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Abstract

Purpose – This study aims to find the response by stock market against the announcements of quarterly earnings is empirically tested by exploiting event study methodology. Efficient market hypothesis (EMH) on Saudi stock exchange is also tried on.

Design/methodology/approach – The market model is applied to help gauge the expected returns and to illustrate abnormal returns around the event date.

Findings – The results established that Saudi Stock Market does not bear semi-strong form of EMH. How efficient is the Saudi market is also reflected through evidence of significant abnormal returns and post-earnings announcement drift around earning announcements dates.

Research limitations/implications – The authors have not used analysts' forecast as the expected earnings which are the limitation. As mentioned earlier, the authors used the quarterly earnings of the previous year as a proxy and that proxy could have been replaced by analysts' forecast. Another limitation is that the trading volume in the event window is not considered.

Practical implications – The behavior of Saudi capital market is of much concern, and the study of this with a perspective of EMH is the significance of this paper.

Social implications – All stakeholders closely watch earnings announcements and its share price movement around the announcement date. Recently, Saudi Arabia has opened its doors to foreign investors, and big foreign investors are going to enter into Saudi capital market, and after their entry, the behavior of market could be different. In the authors' opinion, this is the right time to study the efficiency of Saudi market before the entry of foreign investors.

Originality/value – This study is based on the gap created by EMH of Saudi market using event methodology, observed in the existing literature, and it will be a contribution to literature.

Keywords Market efficiency, Event study, Earnings announcements, Stock price reactions

Paper type Research paper

1. Introduction

Financial information about any company is vital while appraising the value of stock prices. Investors do consider this public financial information to assess the potential future perspective of any firm. Earnings represent the measure of firm's profits or loss from

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business activities and events during a stipulated period. Dividend and earnings announcements are the two most important financial information used by the investors for decisions regarding buying and selling of any firm's share (Lonie and Abeyratna, 1996). A firm's return represents the capital market's measure of performance of the firm over a period. The information of earnings announcements is used by capital market as a yardstick to assess the profitability and financial strength of any firm. New financial information is normally unpredictable by definition; otherwise, it would have been reflected in the share price far before the announcement.

Earnings based on current period for any firm reflects two sorts of information: current period wealth created for equity shareholders and about possible future earnings which will be ultimately distributed to the shareholders. Beaver (1968) described the following three links between earnings announcements and share prices:

(1) earnings of current period provide information to predict earnings of future period;

(2) earnings of current period provide information for expected dividends of future periods; and

(3) earnings of current period provide information to determine the present value of expected future dividends.

The capital market, prior to releasing of announcements, creates expectations and speculations about announcements. The market so reacts to the unexpected announcement of a firm's announced earnings if they differ from the market expected earnings. If the earnings announcement surpasses the expected earnings (normally deliberated to be a good news), share prices will have a surge, and if earnings announcement tilts toward lower side against the expected earnings (seemingly considered as bad news), the share price will decrease. For the market to be considered efficient as per efficient market hypothesis (EMH), a quick and correct adjustment in the share price should be in place after earnings and dividend announcement. The correct adjustment indicates that the prices neither overreact nor underreact to any specific information announcement. It is mandatory for the announcements, whether considered good or bad for any company, that they should be correctly reflected in the share price of the company after they are made public. An event study based on earnings announcement which is reckoned as the central variable of interest and earnings announcements can be used to test the efficiency of any company or market as a whole.

Event study methodology helps to find the promptness of share price movement to newly available financial information to the capital market. For the past four decades, EMH has been the focus of finance field, and EMH's empirical testing has been applied by a number of ways and using different event studies. In their pivotal work, Landsman and Maydew (2002) indicated that after positive earnings surprises, stock prices tend to take a surge and vice versa.

Fama (1970) established that EMH can be further classified into three forms: weak, semi-strong and strong form of market efficiency. When historic market data and past prices are fully reflected in share prices but are unable to predict future prices, any market with this element is considered a weak form. Any market is considered as semi-strong form when all publicly available information is fully reflected in the share price. Finally, any market will be considered as strong form efficient when all available public and private source information is fully reflected in the share price. To determine its weak and semi-strong form, early empirical tests on EMH are conducted. It is the semi-strong form-efficient market where investors cannot use published information as well as historical prices to earn abnormal

returns. The semi-strong efficiency of the market is tested on the earnings announcement information of any company and its prompt and correct adjustment in the share price of the company.

