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**Newspaper headlines as contrarian indicators of share price
performance for companies listed on the Johannesburg Stock
Exchange**

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Abstract

Much has been written, by academics, about media coverage as being contrarian indicators i.e. media headlines have an impact on the share price performance of featured companies.

The objective of this study was to investigate if this phenomenon was true for listed South African Companies. Thus the study determined if newspapers were effective contrarian indicators for companies listed in the Johannesburg Stock Exchange (JSE). This determination was through a recognised research method and statistical analysis. The study analysed 257 Business Day headlines, featuring JSE listed companies. The study then assessed share price performance for the period 120 days before and 120 days after the headline announcement.

The study found that press announcements do have an impact on the share price performance of JSE listed companies and that the impact was significantly higher than those reported in the developed capital markets. The study further determined that positive headlines lead to positive company share price performance; and that negative headlines do not necessary lead to a negative share price performance. The study also found that the impact of these press announcements is influenced by the company's market capitalisation and sector. It was shown that companies with a large market capitalisation experienced significant impact on share price performance compared to companies with a small market capitalisation.



Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination at any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Andisa H.A. Ramavhunga

Date



Acknowledgement

I would like to dedicate this research to my late father, Jackson Mokona Ramavhunga. Your spirit still lives within us and we will forever remember and honour you.

To my mother, you have always instilled in us the values of education and hard work. I owe you a huge debt of gratitude for your commitment and sacrifice to improve the lives of your children. This is very much your achievement as well.

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Table of Contents

CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM.....	1
1.1 Introduction	1
1.2 Problem statement	4
1.3 Purpose of research	5
1.4 Structure of the research report.....	7
CHAPTER 2: LITERATURE REVIEW.....	9
2.1 Introduction	9
2.2 Cover page stories as Contrarian Indicators	9
2.3 Event study methodology	10
2.4 Impact of sport sponsorship announcements on stock prices	11
2.5 Impact of M&A and strategic alliance announcements on stock prices	12
2.6 Impact of macro-economic policy decision announcements on stock prices.....	15
2.7 Impact of capital Investments and dividend decisions announcements on stock prices	18
2.8 Impact of Share buyback decisions announcements on stock prices.....	20
2.9 Impact of strategic decisions announcements on stock prices	21
2.10 Impact of social decisions announcements on stock prices.....	22
2.11 Stock price reaction to natural disasters	24
2.12 Stock price reaction to Human Resource announcements	24



CHAPTER 3: RESEARCH HYPOTHESES.....26

3.1 Introduction 26

3.2 Hypotheses 26

CHAPTER 4: RESEARCH METHODOLOGY29

4.1 Introduction 29

4.2 Rationale for Methodology 29

4.3 Data collection process 31

4.3.1 Business day article data collection process 31

4.3.2 Feature story classification 31

4.3.3 Market share price data collection process 33

4.4 Unit of analysis, Population and sample design 34

4.5 Limitations of the sample design 34

4.6 Data analysis methods 35

4.6.1 Describing and understanding the data 35

4.6.2 Overview of hypothesis testing 36

4.6.3 Testing Hypothesis 1 36

4.6.4 Testing Hypothesis 2 37

4.6.5 Testing Hypothesis 3 37

4.6.6 Testing Hypothesis 4 37



CHAPTER 5: RESULTS.....39

5.1 Introduction 39

5.2 Descriptive statistics for the data..... 39

5.3 Descriptive statistics for market capitalisation 40

5.4 Market Capitalisation skeweness 41

5.5 Descriptive statistics for share price movement 42

5.6 Plot analysis of the data 44

5.7 Hypothesis 1 49

5.8 Hypothesis 2 51

 5.8.1 Overall correlation test 52

 5.8.2 Detailed headline category test..... 53

5.9 Hypothesis 3 54

5.10 Hypothesis 4 56

 5.10.1 Anova test results 120 days before and after the press announcements 57

 5.10.2 Anova test results 90 days before and after the press announcements 58

 5.10.3 Anova test results 60 days before and after the press announcements 59

 5.10.4 Anova test results 30 days before and after the press announcements 60

 5.10.5 Anova test results 60 days before and after the press announcements 61

 5.10.6 Anova Test Conclusions 61

CHAPTER 6: DISCUSSION OF RESULTS62

6.1 Introduction 62

6.2 Hypothesis 1 62



6.3	Hypothesis 2	64
6.4	Hypothesis 3	68
6.5	Hypothesis 4	69
6.6	Average Returns Observed	70
6.7	Conclusion	71
CHAPTER 7: CONCLUSION		73
7.1	Introduction	73
7.2	Summary of key findings	73
7.3	Recommendations to main stakeholders	74
7.3.1	Investors	74
7.3.2	Companies featured in headlines	75
7.4	Ideas for future research	75
7.4.1	Improved dataset	75
7.4.2	Research using other publications	76
7.4.3	Utilisation of the event study methodology	76
7.5	Conclusion	76
8 REFERENCES		78
9 APPENDIX A – STATISTICAL ANALYSIS OUTPUTS		86
9.1	Share Price Movement Plots	86
9.2	Strata outputs	92
9.2.1	<i>Hypothesis 1:</i>	92
9.2.2	<i>Hypothesis 2:</i>	95



9.2.3	<i>Hypothesis 3:</i>	113
9.2.4	<i>Hypothesis 4:</i>	118
10	APPENDIX B – BUSINESS DAY NEWSPAPER	122



Table of Figures

FIGURE 5.4-1: MARKET CAPITALISATION HISTOGRAM	41
FIGURE 5.6-1: PLOT FOR 120 DAYS BEFORE AND 120 DAY AFTER THE ANNOUNCEMENT	45
FIGURE 5.6-2: PLOT FOR 90 DAYS BEFORE AND AFTER THE ANNOUNCEMENT	45
FIGURE 5.6-3: PLOT FOR 60 DAYS BEFORE AND 60 DAY AFTER THE ANNOUNCEMENT	46
FIGURE 5.6-4: PLOT FOR 30 DAYS BEFORE AND 30 DAYS AFTER THE ANNOUNCEMENT	47
FIGURE 5.6-5: PLOT FOR 5 DAYS BEFORE AND 5 DAYS AFTER THE ANNOUNCEMENT	48

Table of Tables

TABLE 5.2-1: DESCRIPTIVE STATISTICS FOR FEATURE STORIES	39
TABLE 5.3-1: DESCRIPTIVE STATISTICS FOR MARKET CAPITALISATION	40
TABLE 5.5-1: DESCRIPTIVE STATISTICS FOR SHARE PRICE MOVEMENTS - MEANS (SD)	43
TABLE 5.7-1: MEAN (SD) OF SHARE PERFORMANCE	49
TABLE 5.7-2: P-VALUES FOR THE STATISTICAL TEST FOR DIFFERENCE BEFORE AND AFTER ANNOUNCEMENT	50
TABLE 5.8-1: CORRELATION BETWEEN HEADLINE CATEGORIZATION AND SHARE PERFORMANCE: CORRELATION (P-VALUE)	52
TABLE 5.8-2: P-VALUES FOR BEFORE-AFTER DIFFERENCES PER HEADLINE CATEGORY	54
TABLE 5.9-1: MATCHED-PAIRS T-TESTS P-VALUES FOR BEFORE-AND-AFTER PERFORMANCE FOR MARKET CAP CATEGORIES	55
TABLE 6.6-1: AVERAGE RETURNS CALCULATION	70



Chapter 1: Introduction to the Research Problem

1.1 Introduction

According to the Johannesburg Stock Exchange (JSE) (2009), the JSE is the 14th largest stock exchange in the world. It manages over R2.3 trillion (\$370 billion) worth of shares and has over 400 listed companies (Johannesburg Stock Exchange, 2009). The JSE provides companies with the opportunity to raise capital in a highly regulated environment through its markets i.e. the Main Board and the Alternative Exchange (Johannesburg Stock Exchange, 2009).

The JSE provides a service to both local and international investors who seek to gain exposure to the capital markets in South Africa. The JSE also serves as a gateway to the broader African continent. Some of the global companies listed on the JSE include Anglo American PLC, SABMiller, MTN, BHP Billiton PLC, British American Tobacco PLC and Standard Bank group e.t.c.

There is much reported in the media (i.e. daily and weekly newspapers, weekly business magazines, television and radio) on business activities of these 400 listed companies. The newspaper circulation alone has a great penetration in South Africa.

According to the International Marketing Council of South Africa (2009), South Africa has 20 daily and 13 weekly newspapers. Most of these publications are in English and cover general, business and sports news. 14.5-million South



Africans buy the urban daily newspapers, while community newspapers have a circulation of 5.5-million. There is a range of general and specialised news websites which, in terms of the speed and breadth of their coverage, are on a par with the best in the world (International Marketing Council of South Africa, 2009).

Conducting a desktop research on the impact the media coverage has on JSE listed companies yields very little results. This indicates that academics and the business world have very little insight or empirical evidence on the link or impact between media coverage and share price performance of a JSE listed company that is featured in the coverage.

Some of the popular business publications such as the Business Day, Finweek and Financial Mail are dedicated entirely to stories of companies and company performances. There are also South African television and radio shows that are dedicated to business and company stories e.g. Summit TV and Moneyweb.

This paper aims to establish a link (and assess the impact) between stories in leading publications and share price performance on the Johannesburg stock exchange. While such research has been conducted in other countries, primarily in the US and Europe, we know of no prior research of this sort for South Africa and the JSE in particular.



Numerous authors, both academic and business, have written a great deal about newspapers and covers of business magazines as being contrarian signals. Arnold, Earl and North (2007) found a link between cover page stories in leading American business magazines (Business week, Fortune and Forbes) and a company's future stock performance.

Desai and Jain (2004); Ferreira and Smith (2003) studied the impact of television programs on company's stock performance. Chordia, Roll, and Subrahmanyam (2002) studied the importance of contrarianism in financial market trading.

To formalise how a newspaper cover page might affect future returns of the featured company, Desai and Jain (2004) suggests that an assumption should be made that the given feature story reports new pertinent information on the company or simply reports past information. This paper endorsed these set of assumptions.

Desai and Jain (2004) proceeded to suggest that if the information is genuinely new, the market can show the following reactions:

- An instantaneous and correct reaction — that is, a very short term effect occurs but no lingering future effects;
- An under-reaction — a potentially longer-term effect occurs that makes the story a momentum indicator;
- An overreaction — a potentially longer-term effect occurs that makes the story a contrarian indicator.



If the information contained in the newspaper feature story is not new, the market can have the following reactions:-

- No reaction—that is, all information incorporated in prices;
- A reaction that coincides with the popularity of the stock — that is, a possible momentum indicator;
- A reaction that coincides with the stock being mispriced — that is, a possible contrarian indicator.

Most of the anecdotal evidence, suggested Desai and Jain (2004), supports the notion that cover stories are not informational due to the time required by journalists to gather information for the article and to print it (Desai and Jain, 2004). These requirements cause a delay in the dissemination of news by the print media.

It is worth a mention that the availability of instantaneous business news such as sens announcements, internet and mobile business news feeds places daily and weekly news at a disadvantage. The disadvantage is greatly increased for biweekly (every two weeks) news and magazines (Desai and Jain, 2004).

1.2 Problem statement

The aim of this research was to establish if there is a link between cover page stories in leading South African business publications (particularly newspapers) and share price performance of JSE listed companies, which are



a feature of the cover page story. Stated differently, the paper aimed to establish if newspaper coverage has an impact on share price performance of JSE listed company.

The paper also assessed if positive newspaper headlines led to positive share price performance (and alternatively assessed if negative newspaper headlines led to negative share price performance). The paper also attempted to establish if there are other factors that influence the impact of the headlines. Such factors include market capitalisation of the company and the JSE sector that the company belongs to.

In this paper, headlines, press announcements, coverage all refer to newspaper articles that feature a listed JSE company.

1.3 Purpose of research

In light of the value of the stock managed by the Johannesburg Stock Exchange (the JSE market capitalisation during March 2009 was estimated at R2.3 trillion), it becomes necessary to estimate the impact that the media coverage has on the performance of share prices of featured companies. The share price determines the market capitalisation of companies and stock exchanges.



A company's (or a stock exchange for that matter) market capitalisation is defined as the price of a share multiplied by the number of shares issued by the company.

The objective of the research is to establish if media announcement, particularly newspaper cover page stories, have an impact on the share price of the features company. Other objectives are to establish if:-

- Negative publicity leads to negative share price performance (or conversely positive publicity leads to a positive share price performance)
- The impact differs by the size of the company in terms of market capitalisation or sector that the company belongs to.

Over and above the academic interest, the insights resulting from such a research are also important for investment decision making by companies (i.e. share buybacks or share sale decisions), institutional investors and individual investors.

Such insights are certainly valuable for individual investors who will be interested to know what impact certain media announcements have on the price for a share they hold in their portfolio. This knowledge is essential in order to assess and understand the potential impact the various press announcements might have on the value of the equity of a listed company.



1.4 Structure of the research report

The document will continue by discussing, in Chapter 2, the relevant theory and prevailing understanding on the impact of media coverage on share price performance of featured companies. We also examine leading methods used to determine the impact of press announcements on stock performance of featured companies.

