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How Markets React to Earnings Announcements in the Absence of Analysts and Institutions Evidence from the Saudi Market

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"How Markets React to Earnings Announcements in the Absence of Analysts and Institutions: Evidence from the Saudi market"

Ahmed Alzahrani and Len Skerratt

Abstract:

How stock markets react to news is an established area of research. We examine the behaviour of the Saudi Stock market in response to earnings announcements where there are no analysts' forecasts, with the aim of examining the efficiency of the market. The SSM seems to underreact to positive news for the first five days and then reactions tend to strengthen in the following weeks, indicating the presence of a post–earnings announcement drift, or PEAD. At the same time, the SSM overreacts to negative news in the first five days and then reverses its direction and reports an upward post-earnings announcement drift. The individually dominated market combined with the absence of analysts' forecasts is the main explanation for this underreaction to positive news and overreaction to negative news.

JEL Codes:G14, G15, M40

Keywords: Post-Earnings Announcement Drift, Market Efficiency, Analysts' forecasts, Saudi Stock Market, Over and Under-reaction.

1 Introduction

This paper makes several contributions. First, we test the existence of post-earnings announcement drift (PEAD) in a comprehensive sample in a less developed market. Second, we provide a perspective on the way in which a market reacts to earnings announcements in the absence of analysts' forecasts. We test for PEAD effects not only in general, but also across industries on the stocks listed on the Saudi stock exchange. Third, the Saudi Stock Market (hereafter, SSM) is dominated by retail investors, which provides a perfect setting for studying investor behaviour and reaction to informational events. Fourth, the SSM has certain characteristics which distinguish it from many developed and emerging markets (e.g., high government ownership, larger market capitalisation and company size, highly active trading, lack of options and short selling and finally a market that is dominated by individuals). It is interesting to study the effect of these unique aspects of the SSM on stock trading and returns, especially in regard to earnings announcements.

Many stock markets in developing countries such as Saudi Arabia have no or a few financial analysts who – regularly – follow stocks and issue forecasts and recommendations. There is supporting evidence of high information asymmetry in developing stock markets which can be attributed to many other factors, including information intermediaries and corporate disclosure practice. Any attempt to measure market reaction to news in the SSM is essentially measuring retail investor's reaction because they dominate the market. We aim in this study to examine how the absence of analysts can impact the behaviour of the market. If the there is no price drift in the market, we can infer that PEAD is caused by analysts herding and bias. However, if the price drift is larger in magnitude, we can safely infer that analysts are important agents for the price impounding process to take places and for the market efficiency in general.

We study, indirectly, the impact of different market characteristics (the SSM being, for example, a market less followed by analysts, with inactive institutional investors and where short sales are not allowed) on market behaviour in regard to earnings news. We believe that the SSM is distinct from other developed markets in that it lacks active presence of analysts who are important information intermediaries in the market.

2 Literature Review

How investors perceive, interpret and react to news has been an active area of research since the seminal work of Ball and Brown (1968). They empirically investigated the association between accounting earnings as the core information in financial statement and stock returns in order to assess the usefulness of accounting information. They were the first to report a drift in the stock returns after earnings announcements, a phenomenon which was later given the name of the Post-Earnings Announcement Drift (PEAD). Since then, many researchers have confirmed the robustness of PEAD using different techniques and different data (e.g., Foster et al., 1984; Bernard and Thomas, 1998, 1990; Ball and Bartov, 1996; and Chordia and Shivakumar, 2005).

Capital markets research findings suggest that earnings announcements contain information which is believed to alter investors' opinion about the value of stocks through the process of impounding information on prices.

PEAD is the continuous upward (downward) drift in prices after positive (negative) news. The price drift is the result of a persistent underreaction to earnings news. It suggests that the market underreacts to information on earnings announcements and hence that future returns are somewhat predictable. PEAD is considered one of the most robust stock market anomalies to be considered in the financial literature. The Efficient Market Hypothesis (EMH) states that prices should fully and instantaneously reflect all publicly available information.[1] Hence, an efficient market should incorporate all information (factual or predicted) into prices in a quick and unbiased way. A price drift in general indicates that the market fails to translate the information into prices. For this reason, many researchers consider the price drift to be a serious empirical challenge to EMH.

While most of the PEAD studies concentrated first on US markets and data, more recent studies have expanded the coverage to other European and emerging markets worldwide. However, the mainstream evidence comes from US data and other stock markets have attracted little research .Naturally, the UK market has become the second most studied market in terms of price drift but beyond this only a few other European or Asian markets have been the subject of studies, a mere handful, and other markets in the Middle East and North Africa have hardly been studied at all.

Why stock prices drift after the earnings announcement

While the PEAD is well documented in the literature, the reasons for the persistent underreaction to earnings announcements are not well understood. This phenomenon can be explained with a number of hypotheses, but two competing hypotheses and explanations dominate the debate. The first is the rational explanation and the second comes from the behavioural school which suggests that investors are irrational. Advocates for the rational and efficient market claim that PEAD can be explained by the inaccuracy of the tools used by researchers to detect the price drift, an inaccuracy which may stem from returns mismeasurement, risk mismeasurement or methodological biases in general. They also attribute importance to such causes for the drift as the rational risk premium and transaction cost. This rational explanation views the price drift anomaly as a compensation for risk associated with shocks in the earning news (See, for example, Foster et al, 1984; Dyckman and Morse, 1986; Garfinkel and Sokobin, 2006).

The difficulty in explaining the PEAD by an argument consistent with market efficiency has motivated the behavioural explanations. Behavioural finance generally argues that irrationality in the form of one or more cognitive biases has led to observed patterns of abnormal returns. Because of shared human attributes, such as overconfidence, greed or fear, people make errors of judgment, which are a deviation from the assumption of rational expectations in economics and the Efficient Market Hypothesis. Findings suggest that PEAD is related to investors'

underraction or overreaction to earning news (see, for example, DeBondt and Thaler, 1985; Bernard and Thomas, 1998; and Daniel et al., 1998). A common explanation for this phenomenon is that investors underreact to earnings news and they also fail to recognise the serial autocorrelation patterns in quarterly earnings (Bernard and Thomas, 1990; Ball and Bartov, 1996).

Another line of research, more relevant to our paper, is aimed to distinguish between individual trading and institutional trading. Several studies suggest that institutional trading is more sophisticated than individual trading and accordingly, individual trading may be more responsible for the PEAD than institutional trading is (see, for instance, De Franco et al, 2007). Hirshleifer et al. (2008) call it the individual trading hypothesis. Bhattacharya (2001) and Battalio and Mendenhall (2005) provide evidence consistent with the conjecture that individuals cause the PEAD.

The magnitude of the drift may differ for good and bad news. Management plays an important part in explaining overreaction and underreaction to news. When there is good news, it is announced immediately. It benefits the management to announce all positive news. However, when there is negative news, management tends to announce it at some point in time but maybe to delay it (see, for example, Hong et al., 2000)

Market Expectation proxy (the Earning Surprise)

Kothari (2001) emphasises that the degree of return-earnings association is crucially affected by the accuracy of the proxy set by the researcher for the unexpected earnings. It is common for most market reaction studies to measure standard unexpected earnings (SUE), which are defined as actual earnings minus expected earnings standardised by earning variance. Unexpected earning is considered the explanatory variable in the regression analysis which enables us to understand why the market reacts in such a way.

