The Impact of Earnings Announcements on Stock Price Movement: A Comparison between the Industrial and Basic Materials Sectors on the Johannesburg Stock Exchange

by

Ayesha Baradien[1], Lucian Pitt[2], and Akios Majoni[3]
Department of Finance and Tax,
University of Cape Town, Private Bag,
Rondebosch 7701, South Africa
E-mail: BRDAYE001@myuct.ac.za[1], Lucian.pitt@uct.ac.za[2], akios.majoni@uct.ac.za[3]

IJMBE International Journal of Management, Business, and Economics

The Impact of Earnings Announcements on Stock Price Movement: A Comparison between the Industrial and Basic Materials Sectors on the Johannesburg Stock Exchange

by

Ayesha Baradien[1], Lucian Pitt[2], and Akios Majoni[3]
Department of Finance and Tax,
University of Cape Town, Private Bag,
Rondebosch 7701, South Africa
E-mail: BRDAYE001@myuct.ac.za[1], Lucian.pitt@uct.ac.za[2], akios.majoni@uct.ac.za[3]

Abstract

The Efficient Market Hypothesis posits that the observed market price of securities a reflection of the fair value of the security. Since the market price efficiently factors in all available information relevant to that security, opportunities available to gain significant abnormal returns should be bear zero. This study tests efficiency of the Industrial and Basic Materials sectors of the Johannesburg Stock Exchange by looking for evidence of significant abnormal returns subsequent to public earnings announcements by listed companies. A cross sector analyses determines whether certain Industrial and Basic Materials sectors exhibit different degrees of efficiency. The findings show a lack of statistically significant abnormal returns on a cumulative basis for then two sectors. The results show evidence of statistically significant abnormal returns for the Basic materials Sector. There is however, no evidence that these average abnormal returns are prevalent on a consistent basis and therefore the efficient market hypothesis cannot be refuted. These findings show that opportunities to exploit mispriced securities are limited, which (in theory) assumes that potential gains from active portfolio management are limited.

Keywords: Average Abnormal Returns (AAR), Cumulative Abnormal Average Returns (CAAR), Johannesburg Stock Exchange (JSE), Efficient Market Hypothesis (EMH).

1 Introduction

If markets are indeed efficient and prices adjust instantaneously to new information then there would be no abnormal profits on offer and no arbitrage opportunity (Malkiel, 2003). However, studies have shown that some markets are not as efficient and that above average returns exist (Taylor, 1982; Malkiel, 2005). Other studies have shown that markets are both efficient and inefficient (Ball, 1994). This study will analyse and compare market efficiency of two sectors on the Johannesburg Stock Exchange. The paper consists of several sections. It starts with previous research relating to the topic under investigation followed by the hypothesis formulation, a note on the sample and data collection, an outline of the methodology adopted and a review and discussion of the empirical findings.

2 Literature Review

2.1 Market Efficiency

Markets are generally defined as weak, semi-strong and strong-from efficient (Fama, 1970). Each level shows the extent to which information, ranging from past information (weak form), to past and current information (semi-strong form) and past, current and private information (strong form), is reflected in stock prices.

The basis assumption that underpins marekt effciency is that investors behave rationally. If matkets are rational prices should follow a "random walk" which Fama (1970) defines as movement around an assumed equilibrium price without statistically significant deviation fromt the equilibrium price. Taylor (1982) who found empirical evidence that points to a price- trend hypothesis (i.e. the slow movement of information into stock prices resulting in a price trend rather than a random walk). Thaler (1993) and Schleifer (2000) that investors do not behave rational, they found that, because of irrational behaviour, persistent analytical errors exist which result in security prices deviating from assumed equilibrium.

Studies that are more recent have supported the EMH. Malkiel (2005) found prices seem to hold all available information with evidence showing that even though professional investors are highly incentivised to beat the market, they are still unable to do so consistently. Their study found that Index Funds in U.S and Europe tend to outperform the actively managed fund. Yen & Lee (2008) support the view of many scholars that even though the capital market has its flaws, it remains the most efficient market in its ability to process information.