Chapter 3 articulates the hypothesis that the research aims to test. These hypotheses are based on the literature review conducted in chapter 2. A set of hypotheses are developed which are tested to prove or disprove the theory from the literature review.

Chapter 4 provides details regarding the methodology that was used to test the set of hypotheses described in chapter 3. This chapter defines the unit of analysis, describes the data identification (i.e. population and sample size) and selection process (sampling methods) and provides details of the statistical techniques that are used to analyse the data.

In chapter 5, the research results are consolidated and presented. The presentation includes descriptive and analytical results from the statistical analysis. In chapter 6 the results are interpreted and discussed, highlighting concerns that we found.

Chapter 7 highlights the major findings of the research and draws insights and implications based on the results. This chapter includes a set of



recommendations for the various stakeholders (companies featured in the newspaper articles, institutional and individual investors). The possible future research is also highlighted.



Chapter 2: Literature review

2.1 Introduction

As mentioned in chapter 1, a number of studies have been conducted to prove or disprove media publications' impact on companies' share price performance. In this chapter the latest literature on the field was reviewed. Major themes were group together to attempt to generate understanding and insights from the theory presented. Some of the popular methods that are used to assess the impact of media coverage on a share price performance are discussed.

2.2 Cover page stories as Contrarian Indicators

Arnold et al (2007) found that positive cover page stories can be correlated to positive stock performance. The same argument holds true for negative performance and negative stock performance. Arnold et al. (2007) analysed companies that were subject of feature stories in the Business week, Fortune and Forbes magazines during the period between 1983 and 2002. 549 feature stories were analysed. They found a link between positive cover page stories and positive stock performance. The reverse situation was also found to be true.

Desai and Jain (2004) examined 1 to 3 years performance of common stocks following 5,596 stock split and 76 reverse split announcements made during the period between 1976 and 1991. Their results suggested that markets often under react to both the stock split and the reverse split announcements.



They also found that the announcement period and the long - run abnormal returns are both positively associated with an increase in dividends (Desai and Jain, 2004)

Ferreira and Smith (2003) conducted a study to determine the impact of recommendations made by panellists during a television show called **"Wall Street Week with Louis Rukeyser"** in 1997. They found that the portfolio of stocks under investigation improved in value in the following eight quarters.

Furthermore they also found that the increase in value was higher than for the matched sample in all eight quarters. They found the results to be similar when categorised by industry, size, and book-to-market value of the companies under investigation.

2.3 Event study methodology

Other methodologies have been utilised to determine the impact of press announcements on stock performance of companies. The event study methodology has been used in numerous disciplines to examine security price behaviour around events.

The events of interests for this methodology are financial and economic events such as accounting rule changes, earnings announcements, and changes in the severity of regulation and money supply announcements (Binder, 1998).



Vergos, Christopoulos and Melonakos (2008) investigated the effects of political, economic, investment, and analysts report announcements on the share price of the Hellenic Telecommunication Organisation (HTO).

The announcements investigated related to HTO's management status (e.g. government decisions about privatisation), investments in subsidiaries, competitive strategy, capital structure decisions and profit announcements.

They found that stock prices do not react instantaneously to publicly announced information and that stock prices continue to appreciate or depreciate until at least ten days after the announcements (Vergos et al, 2008).

Papasyriopoulos, Koulakiotis, Papadimitriou and Kalimeris (2007), used the event study methodology to study six Greek industrial and construction firms. The study was done in an attempt to measure the abnormal returns on stock prices on the day of the acquisition announcement. Their results showed that good news have a positive effect on abnormal returns, while bad news a marginal negative ones (Papasyriopoulos et al., 2007).

2.4 Impact of sport sponsorship announcements on stock prices

Spais and Filis (2008) conducted a test to determine the major beneficiary in a sponsorship agreement deal (is the major beneficiary the sponsor or the sponsored organisation?). Their paper dealt with the stock market reaction to

official football club sponsorship announcements, particularly that of Juventus Football club by FIAT.

The agreement was worth 33 million Euros. Both organisations were listed in the Italian stock exchange. The event-study methodology was used to test 123 daily stock prices. They found that the announcement had a greater impact on Juventus' stock than on Fiat's. They found that the impact on Juventus' stock was negative, whereas the impact on Fiat's stock was positive (Spais and Filis, 2008)

Pruitt, Cornwell and Clarke (2004) conducted a research to determine the impact of NASCAR sponsorship announcements on the stock prices of sponsoring firms. Their research found that the NASCAR sponsorship announcements were led to the largest increases in shareholder wealth ever recorded in the marketing literature.

They analysed 24 sponsoring organisations in their study and these sponsors experienced a mean increase in shareholder wealth of over \$300 million dollars, after deducting all of the costs associated with the sponsorships. Pruitt et al (2004) used a multiple regression analysis of firm-specific stock price.

2.5 Impact of M&A and strategic alliance announcements on stock prices

Rosen (2006) examines the effects of mergers on bidding firms' stock prices. He found evidence that the bidder's stock prices are more likely to increase



when a merger is announced, if recent mergers by other firms have been well received by the market or if the overall stock market is doing well.

However, Rosen (2006) found that, in the long run, the bidders' stock returns are lower for mergers announced when either the stock markets were favourable at the time of the merger than for those announced at other times (Rosen, 2006).

Liang, Yao and Lin (2005) used an event method and developed a model to measure the indirect impact on the stock prices of investing companies engaging in strategic alliances with Taiwan's high-tech industry from 1998 to 2002. They also discuss the market's different responses in their stock prices according to various industrial types that have been used to classify these investing companies (Liang et al, 2005).

Liang et al (2005) found that for the sample of all Taiwan's TSEC- and OTC-listed investing companies in strategic alliances, the markets responded positively in the stock prices of the investing companies. They also found that the investing companies benefited from the optimistic news of strategic alliances, and this caused their stock prices to generate abnormal returns (Liang et al, 2005).

Karceski, Ongena and Smith (2005) estimated the impact of bank merger announcements on borrowers' stock prices for publicly listed Norwegian companies. They found that borrowers of target banks lose about 0.8% in equity value, while borrowers of acquiring banks earn positive abnormal



returns. This suggests that the borrower welfare is influenced by a strategic focus favouring acquiring borrowers (Karceski et al, 2005).

Karceski et al (2005) further found that bank mergers lead to higher relationship exit rates among borrowers of target banks and larger merger-induced increases in relationship termination rates are associated with less negative abnormal returns, suggesting that firms with low switching costs switch banks, while similar firms with high switching costs are locked into their current relationship (Karceski et al, 2005).

Diepold, Feinberg, Round and Tustin (2008) investigated 50 mergers and acquisitions transaction involving Australian companies from 1996 to 2003. They examined the impact on share prices of the announcement of these mergers both on the firms involved and on rival firms.

For the transactions which were challenged by the Australian antitrust enforcers, they further considered the impact of the announcement of such a challenge (Diepold et al, 2008).

Their results indicate that there is a significant abnormal return to announcements for target companies, for those announcements that had limited impact of Australian Competition and Consumer Commission (ACCC) involvement (Diepold et al, 2008).



They also found no impact on the target firms' returns and that actions or expected actions from the ACCC does indicate to have some impact on acquiring firms' investors' responses to domestic mergers. Significantly lower abnormal returns were found for acquirers in mergers that were raised with the ACCC (Diepold et al, 2008).

Their findings indicate that there is strong evidence that cross-border impact on share-price seem to be less favourable compared to domestic mergers. There is insufficient evidence that the ACCC has much influence on investors' reactions to these mergers (Diepold et al, 2008).

2.6 Impact of macro-economic policy decision announcements on stock prices

Adams, McQueen and Wood (2004) investigated the response of stock price to news of inflation. Other objective of their research was to establish the speed of the response in question and the impact of economic stability on the response. They explored the relationship by examining the response (in minutes and trades) of size-based stock portfolios to unexpected changes in the Producer Price Index and Consumer Price Index announcements.

Adams et al (2004) found that news about inflation does have an impact on stock returns and that stocks tend to respond to inflation news in about 10–20 minutes. Finally they found that stock-inflation relationship is state dependent i.e. the relationship varies with the economy.

Serwa (2006) found evidence on the short-run reactions of an emerging financial market to monetary policy announcements. He used the 'identification through heteroscedasticity' technique to estimate the impact of a change in the official interest rate in Poland.

In his analysis he found that the short-term interest rates respond significantly to official interest rate changes, but the long-term interest rates, stock indices and foreign exchange rates reacted to monetary announcements in the expected direction.

Poitras (2004) estimated the impact of macro economic variables (such as employment and inflation) announcement by federal bureaus on stock prices. His analysis estimated the impact of several macro economic factors on daily closing values of Standard and Poor (S&P) 500 companies.

Poetries' study was able to establish a relationship between that announcement of the macro economic factors and stock prices but in contradiction to Adams et al (2004), he did not find evidence that the impact varied with the state of the economy.

Haw, Park, Qi and Wu (2006) used a sample of earnings announcements of Chinese firms in the fiscal years 1994–1999 (covering the periods before and after the introduction of a regulation to stagger the release of annual reports) to assess the relation between earnings news and the timing of earnings announcements.



They found that even though the reporting lag has been significantly reduced as a result of the regulation, the trend whereby good news is announced earlier than bad news persists. They then examined the behaviour of stock prices before earnings announcements and find some indication of information leakage.

Their findings suggest that the regulation had the expected effect of reducing reporting delay and earnings release clustering (Haw et al, 2006). The regulation did not seem to reduce the extent of the preannouncement leakage of information (Haw et al, 2006).

Bredin, Gavin and O'Reilly (2005) investigated the influence of foreign monetary policy decisions on the volatility of the Irish stock market. They particularly focussed on the influence of US monetary policy announcements on the ISEQ (Irish Stock Exchange). They found that there is a decline in volatility on the day prior to a Federal Open Market Committee (FOMC) meeting and a subsequent increase in volatility after the results of the FOMC meeting is made known.

They also found evidence that ISEQ volatility is influenced by surprise changes in US monetary policy. Furthermore, US monetary surprises seem to affect Irish stock return volatility asymmetrically with a surprise tightening of US monetary policy leading to an increase in Irish stock return volatility (Bredin et al, 2005).



Guidi, Russell and Alexander (2006) wrote a paper on the effects of OPEC policy decisions on the US and UK stock markets. They also researched the effects on oil prices. Their research focused on the periods of conflict and non-conflict from 1986 to 2004.

Their key findings are that there are “asymmetric” reactions to OPEC (Organisation of the Petroleum Exporting Countries) policy decisions during periods of conflict for the US and UK stock markets. They also found that, during conflict periods, oil markets require time to incorporate OPEC decisions. Conversely, in non-conflict periods their results suggest that the oil markets incorporate OPEC decisions efficiently (Guide et al, 2006).

Guidi et al (2006) used an event study methodology to examine stock returns and oil prices for five days before and five days after the announcement of an OPEC policy decision. Overall they concluded that overall, despite the media attention which is drawn to the OPEC Conference, the decisions of OPEC does not destabilise both the oil spot markets and the US and UK stock markets (Guidi et al, 2006).

2.7 Impact of capital Investments and dividend decisions announcements on stock prices

Jones, Danbolt and Hirst (2004) used the event study method to examine the stock market reaction of 402 company investment announcements made by UK companies during the period between 1991 and 1996. They found that the abnormal returns are generally positive but small.



They further classified investment announcements according to functional categories, and they found that the level of abnormal returns vary according to the type of capital investment being announced.

In particular, they found that markets reacted favourably to investments that create future investment opportunities, than investments that do not. Jones et al (2004) also found that the market reaction also varied with firm size. Large companies experienced smaller responses to announcements than smaller firms.

A study to tests the signalling theory of dividends by investigating the stock price reaction to dividend announcements on the Oslo Stock Exchange (OSE) was conducted by Capstaff, Klæboe and Marshall (2004). Their results show that significant abnormal stock returns are associated with announcements of dividend changes. Their results further revealed that the stock market reaction is more pronounced for large, positive dividend announcements (Capstaff et al, 2004).

Collet (2004) examined the reactions of the London Stock Exchange stock prices to company trading statement announcements. He found that negative trading statements outnumber positive trading statements by 50%, and, that market reaction, measured by abnormal returns, is considerably greater for the negative statements (Collet, 2004).



2.8 Impact of Share buyback decisions announcements on stock prices

Hyderabad (2009) studied 68 buyback announcements in India. His study calculated event returns over numerous window periods. His analysis shows that average abnormal returns (AAR) on the date of announcement of a share buy back are 2.83 percent, while cumulative abnormal returns (CAR) are about 6 percent on the announcement date with an overall CAR 5.16 percent for 41-day event window.

Hyderabad (2009) concluded that the market reactions in India are relatively higher than what the studies in the US and the UK found. He further interpreted that as indicating that Indian capital markets are more undervalued and that a greater degree of information asymmetry exists in the Indian market (Hyderabad, 2009).

Brown (2007) investigated the price and volume behaviour around the announcement of a type of off-market repurchases (she refers to as “equal access repurchases”) for Australian companies. She found that Australian companies had smaller but significant abnormal returns (around 1.2%), on the announcement date, compared to studies in the US which found abnormal returns of around 8% for off-market repurchase (Brown, 2007).