Many measures have served as proxies for unexpected earnings or the surprise component of earnings, the two most popular of which are the time-series property of earnings and analysts' forecasts. Time-series forecasts of earnings (yearly or quarterly) emerged first as a proxy which researchers often used to model expected earnings (see, for instance, Foster, 1977; and Brown, 1993). These studies typically use a time-series models to predict earnings, forming two portfolios, one composed of companies with higher earnings than predicted and the other of companies with lower earnings than predicted by the time-series model. Analysts' forecasts are nowadays the most frequently followed proxy for unexpected earnings; many researchers agree that it is a better substitute proxy for market expectations than forecasts generated by time-series models. For a discussion on the topic, see Kothari (2001). Consensus forecasts are often used where the average of analysts' forecasts is considered to be the market expectation of earnings. However, despite the growing dependence on analysts' forecasts, there are major issues related to the accuracy of these forecasts, such as underreaction and incentive bias. Often these forecasts are optimistic and made by sell-side analysts who are, typically, working in an investment bank which has a business relationships with the firm whose security is being

analysed. It has indeed been established that analysts' earnings forecasts are biased and optimistic (see, for instance, O'Brien, 1988; Brown, 1993).

A relatively new measure has been used, namely, Earning Announcement Returns (hereafter, EAR). The scarcity of analysts in the SSM creates the need for EAR to be used as a proxy for market expectations for earnings.[2] The actual market reaction to the information contained in the announcement could be the best estimator of the surprise. Assuming investors' rationality and in line with the market's "Efficiency", the market on the aggregate level should react to the earning announcements in the same direction. For example, if a firm announces a large increase in earnings growth, the stock price should move upward to reflect this change in the firm's fundamental value. When the market does fail to fully react to the information disseminated in the earnings announcement, we expect the anomaly of "PEAD" to occur. The EAR can be extended to a multi-period event window. The logic for constructing more than a one-day earnings announcement window is that announcements are sometimes made public toward the end of the day or there could be a leakage in the market before the announcement is due.

Brandt et al. (2008) have used this measure and find the drift for EAR strategy is stronger than post earnings announcement drift for SUE. Chan et al. (1996) believe that cumulative abnormal announcement returns to be a clean measure of earning surprise because it is free of the bias which is typically associated with earning expectation models. Chan et al. (1996) find this proxy is as good a predictor as the time series forecasts for subsequent returns. This proxy for earning surprise has also been used by many others (see, for example, Garfinkel and Sokbin, 2006; Lerman et al., 2008).

The Saudi Stock Market: characteristics and structure

The SSM is a pure order-driven market where only common stocks are traded with financial derivatives and short selling not allowed in the market. In 2008, individual trading amounted to 92% of all trading volume, implying that institutional trading is negligible in the SSM. Nonetheless, it is an extremely active stock exchange with respect to of trading volume and market capitalization compared to other regional equity markets.[3] As we can witness from Table 1 the SSM has experienced tremendous growth in market value, number of listed firms and trading volume over the time period 2002-2008. For instance, the number of shares traded and number of transactions have grown remarkably in the last seven years averaging 165% and 175% respectively.

Table1: Saudi Stock Market Main Indicators.

Year	No. of Investors	No of Firms	N0. Of Shares traded In Millions	No. of Transactions '000	Market Value in Billions (Saudi Riyal)	Index(Value-weighted)
2002	N/A	68	1,735	1,033	280	2,518
2003	N/A	70	5,565	3,763	589	4,437
2004	1,383,636	73	10,298	13,319	1,148	8,206
2005	2,573,597	77	12,281	46,607	2,438	16.712
2006	3,577,618	86	54,440	96,095	1,225	7,933
2007	3,669,538	111	57,829	65,665	1,946	11,176
2008	3,954,316	126	58,727	52,135	924	4,803

Notes: Year of Trade, Number of investors present in the Saudi Stock Market, Number of Shares Traded in Millions, Number of Transactions in thousands, Market Value in Billions, and a Value Weighted Index for the Saudi Stock Market. Forty fourth Annual Report. The exchange rate is approximately ($1=3.75 Saudi Riyal). Source: SAMA.

Although the SSM is the largest stock market in the Middle East, representing 41 per cent of the total capitalization of Arab stock exchanges, the number of listed stocks and the size of the free-float of shares is small. Therefore, it is considered a thin market in comparison with more developed and mature markets. In a recent country assessment report by the IMF (2006), the Saudi equity market is regarded as buoyant, with significant turnover but with limited provision of investment information. [4]

In general, disclosure norms and announcement practices in the SSM are poor, in particular regarding items of voluntary disclosure, such as earning forecasts and management activities. However, publishing practice has relatively improved with automation and Internet access being available to all investors. The time and accuracy of earning announcements has greatly improved in the last 8 years, especially after CMA establishment.

Most of the research on the SSM has primarily extracted data of the time span preceding the introduction of the CMA in 2004, which was a milestone in the SSM's development. Data analysed after the creation of CMA will be of significance not only to the CMA's existence itself but to the rules, developments and changes which have faced the SSM since then.

3 Data and Descriptive Analysis

The dataset includes all companies in the SSM that have operating profits, 89 firms, for the period 2001-2007. 1667 earnings announcements were documented from the Tadawul website after removing those announcements for which the exact timing and date of dissemination to the

market could not be verified. Data regarding stock daily prices were provided by the official stock exchange.

Earning announcements are disseminates through the official website, www.tadawul.com.sa and later in other media. Firms are required to publish their announcements in periods set by the CMA (a two-week period from the end of each company's quarter end for the quarterly statements and a 40-day period from the end of the year for the yearly statements).

There is no standard format to which companies should adhere in their announcements; each company has its own style of wording and has control over the content. In general, the announcements contain the current quarter's sales, operating profits and any extraordinary or non-recurring items which might affect its earnings. The current quarter's earnings are usually compared (in percentages) with the previous quarter or the equivalent quarter in the previous year (the most common). Some companies include general future expectations of the company's earnings. It should be noted that companies tend to give better and more detailed treatment of positive news than negative news, e.g., the percentage of an increase in earnings is usually mentioned whereas the percentage of a decrease is omitted sometimes.

Moreover, some companies announce accumulated earnings up to date, i.e., they announce earnings as an accumulated figure without specifying what percentages or proportion should be attributed to each quarter (i.e., a figure for the earnings in all quarters of the financial year without breaking them down into quarterly numbers). Readers must refer to previous quarters to know the exact figures for them all; such a method could be misleading and confusing, whereas the quarter net contribution figure could easily be shown. A company may have done better in the aggregate number, but worse in the last quarter or vice versa. . In the following anlysis, we exmine any systematic bias which could be associated with the announcements practice in the SSM, such as the clustering or overlapping of events and timing patterns of the announcments

Announcments by week number

Announcements were fairly evenly distributed in all weeks throughout the year. Weeks 4,16,30,43 and 44 have the highest frequency, as they occur at the same distance from the end of each quarter in turn. A careful look at the dates of events in Figure (1) shows, however, that many announcements are made outside these specified weeks. Announcements are made almost evenly throughout the announcments period allowed by the CMA.

