price movements, particularly during periods of market uncertainty. Furthermore, the effect of investor sentiment aligns with Tetlock (2007), who found that media tone and coverage can shape the intensity and speed of market responses. These results suggest that stock price adjustments are not purely based on new information but are also driven by behavioral factors.

Regarding control variables, firm size has a negative and statistically significant relationship with CAAR, indicating that larger firms experience smaller abnormal returns. This may reflect greater transparency, higher analyst coverage, and lower information asymmetry in large firms, as noted by Merton (1987). Liquidity, on the other hand, demonstrates a positive and significant relationship with CAAR, suggesting that more liquid stocks adjust more efficiently to new information.

Overall, the regression model explains 47% of the variation in CAAR, highlighting that information asymmetry, public announcements, behavioral biases, firm size, and liquidity collectively play a significant role in determining market reactions around announcement periods. These findings underscore the complex interplay between information dissemination, investor behavior, and market efficiency, demonstrating that stock price adjustments are influenced not only by new information but also by how investors interpret and act upon it.

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