This paper attempts to review event study methodology by measuring the effect of quarterly earnings announcements on share prices for Saudi capital market. Saudi capital market is the biggest capital market of Gulf region and recently opened its doors for foreign investors. Testing of EMH has been done for the developed markets by many researchers, and studies are also available for various developing markets. The testing of semi-strong form of EMH based on event study methodology for Saudi market has never been done before, and it would be of great interest to the researchers and investors to find the efficiency of Saudi market by event study methodology. As compared to old capital markets of the developed countries, Saudi capital markets are relatively new. The behavior Saudi capital market is of much concern, and the study of this with a perspective of EMH is the significance of our paper. Our contribution to the existing literature lies in testing the efficiency of the largest capital market of Arab World by applying event study methodology.

For the investment managers, competitiveness and efficiency of capital markets are of much concern, and they try to exploit any announcement anomalies. For Saudi capital market, behavior of stock prices variability around earning announcement period is interesting to study and to find any post-earning announcement drift or market-under reaction to earning announcements. This study will have implications to the investment and portfolio managers and institutional investors who are interested to find earning surprise and short-term price drift in Saudi capital market, and they can make better investment decisions. This study will find that Saudi capital market is semi-strong efficient or not as per EMH. The study will also give an evidence of presence of significant abnormal returns and post-earnings announcement drift (PEAD) around earning announcements dates in Saudi capital market.

The remainder of this article is organized as follows. Section 2 presents the literature review and theoretical framework. Section 3 presents data and sample description, while Section 4 presents methodology. Section 5 presents analysis and results, and Section 6 concludes this article.

2. Literature review and theoretical framework

Fama *et al.* (1969) presented the theory of efficient market, and it became the most debatable topic in the field of modern finance. Market efficiency concept, according to which price of any financial asset reflects all available information in the market, is the pertinent concept relating to capital markets. Bachelier (2011) concluded "the past, present and even discounted future events are reflected in market price, but often show no apparent relation to price change". EMH emerged as an established concept with the seminal work of Fama (1991) and Fama (1970) and, according to them, a market where the current share prices of any firm represent very good estimates of intrinsic value of the firm given the available information.

At the conceptual level, prior to the difficulty level of empirical testing of the concept, it is difficult to absorb the terminology of market efficiency (Beaver *et al.*, 1979). Dolley (1933) analyzed 95 share splits between 1921 and 1933 and analyzed the price effect of splitting common shares. The seminal work of Landsman and Maydew (2002) and May (1971) are still order of the day with the same approach. Landsman and Maydew (2002) investigated the earnings announcements and their information content, whereas May (1971) concentrated on stock splits after taking out the effect of the simultaneous increase in the

dividend announcements. These preliminary works on EMH and event studies laid the foundation for using event study methodology for empirical testing of market efficiency. Butler and Malaikah (1992) gave a description of event study methods and showed the census of previous literature on event study between 1974 and 2000. They argued that initial statistical calculation format of event study methodology has not changed over time, and it is focused toward on average abnormal returns (AAR) and cumulative average abnormal returns (CAAR). The results of market inefficiencies can be accepted ignorantly without recognizing the misspecification effect of normal return which he termed as hypothesis problem (Fama, 1991). The solution for this problem is to use daily stock data instead of monthly data (Brown and Warner, 1985), which also permits more precise measurement of abnormal returns and more informative studies of announcement effects. Therefore, one important methodological change in event study is the application of daily share price data instead of monthly data (Collins and Dent, 1984; Dyckman *et al.*, 1984; Kothari *et al.*, 2006). These studies concluded that standard parametric event study tests are well specified with good test power when used with daily returns data.

In their seminal work, Landsman and Maydew (2002) argued: "*85 to 90 percent of the net effect of information about annual income is already reflected in security prices by more prompt media which include interim reports*". This showed that only 10-15 per cent content of the announced information is not predicted by the capital market before the earnings announcement. The behavior of price changes affirms that earnings reports possess information content (Beaver, 1968), and share price change in the weeks of quarterly earnings announcements are more than the average share price change (May, 1971) .