[Insert Figure 1 here]

As mentioned earler, there are no scheduled announcements for companies in the SSM. However, an announcment period of 2 weeks starting from the last day of each firm's quarter is the period in which each company should report its earnings, or face a penatly levied by the CMA. The fact that companies have longer announcement periods helps us to better interpret normal returns results, since not all announcement are clustered around any particular date.

Day of the week analysis

The announcements data were further investigated for any pattern which could be of interest, such as the day of the week effect. One of the implications of the day of the week effect is that news announced on a Friday, which is the last trading day of the week in any developed market, or Wednesday in the case of the SSM, might not attract investors' attention at the time and might therefore produce a delayed reaction.

Events were categorised by the day of the week when they occurred, including events announced at the weekend. The SSM used to operate from Saturday through Thursday, with Friday as the weekend. With effect from 15/06/2006, the weekend was extended to two days (Thursday and Friday), after the cancellation of trading on Thursdays. In September 2006, also, the trading hours were reduced from two sessions (morning and evening) to one. Before this date, it was customary for firms to make their announcement between sessions. As seen in Figure (2), announcements occur fairly evenly throughout the week. Only 4% of annoucnments were made at weekends, which indicate the lack of evidence of when managements time their annouuncements.

[Insert Figure 2 here]

Methodology (Event study)

In event study methodology, the interest is to measure the performance of a security following an "event".[5] An important step in this process is to define what a "normal" or expected performance is or should be, then it will be a matter of computation to realise what can be considered as "abnormal" performance. The Abnormal return represents the difference between the "expected" return and the actual return. Several methods are used in prior research to estimate expected or normal return; Mean Adjusted Model, Market Adjusted Model, Market Model, the Capital Assets Pricing Model (CAPM) and more recently Fama-French Three Factor Model. The essence of all these models is to subtract the actual performance from the expected performance. In other words, abnormal returns are the differences between event returns and non event returns (expected returns unconditional on the event).

What differ among these models are the assumptions about the expected return $E(R_{it})$ and the risk for the security with regards to the market portfolio reflected in the coefficients. In practice, the gains from using more sophisticated models are limited because the variance of abnormal return is not reduced significantly by choosing these models (Brown and Warner, 1985; and MacKinlay,1997).

We use market adjusted model to estimated abnormal returns, where it assumes the expected returns are equal across all stocks at a point of time t, but not necessarily constant for a stock at different times. The abnormal return for a stock is defined to be the residual which is calculated as the difference between the return on the stock $\boldsymbol{R_{it}}$ and the return on the market portfolio$\boldsymbol{R_{mt}}$ written as:

$$\boldsymbol{AR_{it} = R_{it} - R_{mt}} \qquad (1)$$

This model has been used in many event studies for its simplicity and easiness of calculation. Because the coefficients are pre-specified, there is no need for an estimation period prior to the event period in order to find parameter estimates. We choose the Market-Adjusted Model because it is the most appropriate model that could accommodate the nature of our data. For each company, calendar time of the announcement is converted to event time by defining the date of announcement (t=0). For announcements on Thursday and Friday (when the markets are closed) and on stock exchange holidays, we use the next available trading day as the event day, t=0. Next, we calculate the daily stock returns for each stock and for the market index as follows:

$$\boldsymbol{R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}, and \;\; R_{mt} = \frac{T_t - T_{t-1}}{T_{t-1}},} \qquad (2)$$

Where $\boldsymbol{P_{it}}$ is the stock price of the *i*th firm at time *t*, $\boldsymbol{R_{it}}$ refers to its rate of return, $\boldsymbol{T_t}$ represents TASI(index) value at time *t* , and $\boldsymbol{R_{mt}}$ is its rate of return.

The abnormal returns are aggregated through two dimensions: cross-sectional aggregation and time aggregation. Abnormal returns are calculated over a 40-day period or an event window (-19, +20). In the cross-sectional aggregation, AR_i are averaged across the N firms in the sample on each day *t* to form the average abnormal returns AAR, as can be shown in the following equation:

$$\boldsymbol{AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it}} \qquad (3)$$

AAR_t = The average abnormal return across event observations N (number of companies)

One drawback of examining AARs in an event study is that they do not accurately reflect the return realized by actual investors. There are two common ways of calculating the impact of the event on the returns of security and an investor's wealth: cumulative abnormal returns (CARs) and buy-and-hold abnormal return (BHARs). BHAR is calculated by compounding each period's abnormal return (subtracting the stock returns from the benchmark or market returns). Abnormal returns are calculated into a buy-and-hold measure to accurately reflect the change of investor wealth:

$$\mathbf{BHAR_{i,t} = \prod_{t=0}^{T} [1 + AR_{i,t}]} \qquad (4)$$

Barber and Lyone (1997) favour the use of BHAR, showing that CARs suffer the bias of not reflecting the experience of investors. However, BHAR suffer from a rebalancing bias in long-run studies, when using equally-weighted reference portfolios with periodic rebalancing.

To estimate a performance measure for any time interval or event window for the total sample, CAAR, the Cumulative Average Abnormal Return is computed. It is a measure of abnormal performance which adds up each day's average abnormal return AAR_t. In other words, CAAR corresponds to the way in which an investor (sample) portfolio would perform around the event window in terms of wealth change. Tests using CAAR can also be used to infer the market efficiency as systematic non-zero cumulative abnormal returns following an event. Furthermore, one could hypothetically benefit by trading on this anomaly (ignoring trading costs). **CAAR** is defined as:

$$\boldsymbol{CAAR(t_1, t_2) = \sum_{t=t_1,}^{t_2} AAR_t} \quad (5)$$

Where $\boldsymbol{CAAR(t_1, t_2)}$ represents the cumulative market -adjusted abnormal return on a portfolio of N events over the time period t_1 to t_2. For example, $CAAR(-1,+1)$ is the cumulative average abnormal return across event observations from day $t_1 = -1$ to day$t_2 = +1$.

Testing Abnormal Returns for Significance (test-statistics)

Based on the efficient market hypothesis, all tests of statistical significance are tests of the null hypothesis that abnormal returns are zero over any event window. However, rejecting this null hypothesis indicates the possibility of achieving predictable abnormal returns and outperforming the market. To test whether there is any significant change in firms' value around the announcement day, we use aggregated returns, over firms and cumulative over time, since individual stock returns typically have higher variance, which could affect the power of the test.