Bhana (1997), found that significant positive abnormal returns were observed for a period of up to 20 trading days after a dividend announcement by companies listed on the Johannesburg Stock Exchange (JSE). The study found that these abnormal returns are higher in the event of larger and unexpected share dividends. Whilst Bhana has found evidence market inefficiency, a later study by Mabhunu (2004) found that little evidence that successive price changes on shares listed on the JSE were dependent, pointing to evidence of market efficiency. For share prices of companies listed on the Alternative Index of the JSE, Mlonzi, Kruger, & Nthoesane (2011) found that the JSE ALtX exhibits the weak-form of market efficiency, as seen by significant cumalative losses being made in the 16^{th} and 5^{th} day of the event window after an earnings announcement.

2.2 Post Earnings Announcement Drift

Post earnings announcement drift (PEAD) refers to the trend in cumulative earnings following and earnings announcement. This trend usually lasts for weeks/months in relation to specific earnings information. Freeman & Tse (1989), Bernard & Thomas (1990), and Bartov (1992) found evidence that the PEAD drift is representative of market's inability to capture all information in stock prices instantaneously.

Bernard & Thomas (1989) segregate the possible reasons for this drift into two main categories. Firstly, they discuss how the price reaction is delayed with response to new information either because traders do not integrate this information or because the costs are too high to exploit the information. Secondly, the drift is said to be due to the inefficiency of the capital asset pricing model (CAPM), which results in the returns not being fully attuned to risk. Therefore, "the so-called abnormal returns are nothing more than fair compensation for bearing risk that is priced but not captured by the CAPM" (Bernard & Thomas, 1989).

Chordia & Shivakumar (2005) argue that the PEAD anomaly could be partially due to the inflation illusion, as inflation is not taken into account on future earnings growth. Chordia, et. al. (2009), found that PEAD is found mostly in stocks that are highly illiquid. They found that these high transaction costs eroded the positive abnormal returns caused by the PAED for illiquid stocks. Similar findings by Bhushan (1994) suggest that the drift may still exist in markets that are "informationally" efficient up to transaction costs, as investors will not engage in any arbitrage opportunity if transaction costs are not covered.

3 Data and Methodology

3.1 Hypothesis

The main objective of the following study was to investigate the efficiency of the Industrial Sector and the Basic Materials Sector of the JSE. Efficiency is determined by looking at the significance of the abnormal returns that each of the sectors attained, on an absolute and cumulative basis, following a public earnings announcement. The hypothesis formulated is therefore:

Hypothesis A:

H_o: $AAR_t = 0$

H_1: $AAR_t \neq 0$

Hypothesis B:

H_o: $CAAR_t = 0$

H_1: $CAAR_t \neq 0$

The null hypothesis (H_o) states that the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR)) are not significantly different from zero, implying efficiency within the sector.

The alternate hypothesis (H_1) above states that the Average Abnormal Returns (AAR) and the Cumulative Average Abnormal Returns (CAAR) are significantly different from zero, implying inefficiency within the sector.

3.2 Data

The data chosen for the study covers the period 1 January 2012 to 31 December 2012. A random sample of 79 companies out of the Industrial Sector and 29 companies out of the Basic Materials Sector was taken. The companies in each sample were then analysed according to the following criteria:

- Each company had to have an annual public earnings announcement, shown on the JSE News Services. These were checked via the McGregor Database.
- Companies should have been listed for 5 years or more. This was to ensure that enough data was available to calculate the beta of each of the companies. This data was retrieved from the Datastream database.
- The companies had to have been actively trading; this was to ensure that the effect of thin trading was taken out as it could have distorted our results significantly (Bowie, 1994).
- Companies should not have had any other cofounding events within the event window. This was to ensure that any changes found in stock prices were due to the public earnings announcement and not other company related events. Cofounding events were found in the JSE News Services via McGregor.