Some previous studies also gave insight about the linkage of earnings characteristics and market reaction. The association between forecast errors and unsystematic security returns concludes that information content of earnings "throws away" if the magnitude of the forecast error is ignored (Beaver *et al.*, 1979). The market capitalization of any firm is another factor which leads to the differential amount of pre-disclosure information (Atiase, 1985), whereas higher abnormal returns on earnings announcements are achieved by the smaller firms than the firms with higher market capitalizations (Chambers and Penman, 1984).

Abnormal returns increase at earnings announcements after controlling for risk, whereas in Europe, reported earnings announcements do not provide good measures of the earnings events, as they have been incorporated in share prices during the reporting period, and earnings capture only a weak proportion of the information contain in the share prices (Dumontier and Raffournier, 2002). Abnormal returns can be earned in some specific days around earning announcement date, and earnings announcement had some impacts on stock performance in Ho Chi Minh stock exchange (Corrado and Zivney, 1992) and positive AARs are found in the post dividend declaration period in Oman (Siegel, 1956)

Market reactions to earnings announcements can be investigated to find the decline in the informational content of the earnings announcements. No evidence of a decline in the information content around quarterly earnings announcements is found as measured by both abnormal trading volume and return volatility (Landsman and Maydew, 2002), and price reaction to earnings announcements has increased over time (Buchheit and Kohlbeck, 2002). Price adjustments to information content concerning security valuations are present in "highly favorable" quarterly earnings reports (Joy *et al.*, 1977) and information content of interim earnings announcements differ between small and large investors and that small trader regard earnings announcements as more informative than large traders (Vieru, 2002). Market reactions to earnings announcements have increased over the period, and the

informativeness of earnings announcements is not battered by analyst reports (Ball and Shivakumar, 2008; Francis *et al.*, 2002).

Previous studies also found the evidence of capital market anomaly known as PEAD. As per PAED, cumulative abnormal returns may drift for a number of days or weeks in earnings announcements if any surprise is found in the announcements. It was primarily calculated by Landsman and Maydew (2002) and called it as standardized unexpected earnings (SUE). There is a discrete jump in the stock price around both "Good" and "Bad" earnings announcement in Turkish stock exchange, and the cumulative abnormal returns response significantly to "Bad" earnings news for the event window which support the validation of post-earnings announcement drift anomaly in Turkish Stock Market (Malhotra *et al.*, 2015). The standard deviation of reporting lag times for quarter reports is three to four days (Chambers and Penman, 1984), whereas PEAD is not found in Brussels Stock Exchange (van Huffel *et al.*, 1996). Large trades produce greater permanent price effects before an announcement than after it, and large trades are associated with price changes before an announcement, and for small trades, the results were insignificant on Helsinki stock exchange (Vieru, 2002). An investor's overreaction to extreme SUE signals is found and investors do not underreact to earnings news (Alwathainani *et al.*, 2016), while earnings announcements generate abnormally high trading volume and return variations in both US and Chinese markets (Yuan and Xiao, 2014).

Some researchers argue that capital market should not be considered as semi-strong form, and the investors have the tendency to generate abnormal returns based on publicly available information in the market, but the results are contradictory among researchers. Capital markets are not semi-strong efficient (Charles and Darné, 2009; Deshmukh *et al.*, 2008; Guidi, 2010; Kim *et al.*, 2011; Lim and Brooks, 2011; Metghalchi *et al.*, 2008); on the contrary, there is an idea of market efficiency and that capital markets are semi-strong efficient (Laopodis, 2009; Louhichi, 2008; Louhichi, 2012; Simpson *et al.*, 2009; Wang and Corbett, 2008).

The relation of earnings announcement with stock returns around earnings announcements period has been established by many researchers such as Beaver (1968), Chari *et al.* (1988), Joy *et al.* (1977), Landsman and Maydew (2002) and May (1971) for the American capital markets; Opong (1995) and Pope and Inyangete (1992) for the UK market; Pellicer and Rees (1999) for Spain; Yuan and Xiao (2014) for China; Louhichi (2008) for France; Berezovskis *et al.* (2010) for the Baltics; and Corrado and Zivney (1992) for Vietnam. In contrast, researchers such as Siegel (1956) for China, Wilcoxon (1945) for Denmark and Das *et al.* (2008) argued against any association between earnings announcements and stock returns.