She interpreted this evidence as suggesting that the abnormal returns are related to the discount-to-market price at which the offer is made (which is also a function of special taxation arrangements) (Brown, 2007). She also



found a significant increase in trading volumes on the day of the announcement and subsequent day. She argues that this trading may be driven by the levels of tax benefits that are passed on to the shareholders that are taking part in the transaction.

2.9 Impact of strategic decisions announcements on stock prices

The study by Jones and Danbolt (2005) examined the level of abnormal returns arising when a company announces projects that result in product or market diversification. They found that the announcement of product and market diversification projects lead to significant abnormal returns of 1.1% (Jones and Danbolt, 2005).

They also found however, that the gains are higher for new products than for new markets, and for companies with high price-earnings ratios and low (or zero) dividend yields (Jones and Danbolt, 2005).

Frino, Jones and Wong (2007) conducted a study to determine market behaviour around bankruptcy announcements of companies listed in the Australian Stock Exchange. Their results reveal that investors in failed firms typically incur substantial negative stock returns leading up to failure announcements but they do not find evidence of an announcement effect (i.e. negative stock returns on the event day itself or the day preceding).

Goins and Gruca (2008) examined how reputational changes in the announcing company affect the reputations of its competitors, through



changes in their stock prices, in the same (contagion effect) or opposite (competitive effect) direction. Goins and Gruca (2008) studied layoff announcements in the US oil and gas industry from 1989 to 1996.

The results of their study suggest that reputation effects of layoff announcements extend beyond the announcing company and extend to other companies in the industry (Goins and Gruca, 2008).

Ursel and Armstrong-Stassen (2005) analysed the impact on stock prices, and thus on stockholders, of 84 newspaper announcements regarding corporate age discrimination lawsuits. They found that, on average, initial announcements led to a 2 percent decline in stock price, a \$40 million average loss in total stock value for the large firms charged (Ursel and Armstrong-Stassen, 2005).

They further found that the stock price decreases are consistent with investor concerns about the firms' ability to attract and retain good employees given the discrimination charges (Ursel and Armstrong-Stassen, 2005)

2.10 Impact of social decisions announcements on stock prices

Cook and Glass (2008) analysed the appointment of black leaders to top corporate positions and the reaction of the stock price of the company that appointed them; and they compared that to the appointment of white leaders. They analysed 93 black executive appointments announcements and 350 white executive appointment announcements (Cook and Glass, 2008).



Their key findings were that the appointment of black leaders has a significantly negative impact on stock prices in comparison to the appointment of white leaders to comparable positions for a period of 10 days following the announcement (Cook and Glass, 2008).

Cook and Glass (2008) further found that that markets assess black leaders appointed from outside the company more positively than black leaders who were promoted from within.

Cook and Glass (2009) conducted a further, similar, study to examine the impact that the appointment of racial or ethnic minorities into top management positions has on a share price of a company; and they contrasted that to the appointment of members of the racial or ethnic majority into equivalent positions.

Cook and Glass (2009) used the event study methodology to examine 128 racial and ethnic minority males' appointment announcements and 345 ethnic majority males' appointment announcements in the US.

They found that the market reaction to the appointment of minorities into corporate leadership positions is significant and negative while the market's reaction to the appointment of members of the racial/ethnic majority is significant and positive (Cook and Glass, 2009).



Cook and Glass's (2009) findings suggest that racial/ethnic integration in corporate hierarchies is impeded as result of investors' reaction increasingly drives company-level governance decisions.

2.11 Stock price reaction to natural disasters

A research that uses an event study methodology to examine the effect of Hurricane Floyd and the associated scientific and media releases on the market value of insurance firms was concluded by Ewing, Hein and Kruse (2006). Their research tracked information describing the development of the storm over time and space and used it to determine the reaction of the financial markets as news about the storm's characteristics changed.

Ewing et al (2006) key findings were that, overall there was a negative effect on insurer stock price changes around the life cycle of the storm; they also found, however, that this effect was neither constant nor was it always negative on each day of the cycle.

2.12 Stock price reaction to Human Resource announcements

Arthur and Cook (2004) examined share price reactions to 231 work-family human resource policies adopted by Fortune 500 companies. They studied announcements in the Wall Street Journal between 1971 and 1996 (Arthur and Cook, 2004).



Their results indicate that company announcements of work-family initiatives affect the shareholder return positively. They test, empirically, three hypotheses concerning how the timing of work-family initiatives influences shareholder response.

They found that a company that is the leader in announcing the first-ever implementation of a work-family initiative was seen to realise a larger share price increase on the announcement day compared to companies that adopt such schemes later (Arthur and Cook, 2004).



Chapter 3: Research Hypotheses

3.1 Introduction

The objective of the study was to determine if there is a link between press announcements in leading South African business publication and share price performance of the featured, Johannesburg Stock Exchange listed, company.

This chapter develops and articulates the hypotheses that the research aims to test. These hypotheses are based on the literature review conducted in chapter 2.

3.2 Hypotheses

There are four hypotheses that were tested. For each hypothesis a null (H_0) and an alternative (H_1) hypothesis are stated. The hypotheses are thus defined as follows:-

- **Hypothesis 1:** There is a link between press announcements and share price performance.

H_0 : There is a link between press announcement and share price performance i.e. $\mu_{+1} \neq \mu_{-1}$ where μ_{+1} is the mean of the share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement.

H_1 : There is no link between press announcement and share price performance. i.e. $\mu_{+1} \approx \mu_{-1}$ where μ_{+1} is the mean of the



share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement.

- **Hypothesis 2:** There is a positive relationship between a positive headline and share price performance (the converse holds that there is a negative relationship between a negative headline and share price performance).

H_0 : There is a positive relationship between a positive headline and share price performance i.e. $\mu_{+1} > \mu_{-1}$ where μ_{+1} is the mean of the share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement.

H_1 : There is a negative or no relationship between a positive headline category and share price performance i.e. $\mu_{+1} \leq \mu_{-1}$ or $\mu_{+1} \approx \mu_{-1}$ where μ_{+1} is the mean of the share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement.

- **Hypothesis 3:** The impact of an announcement on a share price performance depends on the market capitalisation of the company

H_0 : The impact of an announcement on a share price performance depends on the market capitalisation of the company



H_1 : The impact of a press announcement on share price performance **does not** depend on the market capitalisation of the company

- **Hypothesis 4:** The impact of an announcement on share price performance depends on the JSE sector the company is in.

H_0 : The impact of an announcement on share price performance depends on the JSE sector the company is in.

H_1 : The impact of an announcement on share price performance **does not** depend on the JSE sector the company is in



Chapter 4: Research Methodology

4.1 Introduction

This chapter provides a detailed methodology that was used to test the set of hypotheses described in chapter 3. This chapter defines the unit of analysis, describes the data identification (i.e. population and sample size) and selection process (sampling methods) and the provide details of the statistical techniques that is used to analyse the data.

4.2 Rationale for Methodology

This research concerns itself with evaluating share price performance of JSE listed companies which are subjects of newspapers' front page stories. The share price performance is analysed as a result of some event. This naturally requires a study of historical events i.e. contents of a newspaper front page story at a particular date, share price performance prior and post the date of the newspaper front page story.

This chapter provides a detailed methodology that is used to test the set of hypotheses described in chapter 3. This chapter defines the unit of analysis, describes the data identification (i.e. population and sample size) and selection process (sampling methods) and the provide details of the statistical techniques that is used to analyse the data.



The research, therefore, warrants the use of a research method known as **secondary data analysis**. Zikmund (2003) defines secondary data as follows:

“Data that have been previously collected for some purpose other than the one at hand”

The research conducted a quantitative analysis of previously collected data that was publicly available i.e. archived newspaper articles and market share data. The newspaper that was used for the research was the ***Business Day***. Historical share price movements were obtained from a database known as ***McGregor BFA***.

The Business Day is South Africa’s leading publication of business news. The newspaper is published daily between Monday and Friday, by BDFM Publishers (Pty) Ltd. BDFM is also a publisher of Financial Mail, The Weekender and Bignews, and is owned by Avusa Limited.

McGregor BFA is an online provider of stock market, basic research data and news to South Africa’s financial sector and the corporate market. Market share price data is made available via a web based user interface.



4.3 Data collection process

4.3.1 Business day article data collection process

Copies of the Business Day newspaper articles were collected from their archives in their head office. The newspaper articles were collected for the period 2002 and 2007. The 2008 period was purposefully left out due to the volatility in the South African stock exchange as a result of the recessionary economic environment.

A total of 257 Business Day newspaper articles were collected covering companies in period between 2002 and 2007. There are two main reasons for the low number. The first reason is that the Business Day often does not cover company specific news as feature stories (“Front page headlines”), opting for economic or sports headlines. The second reason is that headlines featuring new listing were not considered since they have no historical share price data.

From the 257 feature stories, a total of 164 companies were featured. Some companies were covered more than once in the 6 year period.

4.3.2 Feature story classification

The contents of the feature stories were analysed and the headlines classified in a five point scale:-

- Category 1 = very positive,
- Category 2 = positive/optimistic,



- Category 3 = neutral,
- Category 4 =negative, and
- Category 5 = very negative

This study used a similar method of classification to that of Arnold et al (2007). Although Arnold et al (2007) conceded that the determination of whether a story was positive or negative seems to be very subjective exercise. Arnold et al (2007) used a pattern to classify cover headlines. This paper followed a similar pattern to classify the headline stories (Arnold et al, 2007):

- **Category 1:** Company A “is” or “has done” something very innovative or profitable (**very positive headline**). Example of such headlines includes announcements of increased headline earnings or disposing of an asset or investment where the selling price was greater than the purchase prices.
- **Category 2:** Company A “plans to do” or “is in the process of doing” something innovative for the future, but will it is unclear if it will work (**optimistic headline**). Examples of such headlines include expansion to new markets. Launch of new products and announcements of a Black Economic empowerment (BEE) deal.
- **Category 3:** The headline does not give particular opinion or view point as to whether Company A is good or bad (companies are identified on the headline, but the headline story gives no indication of a positive or



negative angle to the feature i.e. **neutral headline**). Example of such headlines includes resignation of a critical staff member when the company is performing well.

- **Category 4:** Company A has experienced “poor performance,” but the end of the poor performance may be near (pessimistic past but a turnaround is predicted i.e. **negative headline**). Example of such headlines includes announcements of decrease headline earnings or disposing of an asset or investment where the selling price was less than the purchase prices.
- **Category 5:** Company A is doing very poorly, or a scandal has occurred (**pessimistic headline**, sometimes implying a future management change and/or litigation).

4.3.3 Market share price data collection process

For each headline story the following data was collected, using the online McGregor BFA databases, and recorded on a Microsoft excel spreadsheet:-

- Date on which the headline was published
- Name of the company featured
- Market capitalisation of the company feature
- Daily share price of the company for the period of 120 business days prior to and 120 business days after the publishing date),



4.4 Unit of analysis, Population and sample design

The ***unit of analysis*** in the research is a company and the ***unit of observations*** is the share price (Zikmund, 2003). The ***dependent variable*** is the share price movement and the ***independent variable*** is the event covered in the Business Day newspaper article on a particular company on a particular date.

The ***population*** in the case of this research are the 400 companies listed on the main board of the Johannesburg Stock Exchange. The 164 companies featured in the business day between 2002 and 2007 were therefore a ***sample*** for the research. The sampling method was therefore determined by “natural selection” i.e. “the newsmakers got media coverage”.

4.5 Limitations of the sample design

There are three major limitations in the sample design:-

- Due to time constraints the report only studied the Business Day to source cover pages for analysis. This inherently limits the research to just news covered by the Business Day and ignores other newspaper that could have had a “better” story. It was also not possible to cover the size of the whole population (i.e. 400 companies), which given time could have been possible.
- The sampling is determined by “newsmakers” which limits the size of the sample as “newsmakers” tend to be the same companies. This explains the repeat coverage of companies in the sample (i.e. 167 companies were covered in 257 headlines).



- The sampling is based on business day news selection and is non-probabilistic.

4.6 Data analysis methods

4.6.1 Describing and understanding the data

Data on share price, dates, company name, sector, and market capitalisation were recorded and cleaned in an Excel spreadsheet. Plotting and statistical analysis of data was done using Stata version 10 (Stata Corporation, Texas, USA) software.

Movement of share prices before and after the press announcement was initially investigated by plotting the share prices for all the companies in the sample across the whole period before (and on) the day of announcement. The same was repeated for the period on and after the day of announcement.

The graphs were then visually inspected to determine if there were any major changes in the movement of share prices before and after the day of announcement.

Descriptive statistics for market capitalisation was computed and used to describe the distribution of market capitalisation in the sample. Average share price were computed for each company across the whole period before and then after the announcement.



4.6.2 Overview of hypothesis testing

The appropriate test for this purpose is a matched pairs t-test. This test assumes the data is normally distributed. Normality will be investigated by the use of histograms and also by comparing means and standard deviations. Log-transformation of data can be used to make the data approximately normal.

For all the statistical tests, two-sided tests will be carried out at 10% level of significance. P-values will be used to make conclusions on whether or not the null hypothesis should be rejected. The golden rule is that the null hypothesis is rejected when the p-value is less than the level of significance (0.1 in this case).