If any of the companies failed to meet the requirements, they were taken out of the sample. This resulted in the sample sizes reducing to 59 companies in the Industrial Sector and 23 companies in the Basic Materials Sector.

3.3 Methodology

The event study methodology was used within this study to test for abnormal returns among sectors surrounding the public earnings announcement. The event window investigated was 10 days prior to the event date, the event day (day of public earnings announcement) as well as 5 days after the event.

Event window: t= -10, +5

In order to calculate the required returns of each of the shares, the CAPM was applied. There are several arguments against the use of CAPM, Bernard & Thomas (1989) state that the inefficiency of CAPM, makes any abnormal return simply a compensation for bearing risk that is priced but not captured by CAPM. However, Nichols (1993) states that there is yet to be a workable alternative, and with a survey done by Bruner, Eades, & Harris (1998) which showed that the dominant model for estimating the cost of equity among 27 highly regarded corporations and ten leading financial advisers is in fact the CAPM model, justifies the use of CAPM in this study.
CAPM:

$$E(R)_{jt} = Rf_t + \beta_j (R_{mt} - Rf_t)$$

- $E(R)_{jt}$ = required return for security *j* on day *t*
- R_{mt} = market return, on day *t*
- R_{ft} = risk-free rate in period *t*.
- β_j = a measure of the volatility of a security in comparison to the market.

$$\beta_j = Cov (R_{j,} R_{mt}) / Var (R_{mt})$$

- $Cov(R_{j,}R_{mt})$ = covariance or correlation coefficient between the returns of an individual stock and the returns on the market.
- $Var(R_{mt})$ = variance of returns on the market

In the calculation of CAPM, the long-term 10-year R186 government bond was used as Bruner, Eades, & Harris (1998) suggests that long term bond yields more closely reflect the default free holding period returns. Also, in terms of the beta, monthly data of 5 years was used to calculate the beta's for each of the companies in there respective sample sectors. Bruner, Eades, & Harris (1998) discuss that increasing the time periods can increase the statistical reliability and reduce the unwanted noise (imperfect information) from shorter time periods (e.g. days) .

3.3.1 Calculation of returns

The daily share price was calculated for every company in each sector using log returns (equation 1). The actual return for each share was then deducted from these log returns in order to determine whether abnormal returns were made (equation 2).

Equation 1: $R_{jt} = \log(P_{jt} / P_{jt} - 1)$	**Equation 2:** $AR_{jt} = R_{jt} - E(R_{jt})$
Where: R_{jt} = the share price return for security *j* for day *t* P_{jt} = the share price of security *j* at the end of day *t*.	**Where:** AR_{jt} = the abnormal return of security *j* in period *t* $E(R_{jt})$ = the required share price return of security *j* in period *t* R_{jt} = actual return of security *j* in period *t*.

These abnormal returns were then averaged per sector across all of the companies within the sample on each day of the 16 day event window using the equation 3. Similarly, the cumulative abnormal average return was calculated using equation 4.

Equation 3: $AARt = \sum_{j=1}^{N} ARjt/N$	**Equation 4:** $CAARt = \sum_{j=1}^{N} CARjt/N$

3.3.2 Testing for statistical significance

In order to determine whether our null hypothesis should be rejected or accepted, critical values were calculated to ascertain whether these results are statistically different. These results were tested on a 90% ; 95% as well as a 99% confidence interval. In sample sizes where the number of companies in each sector was less than 30, the t- distribution was used with (n-1) degrees of freedom. In sample sizes where the number of companies exceeded 30, the z- score was used to determine the critical values, as sample sizes larger than 30 are assumed to follow a normal distribution. The following equations were used as per the Mlonzi, Kruger, & Nthoesane (2011) article. However a slight difference was made in order to determine the CAAR critical value. Mlonzi, Kruger, & Nthoesane (2011) uses the standard deviation of the AAR in determining the CAAR critical value, however in this study the standard deviation of the CAAR was used in order to accurately reflect the standard error of the CAAR returns.