As discussed, the results are mixed for different markets, and some markets are found semi-strong efficient, while others not in the previous studies using different methodologies. The same is the case for Middle East markets. EMH in Saudi market is rejected by Budd (2012) by using variance ratio tests. The author depicted that the returns can be predictable and opportunities for arbitrage and abnormal profit making are available. It is difficult to determine whether the Saudi market is informational, or merely operationally, inefficient because of high transaction costs (Butler and Malaikah, 1992). Gulf Cooperation Council (GCC) stock markets are not weak form efficient, as past price movements of one GCC market can be used to predict the current price movement of another GCC stock market (Jamaani and Roca, 2015). Saudi market is an efficient market by finding the dynamics of the relationship between bank loans and stock returns (Almutai, 2015), whereas there is no significant reaction of prices to the dividend announcements for Saudi market using signaling theory (Qudah and Badawi, 2014). Saudi Stock Market underreact to positive news

and overreact to positive news (Alzahrani and Skerratt, 2010), and Saudi stock market is the weak form market efficient for all share prices and 11 individual sectors by using four different tests (Asiri and Alzeera, 2013).

We have mixed results for the efficiency of Saudi market in different studies using methodologies; therefore, it would be very interesting to study the efficiency of Saudi market by event study methodology which is the best way to test the market efficiency.

However, all these studies on Saudi stock market do not involve event study methodology for testing the EMH. For the first time, an event study methodology will be adopted surrounding the release of earnings announcements on Saudi market with the intent of examining the extent of market efficiency and the reaction of share prices to potentially new information contained within earnings announcements. The only study on Saudi stock market was conducted before the restructuring of Saudi TASI index in 2008 (Asiri and Alzeera, 2013). The objective of this paper is to find the relationship between unexpected earnings measures and abnormal share returns if it exists. This study examines the importance and appropriateness of earnings announcements for academicians, regulators and investors. More so, this study is based on the gap in existing literature about EMH of Saudi market using event methodology, and it will be a contribution to literature, as all stakeholders closely watch earnings announcements and its share price movement around the announcement date. Recently, Saudi Arabia has opened its doors for foreign investors[1], and big foreign investors are going to enter into Saudi capital market[2], and after their entry, the behavior of market could be different. In authors' opinion, this is the right time to study the efficiency of Saudi market before the entry of foreign investors.

EMH will be tested for Saudi Arabia market in a semi-efficient form, and earnings surprises will be calculated in abnormal returns along with an observation of drift in cumulative abnormal returns. The theoretical framework of EMH and literature review forms the basis for our null hypothesis:

Ho. Abnormal returns are not significantly different from zero in quarterly earnings announcements.

3. Sample and data description

Listed companies of Saudi Stock Exchange (Tadawul) which have announced their earnings per share (EPS) on a quarterly basis were used for estimation window. The period for this study is from 2009 to 2014, and the companies, having insufficient data of earnings announcements, were excluded from the sample. This excluded a number of listed companies, and our final data consist of 115 firms, and the total number of events used for analysis is 1,601. A daily closing price of Tadawul All Share Index (TASI) is used to find out the market return, and the data are collected from BLOOMBERG terminals. Event day is defined as a day when any company made the quarterly announcement of EPS and the company's share was traded on that day. Next trading day was used as an event day if the stocks were not traded on the day of announcements due to holiday in the stock market (Table I).

4. Methodology

Event study methodology is used to test how efficient is the Saudi capital market. EPS is the portion of a profit allocated to each outstanding share of common stock of a company. EPS is as an indicator of profitability and is calculated as:

$$\text{EPS} = \frac{\text{Net income} - \text{Dividends on preferred stocks}}{\text{Average outstanding shares}}$$

The surprise element of any earnings announcement can be calculated by measuring expected EPS and the methodology used by Bernard and Thomas (1989). They used the expected EPS as the EPS from the same quarter of past year, and the same methodology for calculating the expected EPS will be used in this paper. Some studies use analyst forecast as expected EPS (Wilcoxon, 1945). The event will be categorized as good news, bad news or no news if the difference between actual and expected earnings (surprise element) is more than ±10 per cent or between ±10 per cent.

Abnormal returns or excess returns were computed by subtracting the normal return of the security from actual return of any security over the event window. In this paper, 21-day event window is used to calculate the abnormal returns of the security and 21 days' event window consists of 10 trading days before and 10 trading days after the event (Ball and Kothari, 1991; Capstaff *et al.*, 2004; Hussin *et al.*, 2010).