Masulis (1980), Brown and Warner (1985), Corrado and Zivney (1992), Beneish and Gardner (1995) and many others have used the following test statistics, assuming abnormal returns are independent across securities. In this test statistic, the mean excess return is divided by its estimated standard deviation, which is estimated from the time-series of mean excess returns. The test statistic for any event day "t" is as follows:

$$\boldsymbol{\text{test} - \text{statistics} = \frac{AAR_t}{{s_{AAR_t}}^2}} \quad (6)$$

Where $\boldsymbol{AAR_t}$ is the average abnormal return at time t for N events and $\boldsymbol{s_{AAR_t}}$ is the estimated standard deviation the time-series of mean excess returns for a pre- or post-event estimation window. The variance of this series (an equally-weighted portfolio variance),$\boldsymbol{s_{AAR_t}}$ is estimated over 21 trading days (-40, -20). The variance estimate is:

$$\boldsymbol{s_{AAR_t} = \sqrt{\frac{1}{N-1}(AAR_t - \overline{AAR_t})^2}} \quad (7)$$

Where $\boldsymbol{AAR_t}$ is the average abnormal return at time t for N events and $\boldsymbol{\overline{AAR_t}}$ is the sample mean average abnormal return for an interval of K days fromt_1 to t_2 . The expected

values of $\boldsymbol{AAR_t}$ and $\mathbf{CAAR(t_1, t_2)}$ are zero in the absence of an abnormal return. For the cross sectional averaged abnormal returns, we can form our hypothesis as follows:

H_o **: Expected average abnormal return is zero or** $\boldsymbol{AAR_t = 0}$ **.**

H_1 **: Expected average abnormal return is different from zero or** $\boldsymbol{AAR_t \neq 0}$.

CAAR can also be tested by standard test statistics where the CAAR is divided by an estimate standard deviation of the time series of average abnormal returns aggregated over event window *K*. As K periods increase for the CAAR estimation window, the variance also increases.

$$\mathbf{t-statistics} = \frac{\boldsymbol{CAAR(t_1, t_2)}}{\sqrt{(\boldsymbol{K+1})\boldsymbol{s_{AAR_t}}^2}} \qquad (8)$$

We need only to adjust the variance for the accumulation of time where K is the total number of event time (days) observations used to calculate CAAR. The focus of this model is to test whether or not the average return on the sample during the event window is statistically different from the average return during a non-event period. It is crucial to make sure that events are not clustered or overlapping; if they are, they will hinder any inference from the test statistics.

We hypothesise that CAAR = 0. In other words, investors' wealth will not experience abnormal returns merely because of investment decision made conditionally on the event:

H_o **: If the expected cumulative average abnormal return is zero, CAAR=0.**

H_1 **: If the expected cumulative average abnormal return is other than zero, CAAR≠0.**

4 Results

Before we investigate the abnormal returns CAAR or BHAR in different even windows, we plot the behaviour of the abnormal returns on figures to show visually how the SSM reacts to earnings announcements in the period (-20,+20).

[Insert Figure 3 here]
[Insert Figure 4 here]
[Insert Figure 5 here]

Table 2: Average Abnormal Returns (AARs) with their t-tests and Average Performance Indices (APIs).

	A: Positive Return Portfolio			B: Negative Return Portfolio		
Days Relative to Announcements	AAR (%)	t-test	API	AAR (%)	t-test	API
-19	0.09%	-0.642	1.001	-0.07%	0.620	0.999
-10	-0.08%	-1.255	0.999	0.33%	3.311***	1.000
-5	0.07%	1.116	1.001	0.11%	1.320	1.001
-4	-0.07%	-0.124	1.000	-0.26%	-2.609***	0.998
-3	-0.04%	-1.855*	1.000	-0.34%	-2.093**	0.995
-2	-0.01%	-0.882	1.000	-0.24%	-1.522	0.993
-1	-0.18%	-2.043**	0.998	-0.05%	-0.247	0.992
0	1.83%	14.145***	1.016	-2.12%	-18.273***	0.971
1	-0.30%	-7.494***	1.013	-0.49%	-15.105***	0.966
2	-0.01%	-1.014	1.013	-0.33%	-3.870***	0.963
3	-0.18%	-0.005	1.011	-0.18%	-3.292***	0.961
4	-0.07%	-0.579	1.010	-0.22%	-2.285**	0.959
5	0.5%	0.947	1.011	-0.02%	-0.490	0.959
10	0.01%	0.350	1.014	0.27%	0.461	0.974
20	0.12%	2.047**	1.036	0.18%	3.878***	0.984

Notes: The table reports the average stock price response to earnings announcements around the event day (0, +1). The T-test was conducted in the traditional way $t = \frac{AAR_t}{(\text{var}(AAR_t))^{1/2}}$. The table provides a standard test for whether the average abnormal return AARt is significantly different from zero. The positive return portfolios are reported in Panel A (708 firms) and negative return portfolios (959 firms) are reported in Panel B. Portfolios were formed on the basis of the earnings announcement returns during an extended period of two days (0, +1). We extend the announcement period to two days to capture any market reaction for announcements made after or toward the end of the trading day. The average performance index (API) uses a buy-and-hold strategy to calculate returns as follows: $API = \prod_{t=0}^{T}[1 + AR_{it}]$.* Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level

Our finding rejects the null hypothesis that there is no daily abnormal return for the -3, -1, 0 and 1 days for Panel A. The higher significance levels are found at Day 0 and Day 1 at 1%. This is expected, as these are considered the initial market reaction to the positive news. AARs for the four days following the event day are of the wrong or opposite sign. This may point to some underreactions to the event which is later being corrected by the fact that the AARs from day +5 until day +20 start to pick up again with positive returns.

For the negative news portfolio, AARs are significant for the following days: -10,-4,-3, 0,1,2,3 and 4. Most of these AARs are significant at the 1% level with negative t-tests. This

suggests that the market overreacts to bad news, starting even before the announcement day. Negative AARs form in the period (-5, +5); after this, the market reverses its direction and corrects its movement to a level where it would regain almost all its losses. The average performance index API, which reflects the actual investors' wealth change, shows us clearly that an investor who invested initially in the specified portfolio on day t-20 could lose, on average, up to 5% if he was to liquidate his bad news investment 5 days after the announcement day. However the same investor would regain his losses and reach near break-even point 20 days after the announcement. In general, It appears that prices underreact (overreact) to positive (negative) news for the first week after the announcement, then prices reverse for both portfolios achieving higher positive returns which drift upward for the next two and a half weeks; that is, window(+5,+20).

Table 3: Positive and Negative news portfolios' performances using CAAR.

Event Window (week number)	**CAAR (in days)**	**Good news**	**Bad news**
A:Pre-Announcement period			
Weeks (-4,-1)	CAAR (-20,-2)	-0.65%**	0.39%
Weeks (-2,-1)	CAAR(-11,-2)	-0.21%	0.40%*
Week (-1,-1)	CAAR(-5,-1)	-0.66%***	-0.51%**
Day (-1,-1)	CAAR(-1,-1)	-0.23%	-0.03%
B: Announcement day(s)	CAAR (-1,+1)	2.30%***	-2.96%***
C: Post-announcement period			
Week (+1,+1)	CAAR (+2+5)	0.14%	-0.96%***
Week (+1,+2)	CAAR (+2+11)	0.41%**	-0.40%**
Week (+1,+4)	CAAR (+2,+20)	2.11%***	1.24%***
D: Whole period (40 days)	CAAR (-19,+20)	3.77%***	-1.33%***
No. of Firms		708	959

The table reports the positive and negative news performances over different time intervals to show how events are anticipated in the pre-event period and to examine the market reaction to news over different event windows. Event periods were divided into four panels. Panel A reports the pre-announcement cumulative returns, Panel B shows the announcement day(s) returns, Panel C the post-announcement period and Panel D the whole period (40 days). Good news firms increase on average by 3.77% over CAAR (-19, +20), while Bad news firms decrease on average by -1.33% over CAAR (-19, +20). The statistical significance of the average stock price response to the earnings announcements around different event windows is computed as follows: $\mathrm{T}-\text{statistics}=\frac{\mathrm{CAAR}\left(\mathrm{t}_1,\mathrm{t}_2\right)}{\sqrt{(\mathrm{K}+1)\mathrm{s}_{\mathrm{AAR}\,\mathrm{t}}{}^2}}$.