4.6.3 Testing Hypothesis 1

A statistical test was used to test if there is a significant difference between the average share prices before and after the announcement. This test was carried out as a way of testing **Hypothesis 1**. The appropriate statistical test for this purpose is matched-pairs t-test but since it assumes that the data is normally distributed, the alternative non-parametric Wilcoxon matched-pairs test was used in the case where the data is skewed.



4.6.4 Testing Hypothesis 2

Pearson's correlation was used to measure the strength of the linear relationship between headline categorization and average share price thereby testing *Hypothesis 2*.

Correlation is a measure of the strength of the linear relationship between two variables. It ranges from -1 (indicating perfect negative linear relationship) through 0 (no linear relationship) to +1 (perfect positive linear relationship). The computer output includes the p-values corresponding to each correlation computed.

4.6.5 Testing Hypothesis 3

Hypothesis 3 infers if before-and-after differences in share performance are related to the level of market capitalisation. Market capitalization will first be categorized into low (market capitalization less than median) and high (market capitalization greater than or equal to the median). Matched-pairs t-tests will then be done for the low and high groups separately with respect to the difference in share performance before and after the announcement.

4.6.6 Testing Hypothesis 4

Hypothesis 4 was tested using one-way Analysis of Variance (ANOVA). One-way ANOVA is used to test for the difference in means between more than two groups. A post-hoc test is usually carried when there is a significant difference between groups. This is to determine exactly which combination of



group means differ. However, in this case the post-hoc tests were not carried out as the number of sectors in the sample was too many thereby making such comparisons almost impossible as there will be too many combinations.



Chapter 5: Results

5.1 Introduction

In this chapter the research results are consolidated and presented. The presentation includes descriptive and analytical results from the statistical analysis. The statistical analysis was conducted to test the four hypotheses defined in chapter 4.

5.2 Descriptive statistics for the data

Recall that the headlines were categorised into a five point scale:-

- Category 1 = very positive,
- Category 2 = positive/optimistic,
- Category 3 = neutral,
- Category 4 =negative, and
- Category 5 = very negative

The table below describes the data (i.e. feature stories and share prices) breakdown into categories:-

Table 5.2-1: Descriptive statistics for feature stories

Headline Category	Number of observation in the dataset
Category 1	75
Category 2	95



Headline Category	Number of observation in the dataset
Category 3	19
Category 4	50
Category 5	21
Total	257

5.3 Descriptive statistics for market capitalisation

The descriptive statistics were computed using Stata version 10 and the following output was obtained. Stata was the software used for all the statistical analysis. The table below summarizes these results:

Table 5.3-1: Descriptive statistics for market capitalisation

Statistics	Result
N	257
Mean	24.3463
Standard deviation	56.0858
Minimum	0
Maximum	396
First quartile (25 th percentile)	0.9
Median (50 th percentile)	5
Third quartile (75 th percentile)	18

For the 257 companies, the mean market capitalisation is 24.35 (i.e. R 24 billion) and the standard deviation is 56.09. The minimum is 0 and the

maximum is 396. The first quartile (or 25th percentile) is 0.9 and the third quartile (or 75th percentile) is 18. The median is 5.

5.4 Market Capitalisation skewness

Since the mean (24.3463) is less than the standard deviation (56.0858), it implies that the market capitalisation distribution is skewed and the percentiles indicate that the data is skewed to the right.

In other words, the majority of the market capitalisation values are smaller. Below we did a statistical test for skewness of the distribution of market capitalisation but first we plot a histogram.

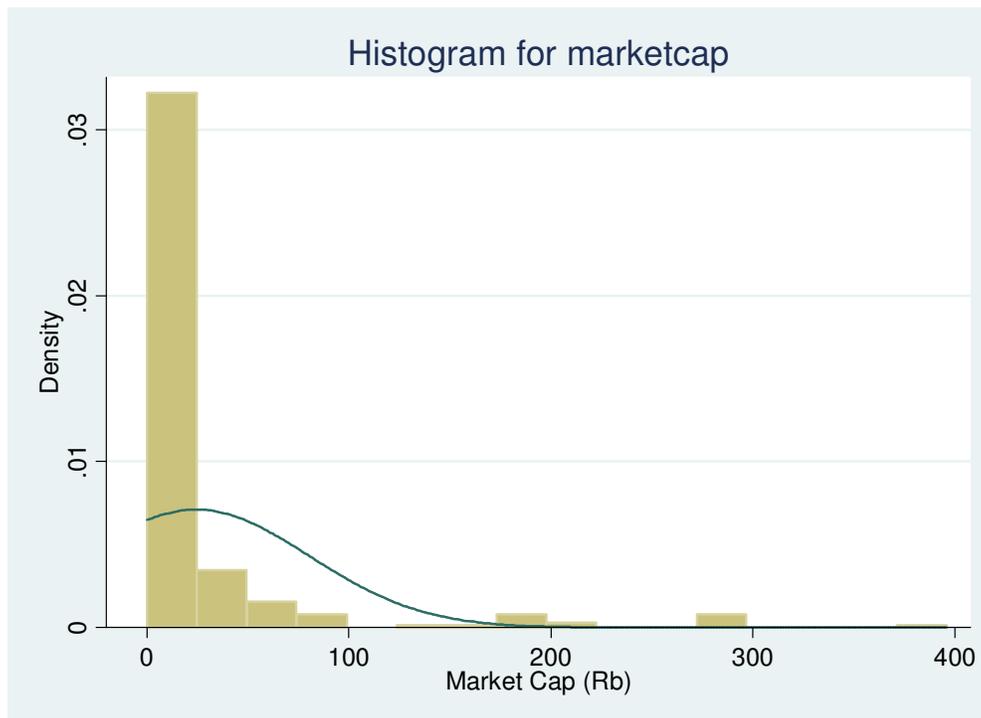


Figure 5.4-1: Market Capitalisation Histogram



The skeweness of the distribution of the market capitalisation can be clearly seen on the histogram. Most of the values are small. Below is the output, from Stata, for the statistical test of skeweness.

```
Skewness/Kurtosis tests for Normality
```

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
marketcaprb	257	0.000	0.000	.	0.0000

The skeweness is confirmed by all the p-values for skeweness, kurtosis and joint (both skeweness and kurtosis) that are less than 0.001 indicating a high statistical significance at 0.1%.

5.5 Descriptive statistics for share price movement

Average share prices were computed for each company over the 120 days for both before and after the announcement. Below, the Stata statistical software output for the descriptive statistics (means and standard deviations) for the share prices before and after the announcement is given. The analysis was categorized further into 90 days, 60 days, 30 days, and 5 days before and after the announcement.

```
tabstat bef_avg120-aft_avg120, stat(mean sd)
```

stats	bef_~120	bef_a~90	bef_a~60	bef_a~30	bef_avg5	aft_avg5
mean	3343.895	3342.412	3329.987	3176.951	3181.612	3691.002
sd	5684.138	5811	5883.828	5311.896	5380.078	7217.388



```

stats | aft_a~30 aft_a~60 aft_a~90 aft_~120
-----+-----
mean | 3640.23 3491.977 3455.309 3437.755
sd | 6816.32 6167.596 6047.578 6021.913
-----+-----

```

The table below summarises the results:

**Table 5.5-1: Descriptive Statistics for Share price Movements - Means
(SD)**

Days	Before	After
120 days	3343.895 (5684.138)	3437.755 (6021.913)
90 days	3342.412 (5811)	3455.309 (6047.578)
60 days	3329.987 (5883.828)	3491.977 (6167.596)
30 days	3176.951 (5311.896)	3640.23 (6816.32)
5 days	3181.612 (5380.078)	3691.002 (7217.388)

The average share prices are in the range from 3176.951 (in cents) (30 days before announcement) up to a maximum of 3691.977 (5 days after the announcement). This seems to indicate that the movement of share prices 30 days before the announcement was very low and they shot to their high 5



days after the announcement. However, we will later conduct a statistical test to confirm if this is statistically significant.

Inspection of the means and the standard deviations reveals that all the means are less than their corresponding standard deviations. This implies that the share prices are also skewed.

5.6 Plot analysis of the data

The first step in the statistical analysis was to draw a plot of the share prices for each of the 257 headlines under study on the same graph in order to see the movement of share prices before and after the date of publish of the headline announcing an event. The data available was for share prices for 120 days before the announcement and also 120 days after the announcement. The graph is given below:

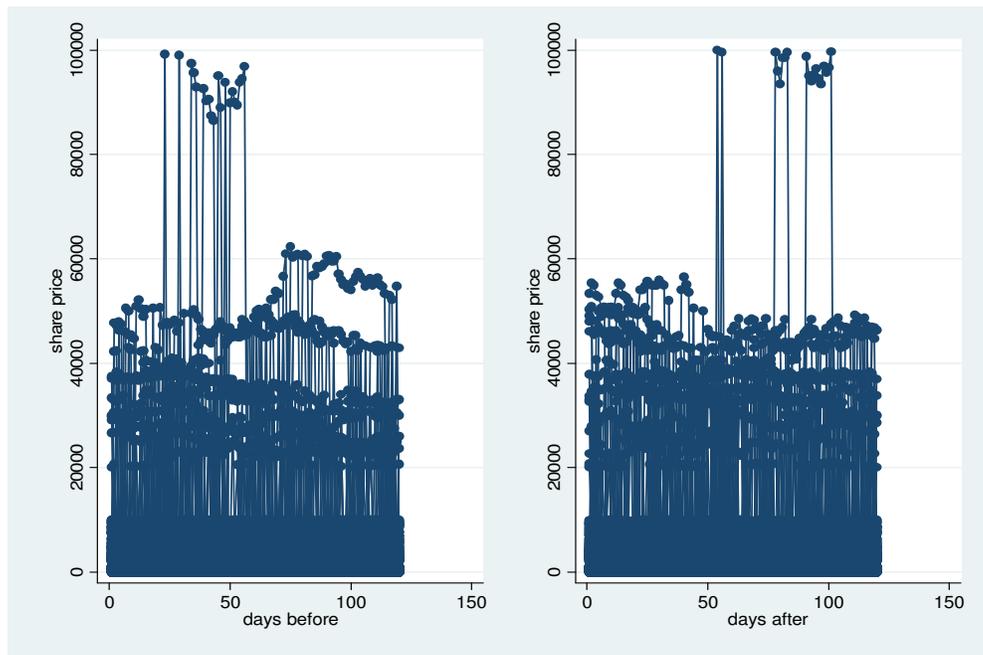




Figure 5.6-1: Plot for 120 days before and 120 day after the announcement

The peaks that are evident on the graph seem to be for one company at 20 to 60 days before the announcement and about 60 to 100 days after the announcement. The reason for these peaks may not be the announcement. There does not seem to be major changes in the movement of the bulk of the other shares in the other companies nearer and after the announcement.

The graphs below show the patterns of companies share price movements before and after an announcement for the various day segments i.e. 90, 60, 30 days.