The abnormal returns are computed as per (MacKinlay, 1997):

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

where,

R_{it} = Actual returns of security *i* at time *t*

The estimated market model of (Sharpe, 1964) is used:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad \text{for i} = 1 \ldots\ldots \text{N}$$

where,

$E(R_{it})$ = Expected returns of security *i* during time period *t*;
a_i = Intercept of a straight line or alpha coefficient for security *i*;
β_i = Slope of a straight line or beta coefficient for security *i*;
R_{mt} = Actual returns of market portfolio (TASI) at time *t*; and
ε_{it} = Disturbance/error term of security *i* at time *t*.

Ordinary least square method is used to calculate the market model in this study. Estimation window consisting of 250 days has been used which is considered to be large enough to have an assumption that expected disturbance term ε_{it} will be zero:

$$E(\varepsilon_{it}) = 0$$

The variance of disturbance/error term is homoscedastic as shown:

Event classification for the period 2010- 2014

Event category	No. of events
Good	604
Bad	694
No news	303
Total	**1,601**

Table I. Number of earnings announcements classified as per surprise element

$$\mathrm{var}(\varepsilon_{it}) = \sigma^2_{\varepsilon}$$

The estimated market model can be written as:

$$\mathrm{E}(\mathrm{R}_{\mathrm{it}}) = \alpha_i + \beta_i \mathrm{R}_{\mathrm{mt}}$$

The AAR_{it} is the average deviation of actual returns of a security i from expected returns on day t. For n given events, an AAR_{it} for day t is:

$$\mathrm{AAR}_{it} = \frac{1}{\mathrm{n}} \sum_{i=1}^{\mathrm{n}} \mathrm{AR}_{it}$$

For large estimation window, its variance is:

$$\mathrm{var}(\mathrm{AAR}_{it}) = \frac{1}{\mathrm{n}^2} \sum_{i=1}^{\mathrm{n}} \sigma^2_{\varepsilon}$$

AAR is calculated by taking the averages cross-sectionally. These AARs were summed over the event window and CAAR is calculated:

$$\mathrm{CAAR}_K = \sum_{\mathrm{k}} \mathrm{AAR}_{\mathrm{it}}$$

where:

$k = -10,....0.0,. . ., +10$

The variance is:

$$\mathrm{var}(\mathrm{CAAR}_K) = \sum_{\mathrm{t}=t1}^{t2} \mathrm{var}(\mathrm{AAR}_t)$$

Assuming the normal distribution of CAAR, the inferences can be drawn by standardizing CAAR to test whether CAAR equals to zero. The test statistic θ_1 can be written as:

$$\theta = \frac{\mathrm{CAAR}_K}{\sqrt{\mathrm{var}(\mathrm{CAAR}_K)}} \sim \mathrm{N}(0,1)$$

If null hypothesis is rejected, it will show that the CAARs are significantly different from zero, and the earnings announcement event will effect stock prices (Liljeblom and Vaihekoski, 2004).

Robustness tests have been conducted to check the validity of model used in the study. As normality is an issue of concern with return data from Tadawul, sign and ranks tests are best appropriate for robustness tests. Nonparametric ranks and sign tests are well specified with reruns data, while standard parametric event study tests can be poorly specified (Corrado and Truong, 2008). Standard parametric event study tests were poorly specified with Nasdaq returns, and nonparametric rank test is better specified with these

data (Campbell and Wesley, 1993). Rank test outperformed nonparametric test in Toronto stock exchange (Maynes and Rumsey, 1993) and in Copenhagen stock exchange (Bartholdy *et al.*, 2007).

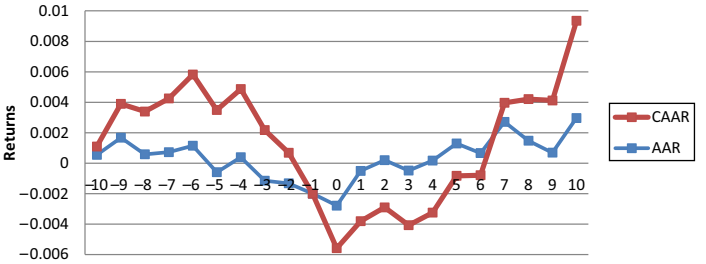
5. Analysis and results

As indicated in Figure 1, the CAAR for positive or good news start moving up 10 days before the event, and it reaches a peak 6 days before the earnings announcements are made. CAAR starts moving downward from Day 6 onward, and surprisingly, it becomes negative from Day 1 prior to announcements, and it stays negative until the sixth day after the announcement is made. It comes to positive range from Day 6 onward after the event. The AAR for good news also behaves in the same manner, except it again touches back the positive value at the fourth day after the announcement.