For robustness, we compute CAAR using different surprise measure (Time-series) which shows similar reaction to news. * Estimate significant at the 10% level,** Estimate significant at the 5% level,*** Estimate significant at the 1% level

For the cumulative average abnormal return CAARs, we construct different CAAR windows to capture any unusual activities around earnings announcements. Event windows were divided into four periods; pre-announcement, announcement day, post-announcement and the whole period; their results are presented in Panels A, B, C and D, respectively. Panel A shows an event window which starts 20 days before the announcement and continues until the announcement day. The pre-announcement period shows any anticipation or leakage of news. We can observe statically significant cumulative abnormal returns in the period (-5, -1) for portfolios of both Good and Bad news, indicating the importance of examining this period carefully and testing whether this period could explain returns in subsequent periods. For the good news portfolio, CAAR (-5,-1) interestingly shows a negative return (-0.66%) which is significant at the 1% level. For the Bad news portfolio, the pre-announcement CAAR (-11,-2) and CAAR (-5,-1) show statistical significance at both the 5% and 1% levels, which could indicate a leakage of information to the market because it shows the reaction starting from Day t = -10 with a negative sign of CAAR. A loss-averse investor is more highly motivated to anticipate bad news to avoid losses incurred by these announcements.

In panel B, which captures market reaction around the announcement day, the CAAR for the three days (-1 to +1) shows the good news reports price impact with a 2.3% increase which is significant at the 1% level. Conversely, the CAAR (-1, +1) for the Bad news portfolio reports the highest price impact, with an almost 3% decline which is significant at the 1% level. The strongest part of the price reaction takes place in the event window (-1, +1), which suggest that the SSM is somehow efficient to an extent in impounding the new information into the prices.

The post-announcement period in Panel C exhibits interesting patterns of return, while the Good news portfolio clearly indicates predictability in its returns, which are characterised by initial underraction. The Bad news portfolio does not reverse its return sign until a week after the announcement is made.

In the Good news portfolio, CAAR (+2, +5) shows no statistical significance, which confirms our previous analysis of the AARs that the market underreacts to Good news for the first five days after the announcement is made and then the market starts to form a post-earnings announcement drift for certain days (+2, +11). This is also confirmed by the CAAR (+2, +20) which is significant at the 1% level. Around 74% of the cumulative returns in the post-announcement period originated in weeks 3 and 4, while weeks 1 and 2 contribute only 26% of the CAAR in this period. One explanation of this underreaction at first followed by a price drift pattern is that most investors in the SSM are individuals who lack the ability to interpret earnings announcements properly. Moreover, there are no analysts following the market who could issue recommendations and forecasts; thus it takes investors more time to react to positive news later on, when interpretation and analysis can be found in newspapers, TV interviews and Internet forums. In the behavioural finance literature, this kind of behaviour is called “Investors’ Attention”. The Bad news portfolio shows continuous reaction in the first week after the announcement day and then a price reversal which almost compensates for all the losses incurred because of the announcement. Positive CAAR in the period (+2,+20), as compared to negative CAARs in (+2+5) and (+2+11) indicate a strong price correction of the initial negative returns in the first week after the earnings announcement. CAARs for the post- announcement periods (+2+11) and (+2,+20) report statistical significance at both the 5% and 1% levels, with negative returns for first period, preceding positive returns for the second period. This confirms

our previous analysis of overreaction in the first week followed by price reversal in the weeks 2, 3 and 4 after the announcements being released.

Overall, CAAR (-19, +20) reports 3.77% abnormal returns for the positive news firms and (-1.33%) abnormal returns for the negative news firms that are all significant at the 1% level. The price impact of earning news is persistent in the good news firms while much of the price reaction in the bad news is reversed shortly after the earnings being released.

Does PEAD differ by industry?

This industry-level analysis is addressed because we believe that there are certain characteristics associated with certain industries. For example, the banking and industrial sectors tend to have larger than average size companies, higher government ownership and higher institutional ownership. In contrast, the service and agriculture sectors can be described as having low market capitalisation, higher volatility in stock prices and earnings, a lower level of disclosure and many loss firms. We believe that reporting average and cumulative abnormal returns around earnings announcements by industry may reveal some explanation for the PEAD based on company characteristics.

We expect companies of small size with fewer institutional investors to have a stronger price reaction, either in the form of a delayed price reaction or an initial overreaction followed by a price reversal. It is very well established in the literature that small companies which are less often followed by analysts tend to show a higher PEAD pattern in their returns around earnings announcements; hence, we expect the drift to vary by size as well. Our selection of industries can also serve as a proxy of size because large firms tend to be in the banking and industrial sectors.

Table (4) lists all industries' CAARs in Panel A, while Panel B shows how returns around the earnings announcement impact investors' wealth formation, using the BHAR method. In Panel A, the average CARs for different industries vary and the upward price drift seems to be more persistent for industrial, agricultural and insurance forms in the Good news portfolios. In the Bad news portfolios, the banking, industrial, cement and electricity sectors show a persistent downward price drift which is consistent with the literature, whereas the service, agriculture, telecommunication and insurance sectors show contradicting results of negative initial reaction to bad news followed by positive reaction in the weeks following earnings announcements.

Panel B reports returns on both Good and Bad news portfolios of 1 S.R. invested equally in all industries using buy-and-hold-abnormal returns method for the period between –20 and +20. Agriculture and insurance sectors report the highest returns on their Good news portfolios at 9% and 8%. Electricity and banking report the highest losses for the same period of investment (-20 to +20). Interestingly, the insurance and agriculture sectors report positive returns for the bad news portfolios at 4.2% and 2%, respectively. It should be mentioned that, due to their relatively small size, these sectors are always the target of very speculative waves which make their prices deviate very widely from their fundamental values.

The service and agriculture sectors have the highest (EAR) on days (0,+1), confirming our expectation that small companies will show a strong price reaction due to the higher volatility and risk associated with this type of company. Moreover, blue chip sectors (i.e., banking, industry, cement) show lower CAAR in the days proceeding the announcement day, indicating that the level of information leakage or price anticipation in general is lower in these sectors than in sectors where the companies are small and less often followed by investors and the media.

Table 4: Cumulative Average Abnormal Returns (CAAR) by Sector.