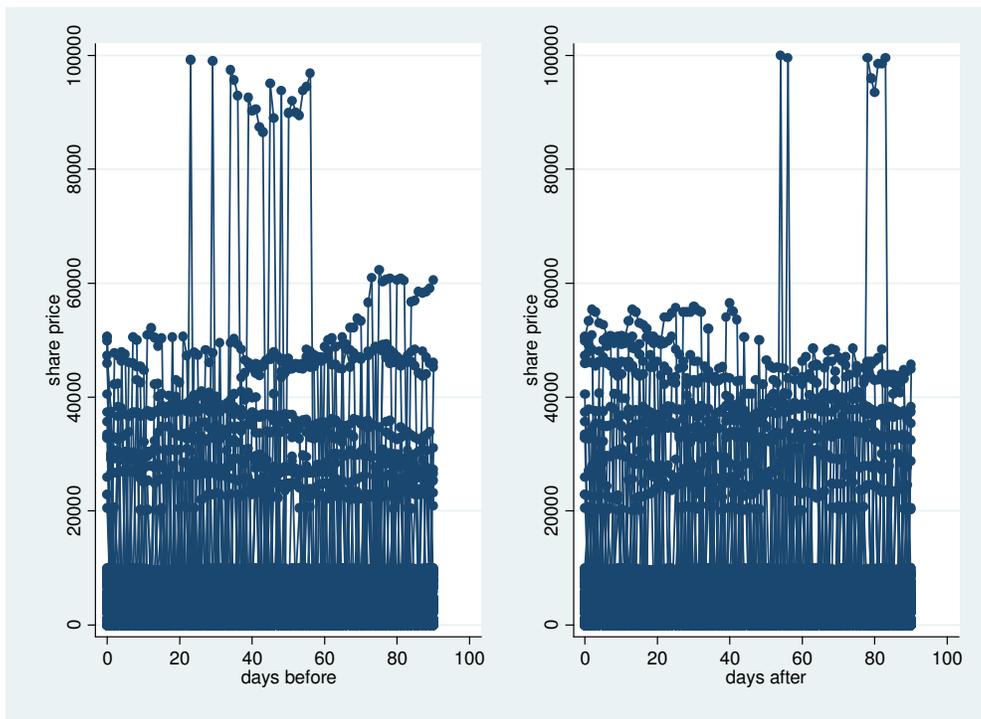


Figure 5.6-2: Plot for 90 days before and after the announcement

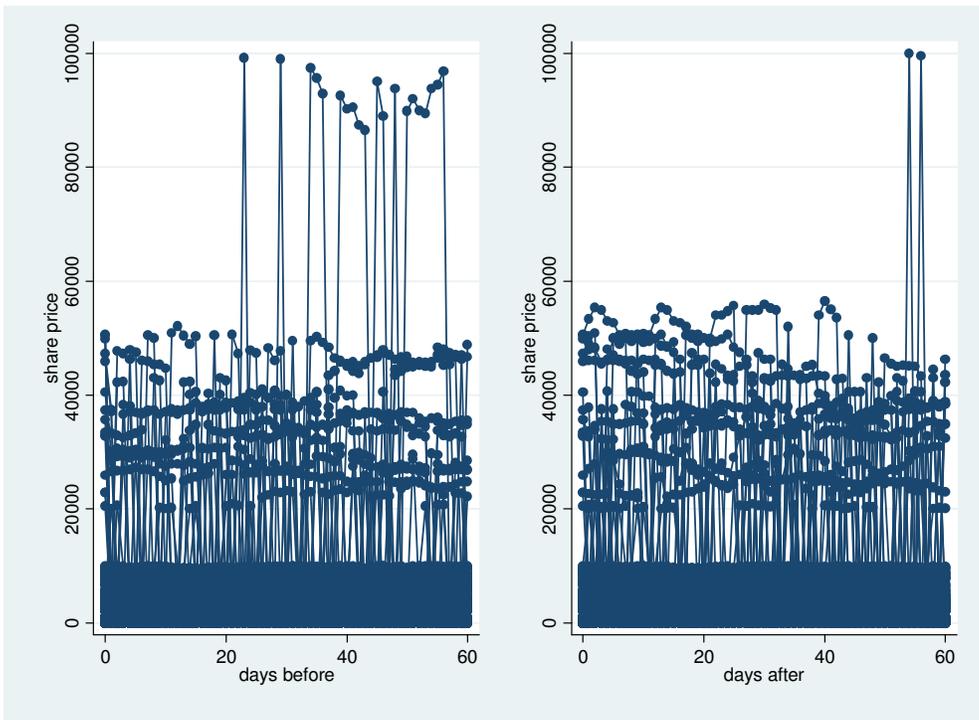


Figure 5.6-3: Plot for 60 days before and 60 day after the announcement

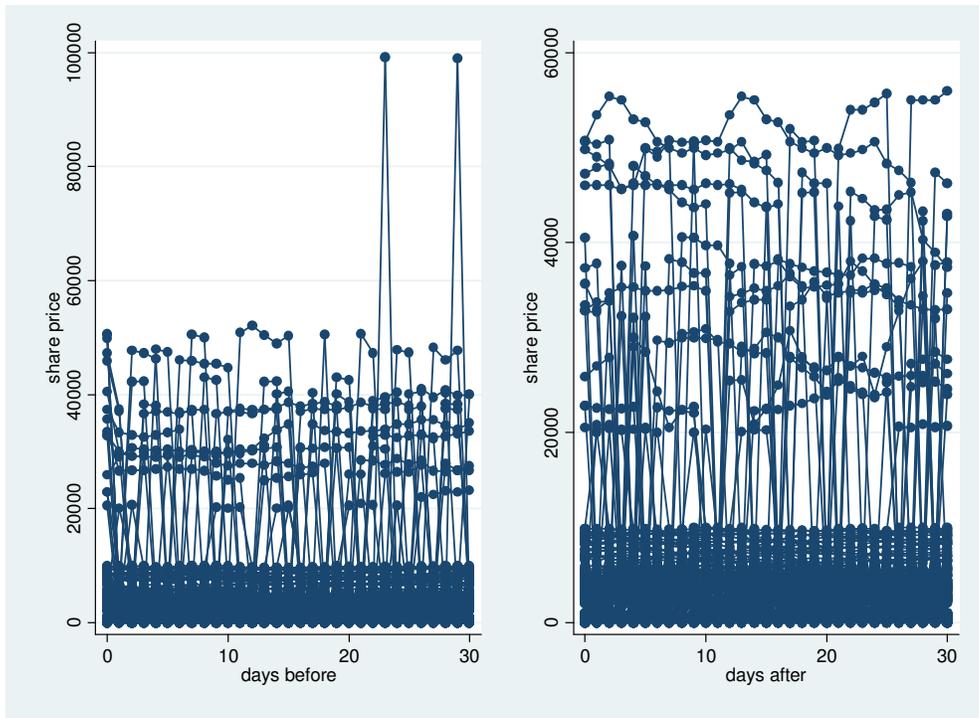


Figure 5.6-4: Plot for 30 days before and 30 days after the announcement

Once again, there does not seem to be a major difference for the share price movement 20 days before and 20 days after the announcement (Please note that the scale for these two graphs is different and so more caution needs to be taken when interpreting them). The same pattern is observed for share price movement 5 days before and 5 days after the announcement.

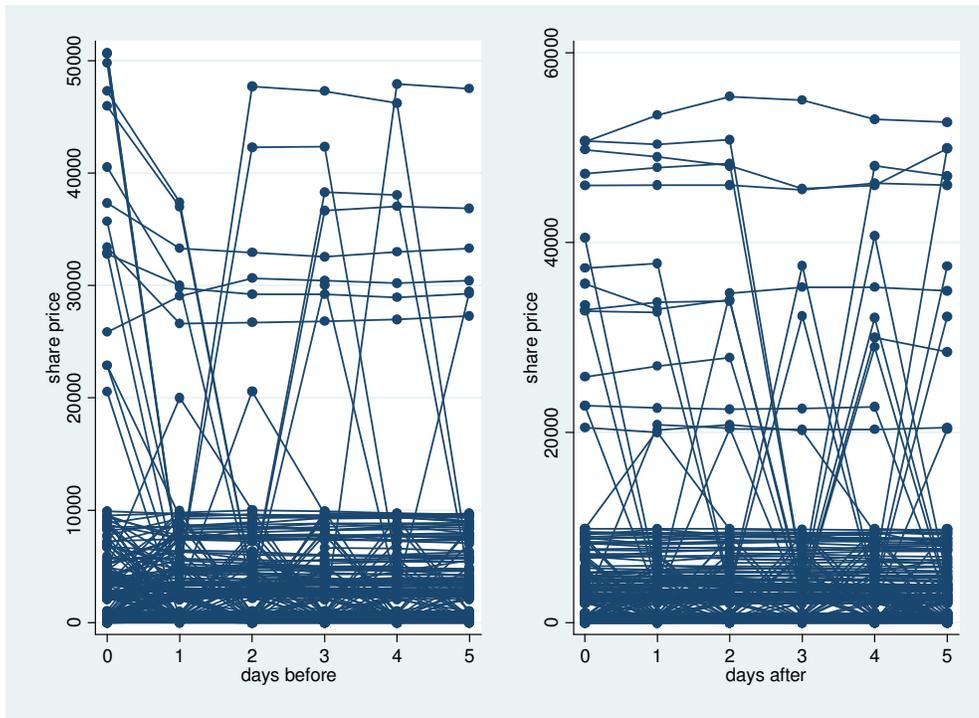


Figure 5.6-5: Plot for 5 days before and 5 days after the announcement

Alternatively, the graphs can be displayed one after the other instead of side by side in order to clearly reveal the pattern shown by the graphs (see appendix A).

The 5 days before graph in figure 5-4 shows a sharp decrease in share price of three companies one day before the cover story followed by a sharp increase on the day of announcement. There is also evidence of a similar drop and peak one day after the day of the cover story. But for the majority of the companies, there doesn't seem to be a big impact caused by the cover story. A statistical test as defined in chapter 4 still needs to be conducted to test if the difference in the means of before-and after share performances is statistically significant.



5.7 Hypothesis 1

Hypothesis 1 supposes that there is a link between press announcements and share price performance. Average share prices were computed for each company over the whole 120 days for both before and after the announcement.

Below, the output for the descriptive statistics (means and standard deviations) for the share prices before and after the announcement is given.

The analysis was categorised further into 90 days, 60 days, 30 days, and 5 days before and after the announcement.

Table 5.7-1: Mean (SD) of share performance

Days	Before	After
120 days	3343.895 (5684.138)	3437.755 (6021.913)
90 days	3342.412 (5811)	3455.309 (6047.578)
60 days	3329.987 (5883.828)	3491.977 (6167.596)
30 days	3176.951 (5311.896)	3640.23 (6816.32)
5 days	3181.612 (5380.078)	3691.002 (7217.388)



The biggest difference in share price between before and after values is clearly seen in the 5 days category followed by the 30 days category and so on. A statistical test needs to be done to test if the differences above are statistically significant.

Inspection of the means and the standard deviations reveals that all the means are less than their corresponding standard deviations. This implies that the share prices are skewed. Since the matched pairs t-test requires the data to be normally distributed, the data was log-transformed and then tested for normality.

The histograms revealed that the log-transformed data was approximately normal and therefore matched-pairs t-test was done on the log-transformed data. The results of the matched-pairs t-test are shown below. Analyses were categorized into 120, 90, 60, 30, and 5 days before and after the announcement. The table below summarizes the results from the output.

Table 5.7-2: P-values for the statistical test for difference before and after announcement

Category	P-value
120 days	0.0523*
90 days	0.0395**
60 days	0.0330**
30 days	0.0535*



Category	P-value
5 days	0.6286

Please note that the * in the table above means the difference before and after is significant at 10% level and ** means the difference before and after is significant at 5% level.

Results show that there was a statistically significant difference in the share performance between the before performance and after performance. The significant difference was present with regards to the 120, 90, 60, and 30-day average share prices.

No significant difference was found for the 5-day averages. It is therefore concluded that Hypothesis 1 is true. These could be interpreted as that the markets have factored the anticipated news prior to it being announced on the newspaper.

5.8 Hypothesis 2

The second hypothesis supposes that there is a positive relationship between a positive headline and share price performance (or conversely there is a negative relationship between a negative headline and share price performance).



5.8.1 Overall correlation test

A correlation test was done to between overall headline categorisation and share price performance. The analysis was conducted separately for 120, 90, 60, 30, and 5 days before and after the announcement. The results from the Stata output are summarized in the table below.

Table 5.8-1: Correlation between headline categorization and share performance: Correlation (p-value)

Days	Before	After
120 days	-0.0724 (0.2478)	-0.1408[*] (0.0240)
90 days	-0.0763 (0.2229)	-0.1495^{**} (0.0165)
60 days	-0.0856 (0.1711)	-0.1606^{***} (0.0099)
30 days	-0.0843 (0.1778)	-0.1781^{***} (0.0042)
5 days	-0.0975 (0.1188)	-0.1785^{***} (0.0041)

Please note that the * in the above table means that the difference before and after is significant at 10% level, ** means the difference before and after is significant at 5% level and *** means the difference before and after is significant at 1% level.



The results show that the correlations between headline category and share performance are very highly significant with regards to share performance after the announcement. This is with respect to all the categories (120, 90, 60, 30 and 5-day averages).

All the correlations are negative. The negative sign is expected because the scale of the categorisation was from very positive (1) to very negative (5). This implies that there was a highly significant positive correlation between headline categorisation and share performance after the announcement.

The highest and most significant correlation observed was -0.1785 (for 5 days after announcement) and the smallest and least significant correlation was -0.1408 (120 days after the announcement). It is therefore concluded that Hypothesis 2 is true i.e. positive headlines lead to positive share price performance.

5.8.2 Detailed headline category test

Recall that the front stories of the business day were categorised or rated according to a five-point scale (1 = very positive, 2 = positive/optimistic, 3 = neutral, 4 = negative, and 5 = very negative). Matched-pairs t-test was used to test for the before-after differences in log-transformed average share prices per headline categorization. The analysis was, once again, done for the period covering 120, 90, 60, and 30 and 5 days before and after press announcement.



The p-values from these results are summarised in the table below.

Table 5.8-2: P-values for before-after differences per headline category

Days	Very positive	Positive	Neutral	Negative	Very Negative
120	0.0515*	0.0470**	0.0451**	0.7085	0.0228**
90	0.0699*	0.0196**	0.0388**	0.7274	0.0230**
60	0.0547*	0.0310**	0.0395**	0.9779	0.0326**
30	0.0390*	0.0284**	0.0843*	0.5525	0.0444**
5	0.3101	0.3626	0.1308	0.3654	0.0631*

Please note that the * in the table above means the results had a statistically significant difference at 10% level, and the ** means statistically significant difference was at 5% level

The results show highly statistically significant differences in share performance before and after the announcement with regards to headline categories 1, 2, 3, and 5 but not 4. The results are significant at 5% level of significance for 120, 90, 60, and 30-day categories.

5.9 Hypothesis 3

Hypothesis 3 supposes that the impact of an announcement on a share price performance depends on the market capitalisation of the company. A matched pairs test for before and after share price performance (for periods 120, 90, 60, 30 and 5 days before and after announcement) was computed.



Since the median for market capitalization was shown to be 5 earlier in this chapter, categorisation into low and high market capitalisation groups was done using a cut-off value of 5. The median was chosen because the market capitalization distribution was shown to be skewed.

Log-transformed share performance was used because the matched-pairs t-test assumes normality. Analyses were categorized as above. These results are summarized in the table below.