Figure 2 indicates CAAR and AAR for earnings announcements covering bad news. CAAR shows stable behavior at the start of the event window; from the fourth day prior to the earnings announcement, it begins to visibly decline and continues this trend until the fifth day after the announcement event. Later on, it begins to get stable. The AAR in this case shows stable behavior.

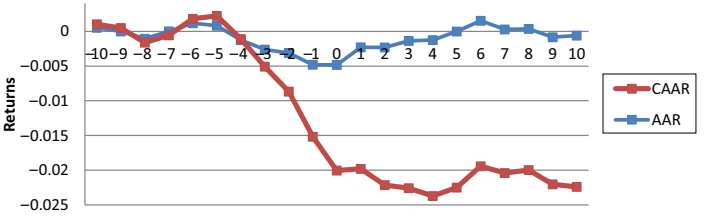
Figure 3 indicates CAAR and AAR behavior in case of no news; the CAAR starts from negative, shows a steep dip from Day 3 before the announcement then afterward stays in the negative range.

As discussed in methodology, we apply test statistics θ. The test is applied to assess the statistical significance of aforementioned AAR and CAAR for stocks. Furthermore, it is



Note: Horizontal axis shows event window of 21 days (10 days before event and 10 days after event)

Figure 1.
AAR and CAAR for good news



Note: Horizontal axis shows event window of 21 days (10 days before event and 10 days after event)

Figure 2.
AAR and CAAR for bad news

applied for all the three earnings announcement categories. Tables II and III present the results of the test statistics.

Table II provides the results for AAR. It is evident from the results that the absolute value of AAR is greater in the case of the negative earnings shocks (i.e. bad news) sample

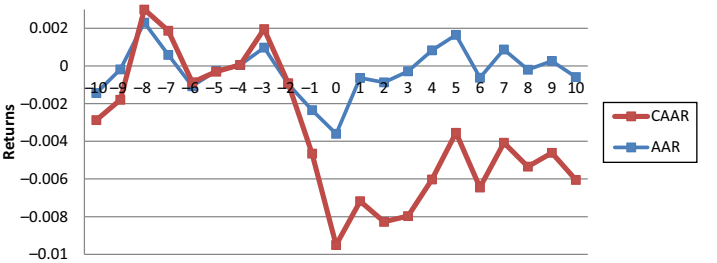


Figure 3.
AAR and CAAR for no news

Note: Horizontal axis shows event window of 21 days (10 days before event and 10 days after event)

	AAR					
	Good news		Bad news		No news	
Day	ARR (%)	*p*-value	ARR(%)	*p*-value	ARR(%)	*p*-value
−10	0.05	0.502	0.05	0.539	−0.14	0.143
−9	0.17	0.040**	0.00	0.988	−0.02	0.855
−8	0.06	0.473	−0.11	0.202	0.23	0.019**
−7	0.07	0.375	0.00	1.000	0.06	0.546
−6	0.11	0.160	0.12	0.156	−0.11	0.273
−5	−0.06	0.468	0.08	0.330	−0.03	0.793
−4	0.04	0.630	−0.13	0.129	0.01	0.957
−3	−0.12	0.158	−0.26	0.002*	0.10	0.317
−2	−0.13	0.105	−0.31	0.000*	−0.09	0.333
−1	−0.20	0.01*	−0.48	0.000*	−0.23	0.017**
0	−0.28	0.001*	−0.48	0.000*	−0.36	0.000*
1	−0.05	0.532	−0.23	0.006*	−0.06	0.516
2	0.02	0.809	−0.23	0.005*	−0.09	0.375
3	−0.05	0.552	−0.14	0.098	−0.03	0.774
4	0.02	0.834	−0.13	0.131	0.08	0.395
5	0.13	0.112	0.00	0.982	0.17	0.091
6	0.07	0.413	0.15	0.067	−0.06	0.523
7	0.27	0.001*	0.03	0.741	0.09	0.370
8	0.15	0.070	0.04	0.672	−0.02	0.841
9	0.07	0.395	−0.08	0.307	0.03	0.784
10	0.30	0.000*	−0.06	0.462	−0.06	0.549