Equation 5: $t_{AAR} = \frac{AAR\,j}{\frac{\sigma(AAR)}{\sqrt{n}}}$	**Equation 6:** $t_{CAAR} = \frac{CAAR\,jt}{\sigma(CAAR)\ d^{0.5}}$
Where: n = the number of companies used in each sample d = the cumulative number of days	

4 Results and Discussion

4.1 Average Abnormal Returns (see tables 1 and 2)

A summary of the AAR and CAAR results are tabulated for the two sectors under investigation. These results are calculated using a 99%, 95% as well as a 90% confidence interval.

Table 1: Average Abnormal Returns (AAR) and t- values surrounding the announcement date of companies in the Basic Materials Sector.

Event Window	AAR (%)	T-Stat (2 Tailed) Confidence Interval		
		99%	95%	90%
-10	*0,68*	***3,91***	***3,91***	***3,91***
-9	*0,48*	2,77	**2,77**	**2,77**
-8	*0,55*	***3,16***	***3,16***	***3,16***
-7	*0,77*	***4,41***	***4,41***	***4,41***
-6	*0,38*	2,16	2,16	**2,16**
-5	*0,25*	1,46	1,46	1,46
-4	*0,23*	1,33	1,33	1,33
-3	*0,35*	2,03	2,03	**2,03**
-2	*0,66*	***3,76***	***3,76***	***3,76***
-1	*0,87*	***5,00***	***5,00***	***5,00***
0	*0,75*	***4,32***	***4,32***	***4,32***
1	*0,55*	***3,16***	***3,16***	***3,16***
2	*0,35*	2,00	2,00	**2,00**
3	*0,39*	2,24	**2,24**	**2,24**
4	*0,84*	***4,82***	***4,82***	***4,82***
5	*0,62*	***3,54***	***3,54***	***3,54***

The figures that are bold and underlined represent the average abnormal returns (AAR) which were found to be statistically significant.

The two sectors responded differently to the announcement of public earnings. In the Basic Materials Sector, average abnormal returns are statistically significant at a 99% confidence level for days -10;-8;-7;-2;-1;0;1;4;5. The null hypothesis A (H_o: $AAR_t = 0$) is therefore rejected on these days. When AAR is tested against a 95% confidence interval, the null hypothesis is rejected on days -10,-9,-8,-7,-2,-1,0,1,3,4,5. However, when these results were tested at a 90% interval ,the only days that did not exhibit statistically significant results were on days -5 and -4, showing a prevelence of AAR almost throughout the entire event window. This suggests that the market had a delayed response in impounding this information into stock prices as AAR was prevalent post announcement date, on days 4 and 5.

The Industrial Sector showed statistically significant average abnormal results at a 99% confidence interval on the two days following the earnings announcement (1 & 2). In addition to these two days, AAR were also seen to be statistically significant on day -9 at a 95% and 90% confidence interval. Hence, the null hypothesis A (H_o: $AAR_t = 0$) is rejected on these days.

Table 2: Average Abnormal Returns (AAR) and Z- values surrounding the announcement date of companies in the Industrial Sector.

Event Window	AAR (%)	Z-Stat (2 Tailed) Confidence Interval		
		99%	95%	90%
-10	-0,07	-0,65	-0,65	-0,65
-9	0,23	2,18	**2,18**	**2,18**
-8	-0,06	-0,58	-0,58	-0,58
-7	0,15	1,44	1,44	1,44
-6	0,01	0,10	0,10	0,10
-5	0,04	0,42	0,42	0,42
-4	0,05	0,49	0,49	0,49
-3	-0,03	-0,27	-0,27	-0,27
-2	0,07	0,63	0,63	0,63
-1	0,10%	0,98	0,98	0,98
0	0,14	1,35	1,35	1,35
1	0,29	***2,72***	***2,72***	***2,72***
2	0,28	***2,66***	***2,66***	***2,66***
3	0,10	0,92	0,92	0,92
4	0,03	0,32	0,32	0,32
5	0,12	1,09	1,09	1,09

The figures that are bold and underlined represent the average abnormal returns (AAR) which were found to be statistically significant.