Table 5.9-1: Matched-pairs t-tests p-values for before-and-after performance for market cap categories

Days	Low market capitalization	High market capitalization
120 days	0.1647	0.1776
90 days	0.2799	0.0614*
60 days	0.4640	0.0160**
30 days	0.7406	0.0138**
5 days	0.3404	0.0712*

Please note that the * in the table above means the difference before and after is significant at 10% level and ** means the difference before and after is significant at 5% level.

The results show that there are significant differences between before-and-after performance with respect to high market capitalization group and not



with respect to low market capitalization group. It is then concluded that Hypothesis 3 is true.

5.10 Hypothesis 4

Hypothesis 4 supposes that the impact of an announcement on share price performance depends on the JSE sector the company is in. One-way analysis of variance (ANOVA) was used to test for the differences in log-transformed average share prices between the sectors.

The analysis was, once again done according to 120, 90, 60, 30 and 5 days before and after announcement.

It is very clear from the results that all the p-values (see Stata outputs below, p-values are highlighted in yellow) are less than 0.01 showing very high statistically significant difference in the average share performance between the sectors. This is true for all the categories of analysis (that is, 120, 90, 60, 30 and 5 days before and after announcement).

The Stata output below shows the Anova results for the sectors for periods 120, 90, 60, 30 and 5 days before and after the press announcement:-



5.10.1 Anova test results 120 days before and after the press announcements

*! Link between sector and performance

```
. oneway logbef_avgl20 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	151.883139	18	8.43795217	3.35	0.0000
Within groups	599.053119	238	2.51702991		
Total	750.936258	256	2.93334476		

Bartlett's test for equal variances: $\chi^2(18) = 31.7979$ Prob> $\chi^2 = 0.023$

```
. oneway logaft_avgl20 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	134.504667	18	7.4724815	3.21	0.0000
Within groups	554.866498	238	2.33137184		
Total	689.371165	256	2.69285611		

Bartlett's test for equal variances: $\chi^2(18) = 44.5755$ Prob> $\chi^2 = 0.000$



5.10.2 Anova test results 90 days before and after the press announcements

. oneway logbef_avg90 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	148.997583	18	8.27764348	3.29	0.0000
Within groups	598.022034	238	2.51269762		
Total	747.019616	256	2.91804538		

Bartlett's test for equal variances: $\chi^2(18) = 29.4742$ Prob> $\chi^2 = 0.043$

. oneway logaft_avg90 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	131.096102	18	7.28311679	3.08	0.0000
Within groups	563.016101	238	2.36561387		
Total	694.112203	256	2.71137579		

Bartlett's test for equal variances: $\chi^2(18) = 44.8576$ Prob> $\chi^2 = 0.000$



5.10.3 Anova test results 60 days before and after the press announcements

. oneway logbef_avg60 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	154.529679	18	8.58498217	3.37	0.0000
Within groups	606.488284	238	2.5482701		
Total	761.017963	256	2.97272642		

Bartlett's test for equal variances: $\chi^2(18) = 31.8799$ Prob> $\chi^2 = 0.023$

. oneway logaft_avg60 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	128.15152	18	7.11952891	2.94	0.0001
Within groups	577.08303	238	2.42471861		
Total	705.234551	256	2.75482246		

Bartlett's test for equal variances: $\chi^2(18) = 41.7472$ Prob> $\chi^2 = 0.001$



5.10.4 Anova test results 30 days before and after the press announcements

. oneway logbef_avg30 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	147.097872	18	8.17210401	3.11	0.0000
Within groups	625.001914	238	2.62605846		
Total	772.099787	256	3.01601479		

Bartlett's test for equal variances: $\chi^2(18) = 30.9957$ Prob> $\chi^2 = 0.029$

. oneway logaft_avg30 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	137.191531	18	7.62175173	3.03	0.0001
Within groups	599.097497	238	2.51721637		
Total	736.289028	256	2.87612902		

Bartlett's test for equal variances: $\chi^2(18) = 44.8199$ Prob> $\chi^2 = 0.000$



5.10.5 Anova test results 60 days before and after the press announcements

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. oneway logbef_avg5 sector
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Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	156.019591	18	8.66775504	3.01	0.0001
Within groups	685.167517	238	2.87885512		
Total	841.187108	256	3.28588714		

Bartlett's test for equal variances: $\chi^2(18) = 29.8772$ Prob> $\chi^2 = 0.039$

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. oneway logaft_avg5 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	134.949581	18	7.49719896	2.30	0.0025
Within groups	774.921846	238	3.25597414		
Total	909.871427	256	3.55418526		

Bartlett's test for equal variances: $\chi^2(18) = 52.6454$ Prob> $\chi^2 = 0.000$

5.10.6 Anova Test Conclusions

The conclusion is therefore that there is a very strong link (and also statistically significant) between sector and share price performance. Because of a large number of the sectors (19), it is very difficult (and time consuming) to pinpoint which sectors differ from which other sectors. It is therefore concluded that Hypothesis 4 is true.



Chapter 6: Discussion of Results

6.1 Introduction

This chapter interprets and discusses the results of the statistical analysis defined in chapter 5. The results are discussed through the hypotheses as set out in chapter 3, with the literature review of chapter 2 setting the context. Key concerns with the results are also highlighted.

6.2 Hypothesis 1

Hypothesis 1 supposes that there is a link between press announcements and share price performance. In particular a test was conducted to establish if $\mu_{+t} \neq \mu_{-t}$ where μ_{+t} is the mean of the share price after the press announcement and μ_{-t} is the mean of the share price before the press announcement. The alternative hypothesis was that $\mu_{+t} \approx \mu_{-t}$.

Most of the theory reviewed, although divergent on the magnitude of the impact, supports hypothesis's 1 assertion. Most of the authors of the theory found a positive link between media announcements and share price performance (Arnold et al (2007), Ferreira and Smith (2003), Jones et al (2004), Pruitt et al (2004) and Hyderabad (2009)). Rosen (2006) found a positive link in the short run but negative in the long run.

Desai and Jain's (2004) study of share splits announcements found a negative link. Poitras (2004) established a relationship between announcements of the macro economic factors and stock prices.



The initial plot of the share price movements, around the announcement time, for JSE listed companies shows that the trend does not change before and after the press announcement. This observation leads to the conclusion that hypothesis 1 should be rejected (See figure 5-1 to 5-5). A statistical test revealed different results.

The statistical test on hypothesis 1 resulted in p-values which are less than 10% which implies that the average share price difference, before and after an announcement, is statistically significant, less so in the period leading to the announcement (i.e. 5 days before and after the announcement) .

The statistical test was done for the period 120, 90, 60, 30, and 5 days before and after the announcement. There average share price difference found was to be statistically significant for all periods. Hypothesis 1 is therefore accepted.

This implies that the South African capital market is similar, in reactions to press announcements, to the markets that were investigated by the authors of the literature review. Those markets include the US, Europe, Australia and India.

This result is consistent with most of the theory reviewed. One would expect the difference between the developed markets (US, Europe and Australia) and emerging markets due to different characteristics of the markets (literacy rates in the populations, stock market maturity etc.).



Hyderabad's (2009) study found a link between press announcement and share price performance in the Indian capital markets, once again indicating that South African and the rest of the capital markets in the developing world will see a link between press announcement and share price movements.

It is therefore concluded that hypothesis 1 is accepted and the conclusion is that press announcements do impact on the share price performance of the company that is the subject of a headline.

6.3 Hypothesis 2

Hypothesis 2 supposes that there is a positive relationship between a positive headline and share price performance (or conversely there is a negative relationship between a negative headline and share price performance). In particular a test was conducted to establish if $\mu_{+1} > \mu_{-1}$ where μ_{+1} is the mean of the share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement. The alternative hypothesis was that $\mu_{+1} \leq \mu_{-1}$ or $\mu_{+1} \approx \mu_{-1}$.

Theory reviewed in chapter 2 support hypothesis 1. Although Arnold et al (2007) studied magazines rather than newspapers; they found that positive cover page stories can be correlated to positive stock performance. Arnold et al found the same argument holding true for negative performance and negative stock performance.



Arthur and Cook (2004) were able to correlate positive announcements (in their case the positive news were announcement of work-family initiatives) to positive shareholder returns. Ewing et al (2006) showed that announcement relating to natural disasters (which could be deemed negatives announcements) had a negative impact on insurance companies.

Collet's (2004) research is contradictory to most literature reviewed. Collet (2004) found that negative trading statements outnumber positive trading statements by 50%, and, that market reaction, measured by abnormal returns, is considerably greater for the negative statements (Collet, 2004).

A test for correlation shows that there is sufficient evidence to conclude that positive headlines lead to positive share price performance (or conversely negative headlines lead to negative share price performance).

Hypothesis 2 was accepted as the p-values for the periods 120, 90, 60, 30, and 5 days before and after the announcement showed that the difference in the means of share prices was statistically significant (see table 5-4) and that there average share price was higher for the period post the announcement.

The highest and most significant correlation observed was -0.1785 (for 5 days after announcement) and the smallest and least significant correlation was -0.1408 (120 days after the announcement) which shows that the impact of front page news on share price performance diminish over the long run.



Recall that news or announcements were categorised into a five-point scale (1 = very positive, 2 = positive/optimistic, 3 = neutral, 4 = negative, and 5 = very negative).

The category results from the matched-pairs t-test conducted in chapter 5 shows that there is a highly statistically significant differences in share performance before and after the announcement with regards to headline categories 1, 2, 3, and 5 but not 4. The results were significant at 5% level of significance for the period 120, 90, 60, and 30 days before and after the press announcement.

A more careful inspection of these results shows that the differences for negative category (i.e. category 4) were not statistically significant. This means that there was no significant impact on the share price performance caused by the negative headline story.

This is consistent with the finding by Papasyriopoulos et al. (2007). Papasyriopoulos et al. (2007) found that bad news had a marginal negative effect on companies' abnormal returns for Greek firms in the construction sector.

Very negative headlines caused statistically significant differences in the share price. Inspection of the Stata (see appendix A) output shows that all the significant differences pertaining to very negative story were actually negative (difference defined as the mean for the after announcement share price



performance minus the mean for the before announcement share price performance). This implies that the share price after the headline story in the business day was lower than the share price before the headline story.

Positive stories (1 and 2) also yielded highly significant positive differences (see the Stata output in appendix B). Neutral stories surprisingly yielded statistically significant positive differences. Positive differences imply that the story had a positive impact in increasing the share price performance.

Neutral stories could have been incorrectly classified as the statistical analysis of the data shows that the market viewed the announcement favourably. As mentioned before, news classification can at times be very subjective.

This is consistent with the results of Arnold et al (2007) with the difference being that the negative stories do not necessary lead to a negative performance. Hence the other part of hypothesis 2 (i.e. negative headlines lead to a negative share price performance) is rejected.

Based on empirical evidence, the null hypothesis is adopted i.e. $\mu_{+1} \approx \mu_{-1}$ where μ_{+1} is the mean of the share price after the press announcement and μ_{-1} is the mean of the share price before the press announcement.

Hypothesis 2 is partly accepted i.e. positive headlines lead to a positive share price performance but negative headlines do not necessary lead to a negative share price performance.



6.4 Hypothesis 3

Hypothesis 3 supposes that the impact of an announcement on a share price performance depends on the market capitalisation of the company. The alternative hypothesis was that the impact of a press announcement on share price performance **does not** depend on the market capitalisation of the company.

Arnold et al. (2007) analysed companies that were subject of feature stories in the Business week, Fortune and Forbes magazines during the period between 1983 and 2002. Typical companies covered by these publications are blue chip companies that have a large market capitalisation.

One would then expect to have the same result as Arnold et al. (2007) for companies with large market capitalisation i.e. there is a positive cover page stories can be correlated to positive stock performance.

The statistical test was, once again, done for the periods 120, 90, 60, 30 and 5 days before and after announcement. This was to test for the effect of market capitalisation on the impact of front page coverage on share price performance.

Recall that the data set median for market capitalisation was used to categorise companies into low and high market capitalisation groups; and that the cut-off value of 5 was used.



The results show that there are statistically significant differences between before-and-after performances for companies with high market capitalisation compared to those with a low market capitalisation.

Hence it can be concluded that the market capitalisation has an effect on how impactful front page news coverage can be on share price performance.

6.5 Hypothesis 4

Hypothesis 4 supposes that the impact of an announcement on share price performance depends on the JSE sector the company is in. The alternative hypothesis was that the impact of an announcement on share price performance **does not** depend on the JSE sector the company is in.

The theory reviewed indicated that for companies in the sporting sector, there were positive abnormal returns observed after an announcement of a sponsorship (Spais and Filis (2008) and Pruitt et al (2004)).

Papasyriopoulos, et al (2007), found that positive news have a positive effect on abnormal returns for Greek industrial and construction firms.

The results from the Nova test showed clearly that there is a statistically significant difference in the share performance between the sectors. This was found to be true for all the periods tested in the analysis (that is, 120, 90, 60, 30 and 5 days before and after announcement).



It is therefore concluded that there is a very strong link (and also statistically significant) between sector and share price performance. This means that the magnitude of the impact of press announcements will differ according to a sector a company is classified under. Because of a large number of the sectors (19), it is very difficult (and time consuming) to pinpoint which sectors differ from which other sectors.