Table II.
Result of the test statistics for AARs and corresponding *p*-values in 21 days' event window

Notes: Table II shows AAR values and corresponding *p*-values for 21 days' event window with classification as good news, bad news and no news. First column (Days) show 21 days' event window. −10 to −1 are 10 days before event, 0 is the event day and 1 to 10 days are 10 days after event day. ARR is the average deviation of actual returns of a security from expected returns; *significance at 1% level; **significance at 5% level

	CAAR					
	Good news		Bad news		No news	
Day	ARR (%)	*p*-value	ARR (%)	*p*-value	ARR (%)	*p*-value
−10	0.05	0.50	0.05	0.54	−0.14	0.14
−9	0.22	0.05**	0.05	0.55	−0.16	0.25
−8	0.28	0.05**	−0.06	0.50	0.07	0.68
−7	0.35	0.03**	−0.06	0.50	0.13	0.51
−6	0.47	0.01*	0.06	0.46	0.02	0.92
−5	0.41	0.04**	0.14	0.09	0.00	0.98
−4	0.45	0.04**	0.02	0.84	0.00	1.00
−3	0.33	0.15	−0.25	0.00*	0.10	0.72
−2	0.20	0.41	−0.56	0.00*	0.00	0.99
−1	0.00	1.00	−1.04	0.00*	−0.23	0.46
0	−0.28	0.30	−1.52	0.00*	−0.59	0.07
1	−0.33	0.24	−1.75	0.00*	−0.65	0.06
2	−0.31	0.29	−1.98	0.00*	−0.74	0.04**
3	−0.36	0.24	−2.12	0.00*	−0.77	0.04**
4	−0.34	0.28	−2.25	0.00*	−0.69	0.07
5	−0.21	0.51	−2.25	0.00*	−0.52	0.19
6	−0.15	0.66	−2.09	0.00*	−0.58	0.15
7	0.13	0.72	−2.07	0.00*	−0.50	0.24
8	0.27	0.44	−2.03	0.00*	−0.51	0.23
9	0.34	0.35	−2.12	0.00*	−0.49	0.27
10	0.64	0.09	−2.18	0.00*	−0.55	0.23

Notes: Table III shows AAR values and corresponding *p*-values for 21 days' event window with classification as good news, bad news and no news. First column (Days) show 21 days' event window. −10 to −1 are 10 days before event, 0 is the event day and 1 to 10 days are 10 days after event day. ARR is the average deviation of actual returns of a security from expected returns; *significance at 1% level; **significance at 5% level

Table III. Result of the test statistics for cumulative CAAR and corresponding *p*-values in 21 days' event window

compared to positive earnings shocks (i.e. good news) sample. This observation is true for the pre-event window, post-event window and day of the event. This specifies that compared to good news, sample market reacts more strongly in bad news sample.

The results of the test statistics indicate that the reaction of the stock returns for numerous days in event window appears to be statistically significant (at conventional, 1 to 5 per cent significance levels). This observation is valid both in the cases of good and bad new category firms. Especially in the case of negative news, the significance level is quite consistent and continuous on and around the day of earnings announcements. These significant abnormal returns found in event window do not support the hypothesis of semi-strong form of efficient markets. The results obtained from data analysis are not different from expectations. These show the significant AAR and CAAR in the event windows. As

	AAR			CARR		
Test	Good news	Bad news	No news	Good news	Bad news	No news
Sign test	*0.75*	*1.0*	*0.75*	*0.11*	*0.00***	*0.00***
Wilcoxon rank test	*0.20*	*0.61*	*0.48*	*0.07*	*0.00***	*0.00***

Note: ** *p*-value at 95% significance level; tests for related samples has been used

Table IV. Sign test and wilcoxon rank test

discussed earlier, the nature of news depends on the deviation of the actual announcement from the expected EPS, the assumed threshold is + (−) 10 per cent.