	High ← Government and Institutional ownership →															
Event window	***Electricity* (n=31)**		**Banking (n=235)**		**Industrial (n=622)**		**Cement (n=216)**		**Telecom (n=38)**		**Service (n=397)**		***Agriculture* (n=164)**		***Insurance* (n=21)**	
Panel A: CAAR	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**	**G**	**B**
(-20,-1)	**-0.036 *****	**0.015 *****	**0.000**	**0.001**	**-0.004**	**0.008 ****	**-0.018 *****	**-0.010 *****	**0.008**	**0.013 *****	**0.019 *****	**0.024 *****	**0.005**	**0.042 *****	**-0.011**	**0.052 *****
(-10,-1)	**-0.029 *****	**-0.002**	**0.002 *****	**-0.001**	**-0.004**	**0.010 *****	**-0.006 *****	**-0.004 *****	**-0.020 *****	**0.015 *****	**0.014 *****	**0.006 ****	**-0.015 *****	**0.032 *****	**-0.019 *****	**0.057 *****
(-5,-1)	**-0.037 *****	**0.004 ***	**-0.002 ***	**0.001**	**-0.007 *****	**-0.003**	**-0.003 ****	**-0.003 ***	**0.009 ****	**0.025 *****	**0.007 ****	**-0.007 *****	**-0.025 *****	**-0.003**	**-0.011 ****	**0.064 *****
(0,+1)	**0.026 *****	**-0.021 *****	**0.001 *****	**-0.020 *****	**0.032 *****	**-0.036 *****	**0.018 *****	**-0.016 *****	**0.025 *****	**-0.022 *****	**0.046 *****	**-0.036 *****	**0.047 *****	**-0.047 *****	**0.024 *****	**-0.025 *****
(+2+5)	**-0.005**	**-0.016 *****	**0.001**	**-0.003 ****	**0.002**	**-0.011 *****	**-0.003 ***	**-0.006 *****	**-0.008 ****	**0.010 *****	**-0.021 *****	**0.005 ***	**0.002**	**-0.022 *****	**0.013 *****	**-0.007 ***
(+2+10)	**-0.008 ***	**-0.022 *****	**-0.002 *****	**0.000**	**0.008 *****	**-0.008 *****	**-0.009**	**-0.005 *****	**-0.035 *****	**0.000**	**-0.027 *****	**-0.001**	**0.003**	**0.000**	**0.057 *****	**-0.003**
(+2,+20)	**0.061 *****	**-0.054 *****	**-0.005 *****	**-0.006 *****	**0.030 *****	**0.012 *****	**0.002 ****	**-0.003 ***	**-0.030 *****	**-0.001**	**-0.026 *****	**-0.003**	**0.036 *****	**0.033 *****	**0.071 *****	**0.017 ****
Panel B: *BHAR (-20,+20)*	**1.05**	**0.941**	**1.037**	**0.976**	**1.059**	**0.984**	**1.001**	**0.971**	**1.002**	**0.989**	**1.038**	**0.986**	**1.09**	**1.02**	**1.086**	**1.042**

This table shows cumulative average abnormal returns (CAAR) and buy-and-hold-abnormal returns (BHAR) broken down by sectors. Sectors were organised in descending order according to government and institutional ownership. Positive (negative) returns are reported for each industry in two portfolios Good and Bad. The letter G represents the Good news portfolios while B represents the Bad news portfolios. The table reports the positive and negative news performances over different time intervals to show how events are anticipated in the pre-event period and to examine the market reaction to news for different industries. *Significant at the 10% level,** Significant at the 5% level and *** Significant level.

5 Conclusion

In this paper, we document the existence of PEAD in the SSM, using announcement returns as proxy for the earnings surprise. Disregarding transaction costs, it is possible in the SSM to outperform the market constantly by adapting the market reaction patterns and through the use of PEAD. We also detect higher anticipation of news in the pre-announcement period, indicating informed trading and leakage of information. The results pose a challenge to the efficiency of the SSM. The SSM seems to underreact to positive news for the first five days and then a positive reaction tends to be stronger for the following weeks, indicating the existence of a post-earnings announcement drift. In contrast, the SSM overreacts to negative news in the first five days and then reverses its direction and reports an upward post-earnings announcement drift. Our results suggest that the market is slow in adjusting to new information when there is good news and overreacts to bad news. Our findings confirm the uncertain information hypothesis suggested by Brown et al. (1988, 1993), who postulate that rational, risk-averse investors may underreact to positive news and overreact to negative news.

The results are robust using different earnings surprises EAR and time-series earning expectation models. The absence of analysts' forecasts and an individually dominated market are the main explanation of this underreaction to positive news and overreaction to negative news. It is confirmed by higher PEAD in sectors containing smaller firms and where there is lower government and institutional ownership.

Our earnings announcement investigation doesn't reveal any systematic bias in the distribution of announcement dates (i.e., announcing bad news on last trading day of the week). Moreover, the SSM reacts strongly to year-end positive earnings announcements, whereas the market discounts bad news gradually on the quarterly base. A possible explanation for the stronger reaction to year-end positive news is that they usually signal future performance. For example, it is customary in the SSM to announce dividends, stock grants and other "good" news in the weeks following year-end positive announcements.

Transaction costs have been highlighted by many researchers as a limitation of the arbitrage strategy of riding the PEAD wave .However, like Ng et al. (2008), we find weaker returns response at the time of the announcement and a higher subsequent return drift for firms with higher transacting costs, especially good news and small firms.

In conclusion, the SSM shows predictable returns around earnings announcements. It is possible in the SSM to outperform the market constantly by adapting the market reaction patterns using PEAD investment strategy. Disregarding transaction cost, for a holding period of (-19, +20) an investor would achieve 3.77% abnormal market-adjusted returns for positive news firms (15% annually) and -1.33% abnormal market-adjusted returns for the negative news firms (-5.32%) annually.

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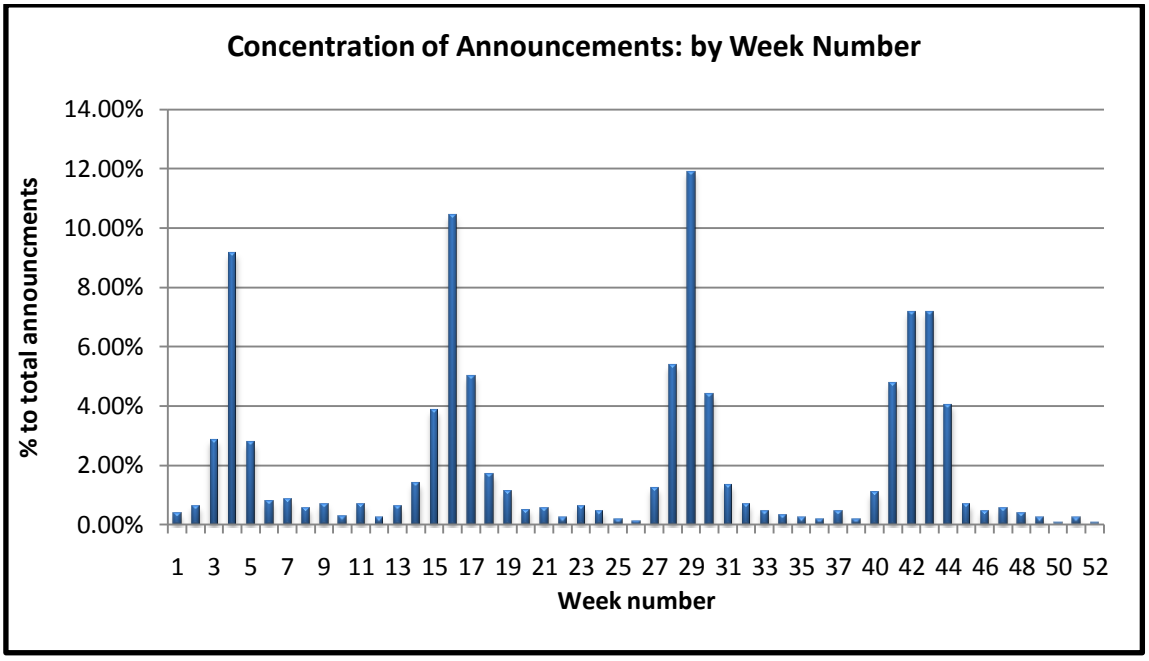
Figure 1: Weekly Distribution of Announcements