6.6 Average Returns Observed

The average returns were computed using table 6.2-1 as shown below

Table 6.6-1: Average Returns Calculation

Days	Before	After	% return
120 days	3343.895 (5684.138)	3437.755 (6021.913)	$(3437.755 - 3343.895)$ $\div 3343.895 = 2.81\%$
90 days	3342.412 (5811)	3455.309 (6047.578)	3.38%
60 days	3329.987 (5883.828)	3491.977 (6167.596)	4.86%
30 days	3176.951 (5311.896)	3640.23 (6816.32)	14.58%
5 days	3181.612 (5380.078)	3691.002 (7217.388)	16.01%



The above table shows that the average returns are the highest around the period of the announcements (5 days before and after). The average returns for the period are 16 percent. These results indicate that the average returns diminish over the long run.

Hyderabad (2009) found that the average abnormal returns (AAR), of companies listed in the Indian stock market, on the date of announcement (of a share buyback) are 2.83 percent, while cumulative abnormal returns (CAR) are about 6 percent on the announcement date with an overall CAR 5.16 percent for 41-day event window.

Brown (2007) found that Australian companies had smaller but significant abnormal returns (around 1.2%), on the announcement date, compared to studies in the US which found abnormal returns of around 8%.

It can be concluded that based on the empirical results, the average returns in the South African capital market exceed those observed in the developed countries.

6.7 Conclusion

All hypotheses were accepted, except for hypothesis 2 which was partially accepted. The findings of the research are highly consistent with the literature. The paper therefore concludes that press announcements are effective



contrarian indicators for companies listed on the Johannesburg Stock Exchange (JSE).

This implies that press announcement do impact of the share price performance for JSE listed companies; and that positive headlines lead to positive share price performance. The converse does not hold though.

Negative headlines do not necessarily lead to negative share price performance. This is also highly consistent with the theory reviewed. The paper has shown that the impact of the press announcement is significantly influence by market capitalisation and JSE market sector.



Chapter 7: Conclusion

7.1 Introduction

In this chapter, the main findings and conclusions that were drawn in chapter are highlighted. This chapter also discusses the insights and implications based on the results. This chapter presents a set of recommendations. Possible future research is also highlighted.

7.2 Summary of key findings

News paper headlines have been proved to be effective contrarian indicators. This phenomenon has been shown across the major capital markets in the world. South Africa is not different. As expected and proved by this research, newspaper headlines have an impact on a company's share price performance.

This research has shown that positive feature stories headlined on Business Day lead to a positive company performance and negative headlines follow extremely negative performance. Furthermore, the research was able to find that the impact of the headlines is greatly influenced by a company's market capitalisation and the JSE sector that the company is in.

For positive headlines the average return was found to be 16% in the short run (5 days before and after the press announcement). This return far exceeds the returns reported in the developed capital markets such as in the



US, Europe and Australia. The returns were found to diminish in the long run (120 days before and after the press announcement).

7.3 Recommendations to main stakeholders

7.3.1 Investors

All investors (fund managers, institutional investors and individuals) should factor the study of newspaper coverage in their investment strategies. Investors should consider including, in their stock portfolio, companies that are subject of good headlines.

Institutions and asset managers should take particular caution with newspaper headlines for a company with a large market capitalisation. The impact on such companies has been shown to be far greater than companies with a small market capitalisation. This would require a improved relationships with the company.

Investors also need to better understand which sectors react significantly to press announcements as this would have an impact of improving or reducing the value of their share holding in featured companies. This research has shown that companies in some sectors experience a greater impact compared to companies in other sectors.



7.3.2 Companies featured in headlines

Companies that are a feature of negative headlines should manage the media coverage. This media management should include counter announcements of something positive the company is engaged in. A media announcement of turning around a bad situation could itself lead to an improved share price performance.

Failure by companies (especially ones with a large market capitalisation and in certain sectors of the JSE) to manage negative publicity could lead to a negative share price performance.

7.4 Ideas for future research

There are a number of ideas for future research in the field of newspapers as contrarian indicators in the Johannesburg Stock Exchange. The ideas are as follows: -

7.4.1 Improved dataset

A similar analysis can be conducted using a greater number of companies i.e. a larger dataset. One way to achieve this is to expand the period of analysis to cover business day headlines from 1997 to 2007. The current research analyses headlines from 2002 to 2007.

The other way of increasing the dataset is to include other newspaper publications in the analysis period. Other publications may include The



Business Report (which is published daily as part of the star newspaper) and the ***Sunday Times*** newspaper which is published weekly.

7.4.2 Research using other publications

An interesting research will be to investigate weekly magazines as contrarian indicators on the Johannesburg Stock Exchange. Magazines that could be subjects of such a research include the ***Financial mail*** and the ***FinWeek***.

Another interesting research will be to investigate the impact of business television and radio shows as contrarian indicators. Television and radio shows that could be investigated include Summit Television inserts and the Moneyweb radio shows.

7.4.3 Utilisation of the event study methodology

Another interesting research can be the use of the event study methodology to estimate the impact of newspaper announcements on share price performance. The current research used a statistical test that concerned itself with investigating if there is a significant difference between the average share prices before and after the announcement for the period chosen.

7.5 Conclusion

The value of this research was to prove that newspapers are effective contrarian indicators for companies listed on the Johannesburg Stock Exchange. The research went further into assessing if the magnitude of



impact of these press announcements were influenced by the market capitalisation and a sector of the company featured.

It was shown that press announcement do have an impact on share price performance and that this impact is significantly higher than that reported in developed capital markets.

The research was able to prove that positive press headlines lead to a positive share price performance and that negative press headlines lead to negative share price performance.

It was further established that companies with a large market capitalisation experience a greater impact as a result of the press announcements compared to companies that have a smaller market capitalisation. The sector the company is classified under seemed to show that it has an influence on the impact of the press announcement.



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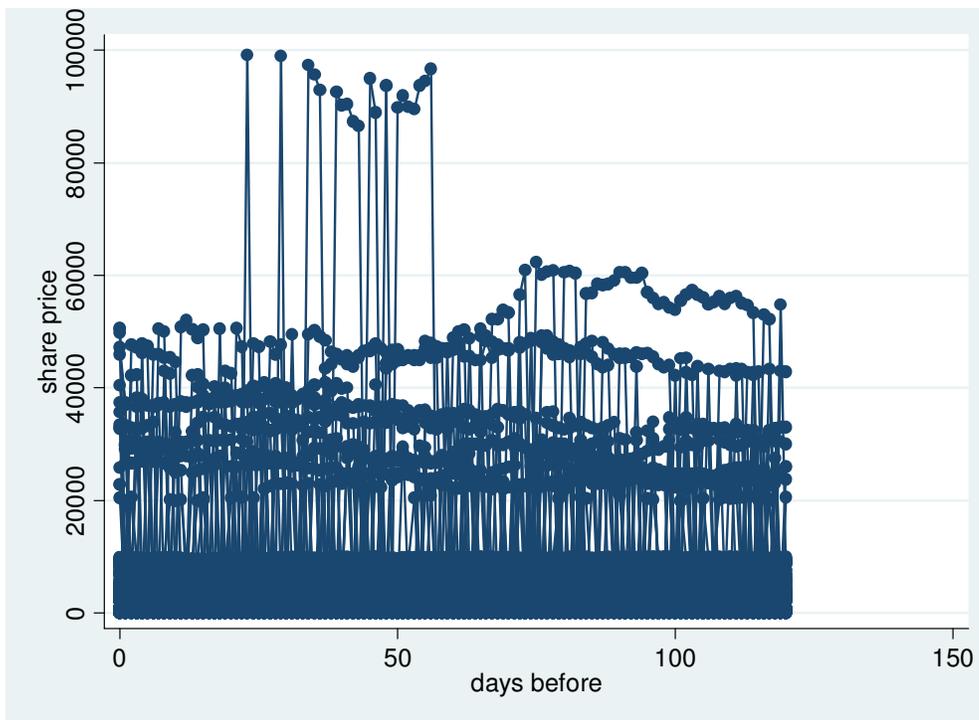
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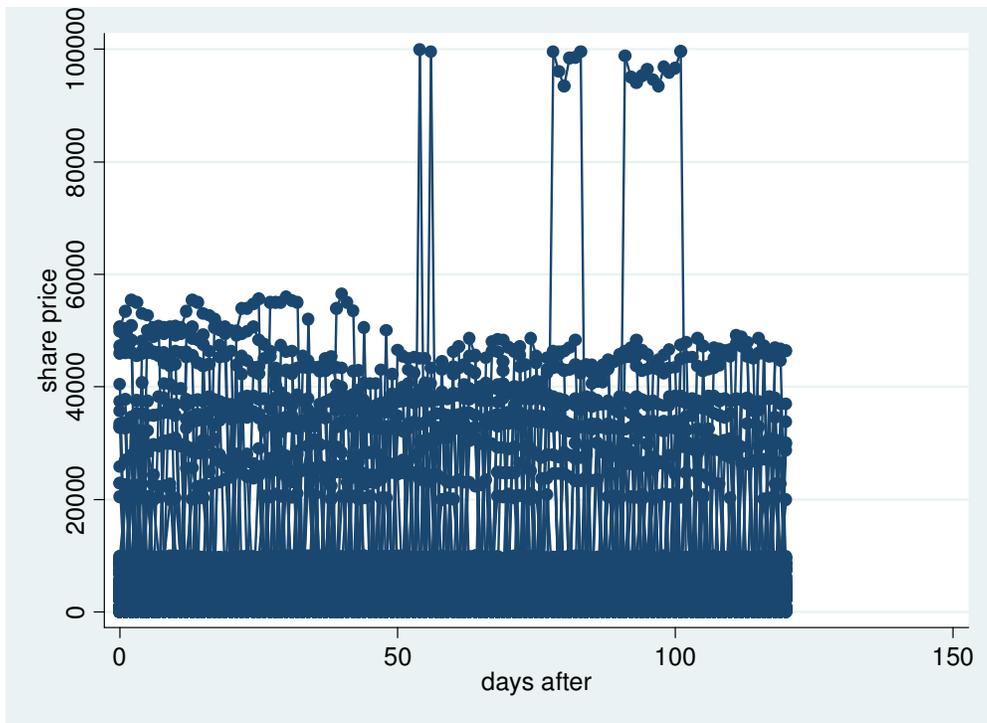