In summary, the Basic Materials Sector is shown to have a higher average abnormal return than the Industrial Sector, with a significant AAR of 5% present on the day prior to the earnings announcement date. The Industrial Sector earned statistically significant returns of 2.72 % and 2.66% on day 1 & 2.

1.2 Cumulative Average Abnormal Returns (see table 3)

The analyses of the cumulative abnormal average return for the 16 day event window, shows that on a cumulative basis, any abnormal return attained is not statistically significant. This is true for both sectors under investigation in this study under the 90%; 95% as well as 99% confidence intervals. Therefore null hypothesis B is not rejected and one can assume that all sectors are efficient on the basis of a 16 day cumulative period. This finding, therefore concurs with the results of Das, Pattanayak & Pathak (2008) that indicate earnings announcements have no effect on share price. However, these results are in direct contrast to the findings of Mlonzi, Kruger, & Nthoesane (2011) who found that earnings announcements does in fact have an effect on stock prices.

The efficiency of the market should not come as a surprise, Mabhunu (2004) states that there are many reasons why the stock market is likely to be efficient. He raises two main points. Firstly, how securities markets ensure that its members receive information timeously. Mabhunu (2004) specifically makes the example relating to the massive restructuring of the JSE , which was aimed at

increasing the information flow and reducing insider trading and transaction costs. Secondly, that the securities markets are homogenous in the sense that they offer substantially the same product, the product being 'the claim to future returns subject to risk', which therefore makes them highly substitutable increasing the efficiency of the market.

Table 3: Cumulative Average Abnormal Returns (CAAR) and t/z values surrounding the announcement date of shares in there respective sectors.

Event Window	Basic Materials Sector		Industrial Sector	
	CAAR (%)	T-Stat (2 Tailed)	CAAR (%)	Z-Stat (2 Tailed)
-10	*0,68*	0,27	-0,07	-0,14
-9	*1,16*	0,33	0,16	0,23
-8	*1,71*	0,39	0,10	0,12
-7	*2,48*	0,49	0,25	0,25
-6	*2,86*	0,51	0,26	0,24
-5	*3,11*	0,50	0,31	0,25
-4	*3,34*	0,50	0,36	0,27
-3	*3,70*	0,52	0,33	0,24
-2	*4,35*	0,58	0,40	0,27
-1	*5,23*	0,66	0,50	0,32
0	*5,98*	0,72	0,64	0,39
1	*6,53*	0,75	0,93	0,54
2	*6,88*	0,76	1,21	0,68
3	*7,27*	0,77	1,30	0,71
4	*8,11*	0,83	1,34	0,70
5	*8,72*	0,87	1,45	0,74

5 Conclusion

The investigation into these two sectors of the Johannesburg Stock Exchange has shown interesting results pertaining to the efficiency of each sector. It was found that when AAR is analysed on a non- cumulative basis, investors can make abnormal returns as a result of the effect earnings announcements had on stock prices. Specifically, the Basic Materials Sector had the greatest opportunity to earn abnormal returns when compared to the Industrial Sexctors. Thus, suggesting that the Basic Material Sector was the least efficient compared to the Industrial Sector. However, these AAR were not shown to be consistent, there is not enough evidence to refute the efficient market hypothesis. When returns were measured on a cumulative basis (16 days), the abnormal returns were found to be insignificant for both sectors, thereby failing to reject null hypothesis B (H_o: $CAAR_t = 0$). These results therefore support the Efficient Market Hypothesis which states that investors are unable to outperform the market on a consistent basis.