This Figure plots clustering of announcements per week. Some week numbers, typically, have a higher percentage of announcements because these weeks fall in the announcement period (after the end of the quarter). The total number of observations is 1667 earnings announcements.

Figure 2: Daily distribution of announcements

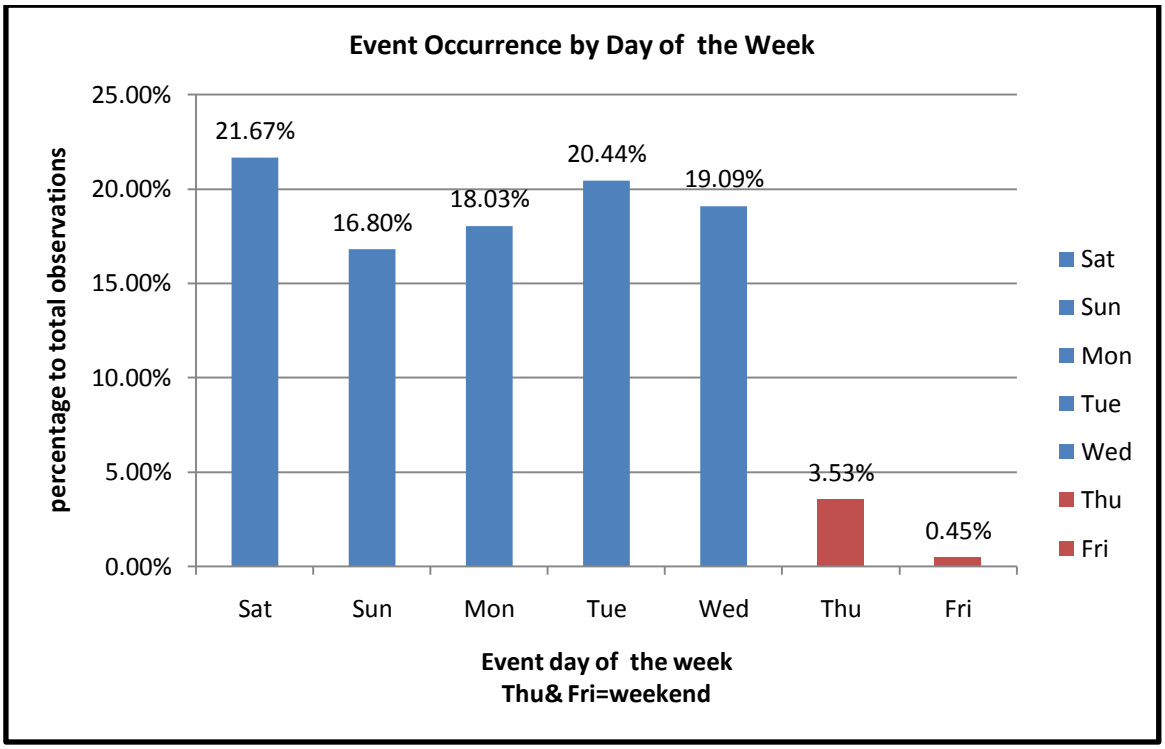


Figure 2 displays event occurrence by the day of the week. The number of observations of quarterly earnings announcements is 1667. Only 67 earnings news reports were made at the weekend, with the rest being reported throughout the week and no day showing a significantly higher number of earnings announcements than any other.

Figure 3: Good and Bad news (CAAR) for event window (-20, +20).

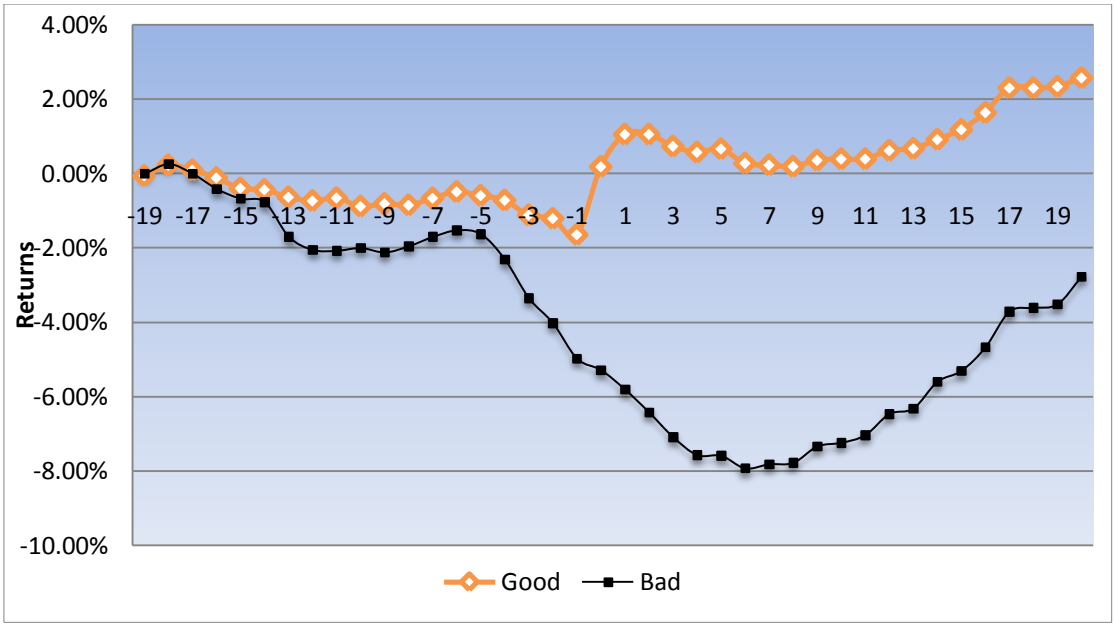


Figure (3) shows the CAAR performance for Good and Bad news portfolios. The good news portfolio (708 observations) are those companies who report positive abnormal returns on announcement days (0, +1). A Bad news portfolio (959 observations) consists of companies which report negative abnormal earnings returns on the announcement days (0, +1). The Good news portfolio does not show strong anticipation to news in the pre-announcement period. However, the bad news portfolio exhibits some reaction to news in the pre-announcement period which can be observed in the period (-14,-5), an indication of some information leakage. The Good news firms show similar PEAD pattern found in many other markets. Conversely, the bad news portfolio seems to overreact to news at first in the period (-5, +7), before a price reversal pattern forms.