As described in methodology, the test statistics θ was applied to all the three earnings announcement categories. After analyzing the results for earning announcements of good and bad news categories, it may be concluded that null hypothesis for both positive and negative news categories is rejected. However, the null hypothesis is more convincingly rejected for the firms with negative announcements. Similarly, the firms with no news (no information shocks) also generate few significant abnormal returns on and around announcement date.

The result of this study indicates that earnings announcements, for the positive earnings surprises, depict the significant positive AAR for few days preceding the event day. Furthermore, these significant positive AARs for good news category were witnessed only on Day 9 and one day prior to the event and on the day of the event. However, the PEAD was only observed on Day 7 and 10 in good news category after the announcement. Moreover, in case of bad news, significant negative abnormal returns were also witnessed in event window, starting from few days before the announcement, on the day of the announcement and these continue till the second day after event. The majority of the available literature on the topic suggest further probe into the matter. The conclusions made only on the basis of AAR are not considered sufficient.

Therefore, to obtain robust results, we developed the CAAR by aggregating AAR. These results for CAAR are discussed as under.

The CAAR for the firms with positive earnings announcements is not found statistically significant for 21 days' window length. However, the CAARs for the days prior to event day and especially from the Day 9 to Day 4 in event window is significant and positive. This phenomenon indicates that earnings positive news announcement yields in significant positive abnormal returns prior to the earnings announcements.

On the other hand, in the case of negative earnings announcements, the obtained result indicates that such events cause the significant negative AARs. These negative returns can be observed on the days around the earnings announcement over the event window. In the case of the companies with negative surprises, the AAR declined by 0.48 per cent; on the event day, this result is statistically significant at 1 per cent significance level. The CAAR for 21 days' event window was −2.18 per cent for the firms with negative news sample. The result is also statistically significant at 1 per cent significance level.

The results indicate that events with no news (i.e. no earnings surprises) do not cause significant AAR on the days around the event for the entire window length. Although, a day before and on the event day, significant negative AAR are witnessed, but these did not produce any drift over the event window. Likewise, for full event window length, CAAR for no news category do not exhibit any statistical significant except on Day 2 and Day 3 following the event window.

6. Conclusion

In this study, we compute AAR and CAAR around earnings announcements to measure the information efficiency of earnings announcements in the Saudi Arabian capital market. To investigate the announcements' effects, we consider quarterly earnings disclosures made by the listed companies of Tadawul. This study aimed at testing the EMH in the Tadawul, scrutinizing the impact of information efficacy in earnings announcement and existence of abnormal returns. This study filled the gap in existing literature about the efficiency of Saudi market. We used event study approach to probe the relationship of corporate earnings announcements and stock price reactions. First, we estimated normal returns, using market model; subsequently, these returns were used to calculate abnormal returns for the stock

price. The research of our paper does not support semi-strong form of EMH, as significant abnormal returns were found in the days around announcement event. These significant abnormal returns witnessed on and around the event day also infer that the information contents exhibited by earnings announcements are considered useful by the market.

Moreover, results of the study suggest the bad news samples cause more a strong market reaction as compared to good news sample particularly on announcement day; this observation is in line with the findings of previous studies.

In negative earnings surprise sample, especially for CAAR, we also observe a strong post-announcement drift. This result is in line with the EMH. It suggests that investors delayed their response more for bad news events than the good news events. The fact exhibits that security prices underreact to earnings announcements which results into post earnings announcement drift.

Finally, we conclude that semi- strong form EMH does not hold in Saudi Stock Market. This is particularly true in this scenario as we find a strong evidence of significant abnormal returns and post-announcement drift. However, the aforementioned limitations of the study should not be ignored. Besides, this is the first step, and we expect researchers will provide additional insights into the impact of earnings announcements in the growing Saudi Stock Market in the future.

Furthermore, we have not used analysts' forecast as the expected earnings which are our limitation. As mentioned earlier, we have based the quarterly earnings of the previous year as a proxy, and that proxy could have been replaced by analysts' forecast. Another limitation is not to consider the trading volume in the event window.

This study can be used as groundwork for analyzing Saudi market by segregating based on firm size or different sectors of the market. Another important direction of future research would be to study the market behavior after the investments made by foreign investors.

Notes

1. http://money.cnn.com/2015/06/15/investing/saudi-arabia-market-open/
2. www.ft.com/intl/cms/s/0/a82a686a-129d-11e5-bcc2-00144feabdc0.html#axzz3xs5IdqH3

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Further reading

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