6 Inplications and Limitations

The findings suggest that efficiency in the markets prevail and that abnormal returns were not made on a consistent basis. This information could be very useful to investors who are deciding whether to invest their money in either active or passive funds. As these findings suggest that when efficiency prevails its best to invest in passive funds.

This study only investigated whether annual public earnings announcements had an effect on share price. It excluded semi-annual or qaurterly earnings announcements, as well as any trading statements. Transaction costs were not taken into account in determing whether investors were actually able to attain those abnormal returns, without the profitability of these abnormal returns being eroded by transaction costs. The time period under investigation was limited to January to December 2012, which is a relatively short period when doing a cross sector analyses.

References

Abedini, B. (2009). Weak- Form Efficiency: Stock Market in the Gulf Co-operation Council Countries. *SCMS Journal of Indian Management*, 15-28.

Abrahamson, E., & Amir, E. (1996). The information content of the President's letter to shareholders'. *Journal of Business Finance and Accountancy*, *23(8):* 1157-1182.

Asiri, B. (2008). Testing weak-form efficiency in the Bahrain stock market. *International Journal of Emerging Markets*,*3(1):* 38-53.

Baharuddin, H. M., Ahmed, A. D., & Ying, T. C. (2010). Semi-Strong Form Efficiency:Market Reaction to Dividend and Earnings Announcements in Malaysian Stock Exchange. *The IUP Journal of Applied Finance*,*16(5)*: 36-60.

Ball, R (1994). The development, accomplishments and limitations of the theory of Stock market efficiency. *Managerial Finance*, *20*:3–48.

Ball, R., & Shivakmar, L. (2008). How Much New Information Is There in Earnings? *Journal of Accounting Research* ,*20*:975-1016.

Barker, R., & Imam, S. (2008). 'Analysts' perception of "earnings quality"', *Accounting and Business Research, 38(4):* 313–328.

Bartov, E. (1992). Patterns in unexpected unexpected earnings as an explanation for post-announcement drift. *The Accounting Review*,*75(1)*:610-622.

Bartov, E., Radhakrishnan, S., & Krinsky, I. (2000). Investor Sophistification and Patterns in Stock Returns after Earnings Announcements. *Accounting Review*,*67:* 43-63.

Bernard, V., & Thomas, J. (1989). Post earnings announcement drift: Delayed price response or risk premium, *Journal of Accounting Research, 27*: 1–36.

Bernard, V., & Thomas, J. (1990). Evidence that stock prices do not fully reflect the implications of

current earnings for future earnings. *Journal of Accounting and Economics*,*13*:305-340.

Bhana, N. (1997). Price adjustments on the JSE for announcements of share (stock) dividends. *Investments Analysts Journal, 46:* 35-44.

Bhana, N. (2003). The share price reaction to announcements of key executive dismissals by companies listed on the JSE Securities Exchange. *Investment Analysts Journal* , *58*: 29-40.

Bhana, N. (2009). The chairman's statements and annual reports: Are they reporting the same company performance to investors? *Investment Analysts Journal , 69*: 32-46.

Bhushan, R. (1994). An informational efficiency perspective on the post earnings announcement drift. *Journal of Accounting and Economics*,*18*:45-65.

Bowie, D.C. 1994. Thin Trading, Non-Normality and the Estimation of Systematic Risk on Small Stock Markets.Ph.D. Thesis. University of Cape Town.
Bruner, R. F., Eades, K. M., & Harris, R. S. (1998). Best Practices in Estimating the Cost of Capital: Survey and Synthesis. *Financial Practice and Education* , 13-28.

Chatuverdi, H.O. (2000). Empirical anomalies based on unexpected earnings: The Indian experience, *ICFAI University Journal of Accounting Research, I(1):* 1–13.