Figure 4: Quarter 1-3 Announcements

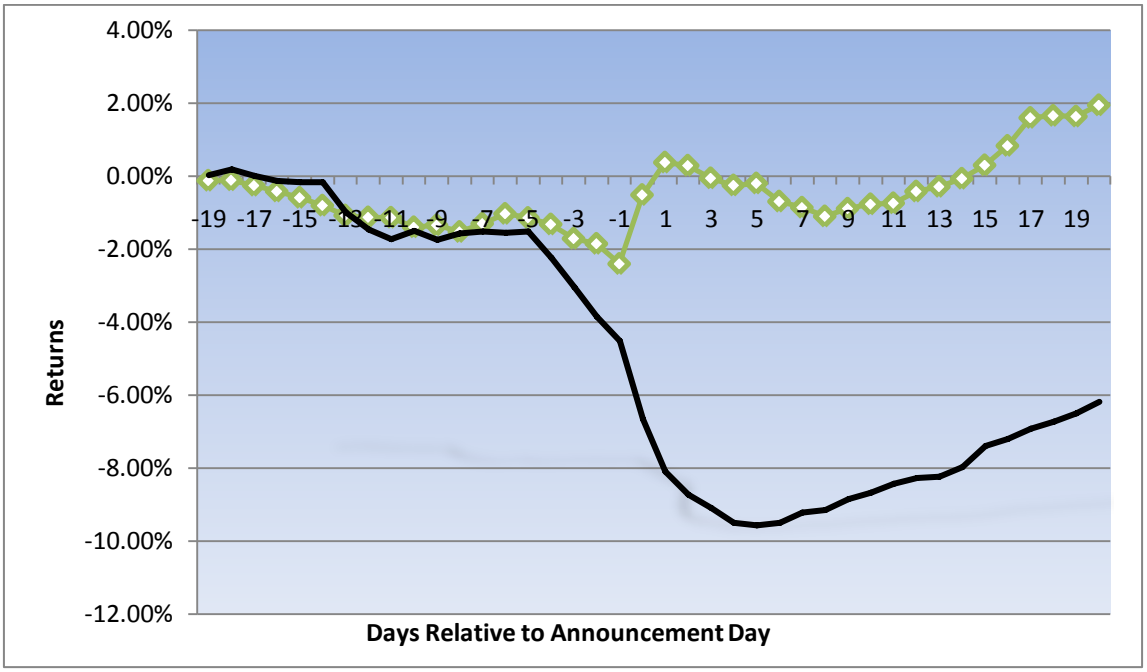
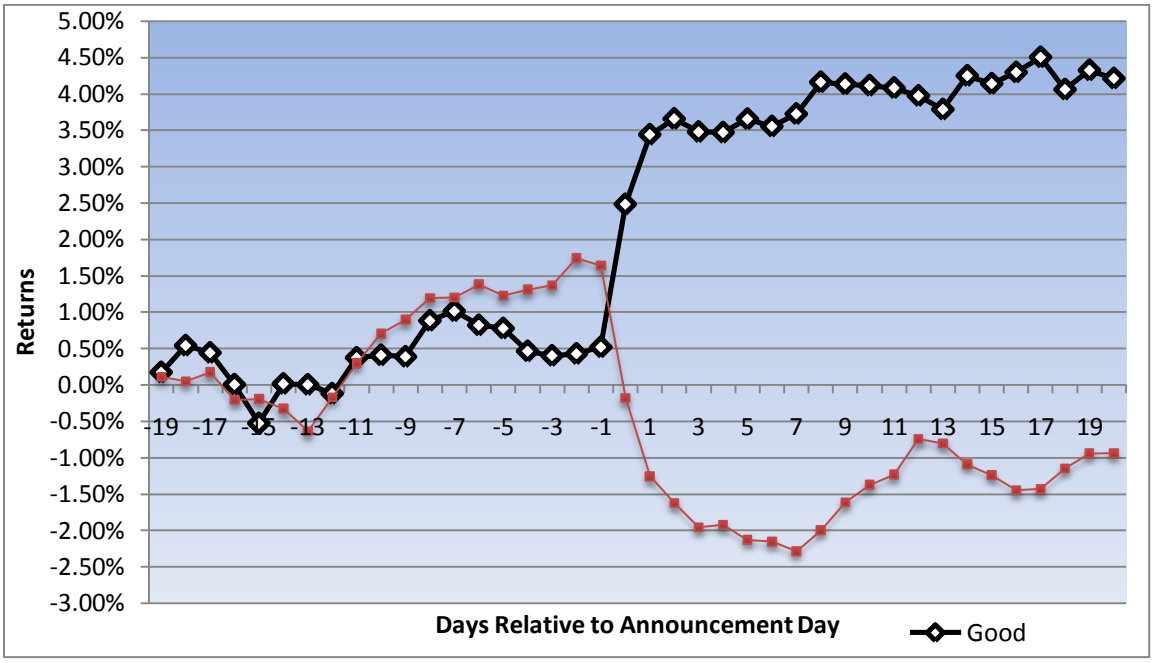


Figure (4) shows CAAR performances for the window (-20, +20) first three quarters (Q1,Q2 and Q3). Good news portfolio (561 observations) = companies achieving positive returns on the announcement days (0, +1). Bad news portfolios (779 observations) = companies achieving negative returns on the announcement days (0,+1). Both portfolio performances show anticipation of the news before the announcement day; however, Bad news firms seem to raise the anticipation of news. The first three quarters were analysed here to examine whether the market could react in a different way for the fourth quarter, when year-end financial reporting is required. By law, the earnings in the first three quarters in the SSM are announced shortly after the quarter's end, whereas the fourth quarter's announcement can be extended to 40 days after the end of the financial year.

Figure 5: Quarter 4 (year-End) Announcements



This figure presents Cumulative average abnormal returns (CAAR) performances over 40 trading days around earning announcements (-20, +20) for the Year-end announcements. The figure shows CAAR for Good news portfolios (144 observations) and Bad news portfolios (208 observations).

[1] A theory stating that stock prices reflect all available information at any given time; see Fama (1965) "Random Walks in Stock Market Prices".

[2] Recently, some regional and local investment banks have started to issue general forecasts for major companies, but these forecasts tend to be general, few and irregular

3 SSM is by far the largest stock exchange in terms of market capitalization and trading volume in the Middle East region. According to the Arab Monetary Fund's annual for the year 2008, which provides statistics for 15 stock markets in the Middle East, the capitalization of the SSM represents 41% of the total market capitalization, and the value traded of the SSM represents 67% of the total stock value traded in all member markets.

[4] A market in which prices have a tendency to rise easily with a considerable show of strength

[5] Most event studies suggest similar procedures or flow of analysis (See for instance, MacKinlay ,1997; Campbell et al. ,1997; Binder, 1998).