Chordia, T., Goyal, A., Sadka, G., Sadka, R., & Shivakumar, L. (2009). Liquidity and the Post-Earnings Announcement Drift. *Financial Analysts Journal* , *65(4):* 18-32.

Chordia, T. & Shivakumar, L. (2005).Inflation illusion and post-earnings announcement drift, *Journal of Accounting Research, 43(4)*: 521–556.

Cready, W.M. & Gurun, U.G. (2010).Aggregate market reaction to earnings Announcements, *Journal of Accounting Research, 48(2):* 289–334.

Das, S., Pattanayak, J.K. & Pathak, P. (2008). 'The effect of quarterly earnings announcement on Sensex: A case with clustering of events, *ICFAI University Journal of Accountin Research, 7(4):* 64–78.

Elliot, W. (2006). Are investors influenced by pro forma emphasis and reconciliations in the earnings announcements? *The Accounting review , 81(1):* 113-133.

Fama, E. (1970). Efficient capital markets: A review of theory and emperical work. *Journal of Finance*, *25:* 383-417.

Fama, E. F., & French K. R. (2008). Dissecting Anomalies. *The Journal of Finance, 63(4):*1653-1678.

Freeman, R., & Tse, S. (1989). The multiperiod information contentof accounting earnings: Confirmations and contradictions of previous earnings reports. *Journal of Accounting Research* ,*27:* 49-79.

Hoffman, A. (2012). Stock return anomolies: Evidence from the Johannesburg Stock Exchange. *Investment Analysts Journal*,*75*:21-41.

Isa, M., & Subramaniam, V. (1992),The Effects of Dividend and Earnings Announcement on Stock Prices in the Malaysian Stock Market, *Malaysian Journal of Economic Studies*, *29(1):*35-49.

Jagric, T., Podobnik, B., & Kolanovic, M. (2005). Does the Efficient Market Hypothesis Hold? *Eastern European Economics*,*43(4):* 79-103.

Louhichi, W. (2008).Adjustment of stock prices to earnings announcement: Evidence from Euronext Paris, *Review of Accounting Finance, 7(1):* 102–115.

Mabhunu, M. 2004. The market efficiency hypothesis and the behaviour of stock returns on the JSE. .Ph.D.Thesis. Rhodes University.

Maguire, W. (1997). Voluntary reporting of financial targets: Motivation and share price reaction . *SA Journal of Accounting Research , 11(1):* 15-38.

Malkiel, B. G. (2003). The Efficient Market Hypothesis and Its Critics. *Journal of Economic Perspectives*,*17(1)*: 59-82.

Malkiel, B. G. (2005). Reflections on the Efficient Market Hypothesis: 30 Years Later. *The financial Review*, 1-9.

Miles, M., & Me Cue, T. (1982). Historic Returns and Institutional Real Estate Portfolios. *AREUEA Journal*, 184-198.

Mlonzi, V., Kruger, J., & Nthoesane, M. (2011). Share price reaction to earnings announcement on the JSE-ALtX: A test for market efficiency. *Southern African Business Review*,*15(3):*142-166.

Nichols, NA (1993). Efficient? chaotic? What's the new finance? *Harvard Business Review*, *71*: 50–56.

Salamon, G. L., & Stober, T. L. (1994). Cross-Quarter Differences in Stock Price Responses to Earnings Announcements: Fourth-Quarter and Seasonality Influences. *Contemporary Accounting Research*,*11(1):*297-330.

Shleifer, A. (2000). *Inefficient Markets: An Introduction to Behavioral Finance.* New York: Oxford University Press.

Taylor, S. (1982). Tests of the random walk hypothesis against a price trend hypothesis. *Journal of Financial and Qauntitative Analysis*, *17*: 37-61.

Thaler, R.H.(1993). *Advances in Behavioral Finance*. New York, NY: Russell Sage Foundation.