9 Appendix A – Statistical analysis outputs

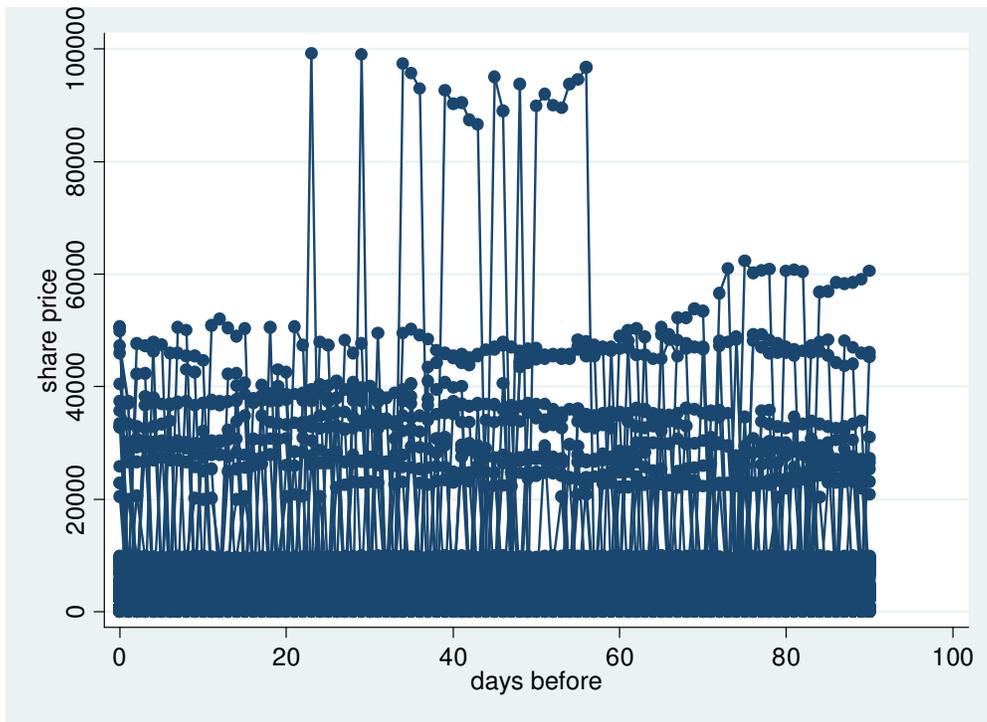
9.1 Share Price Movement Plots

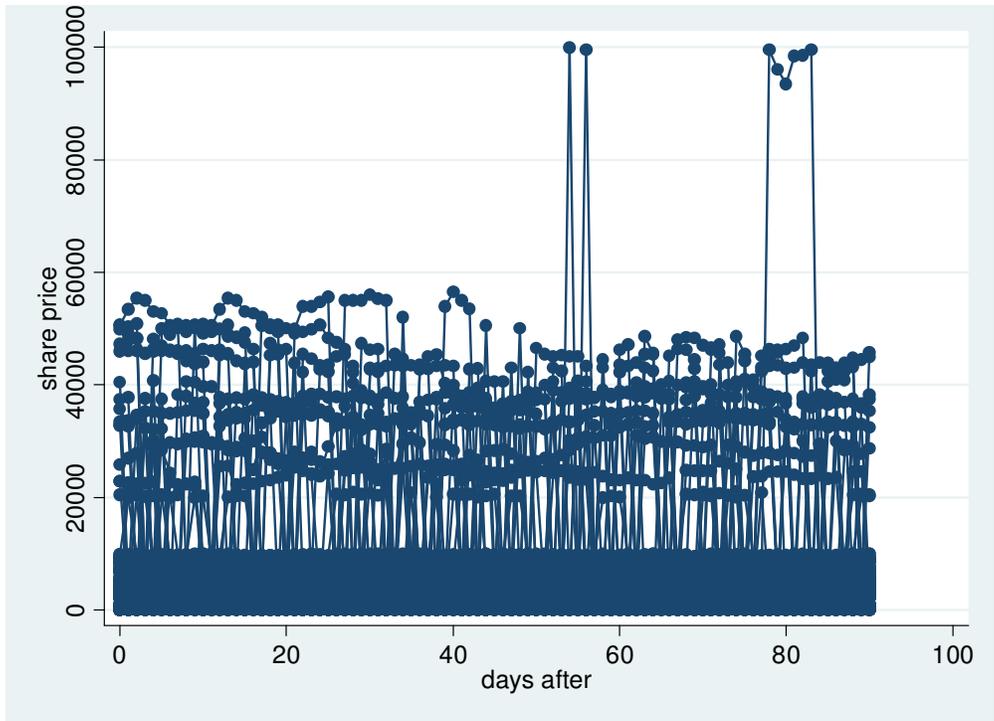
50 Days



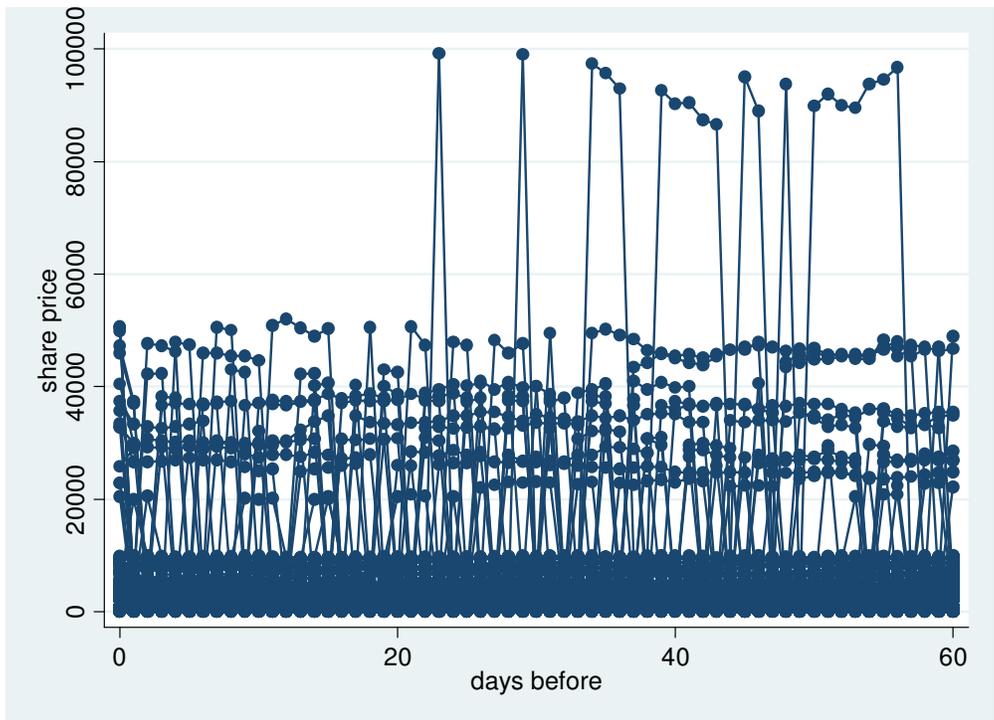


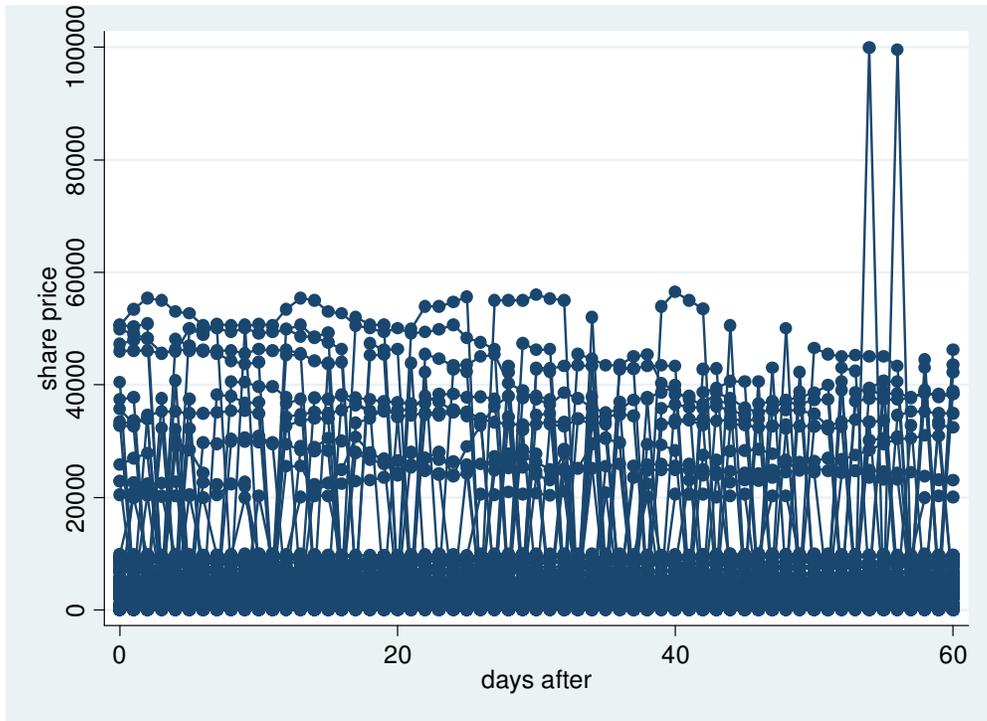
60 Days



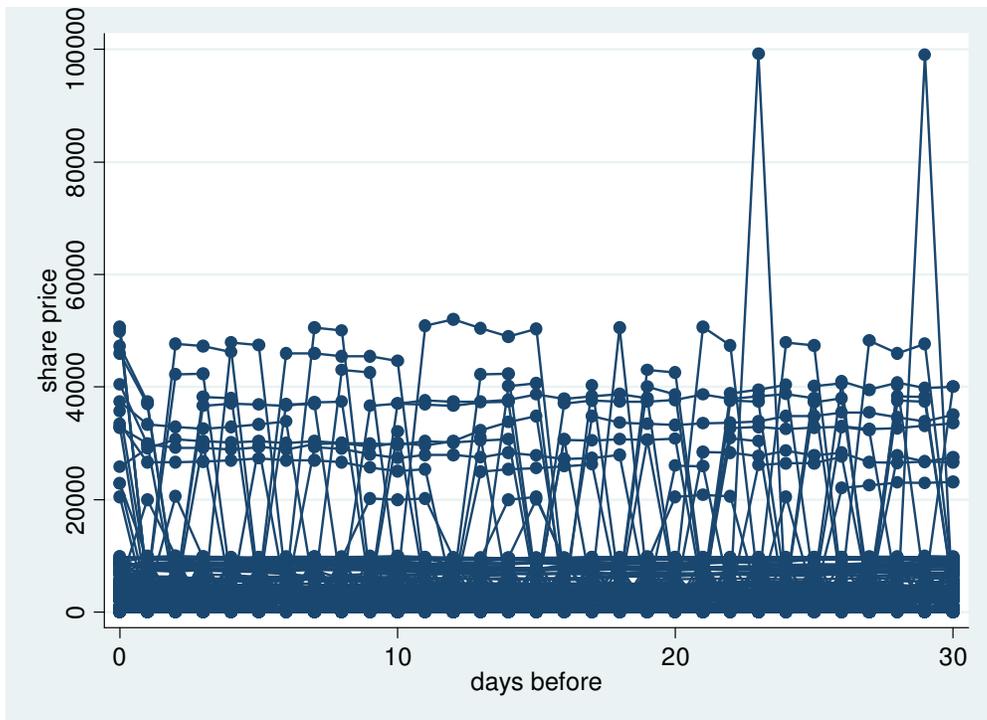


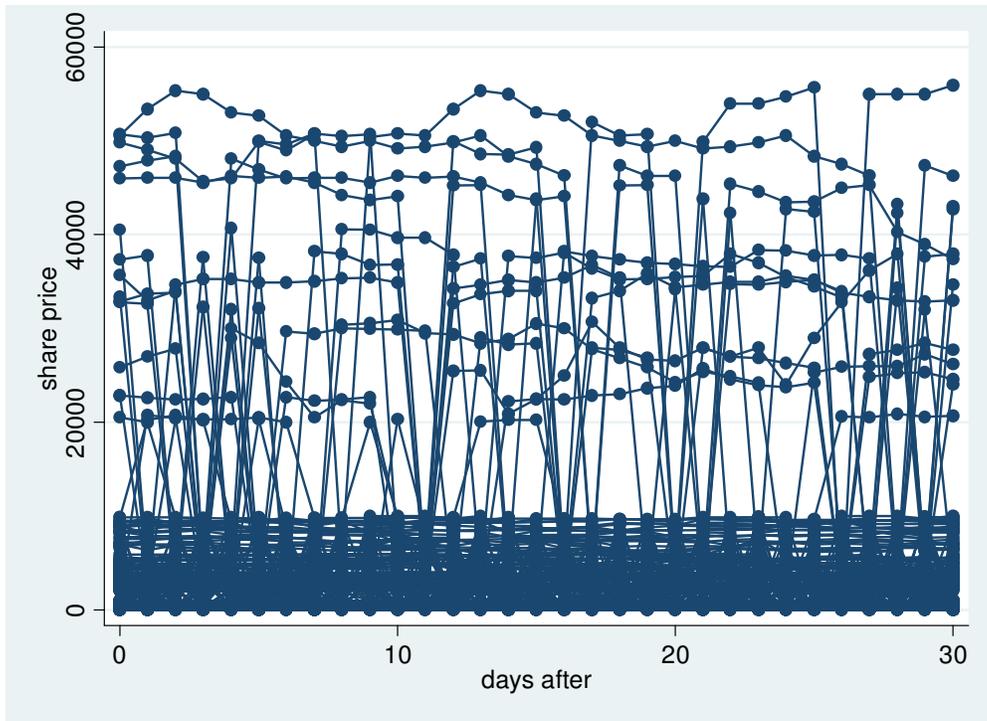
90 Days



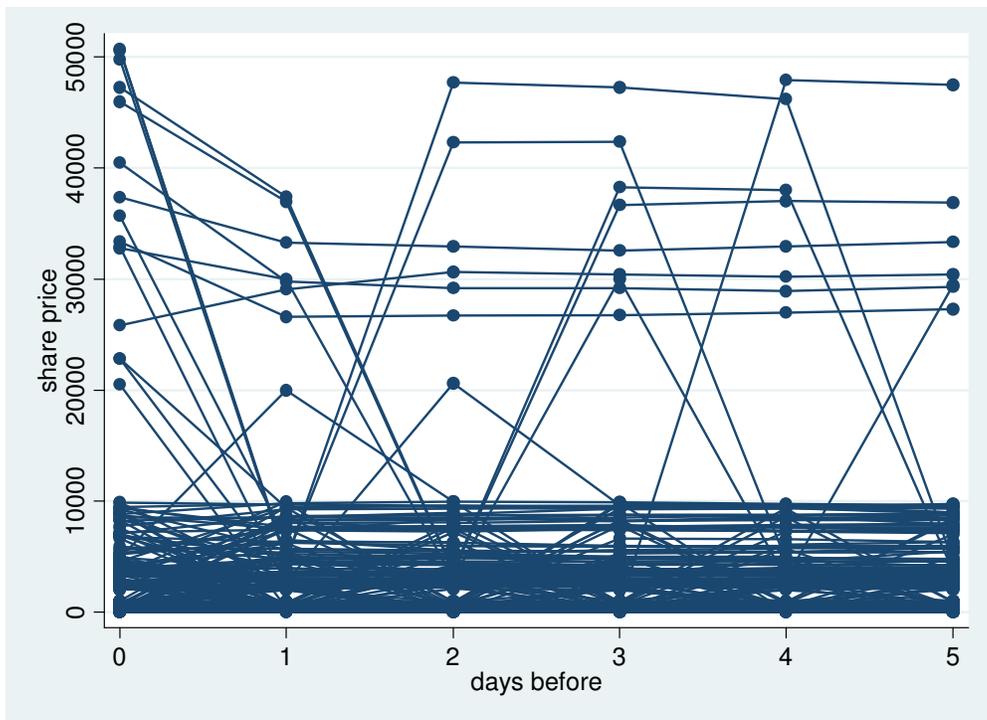


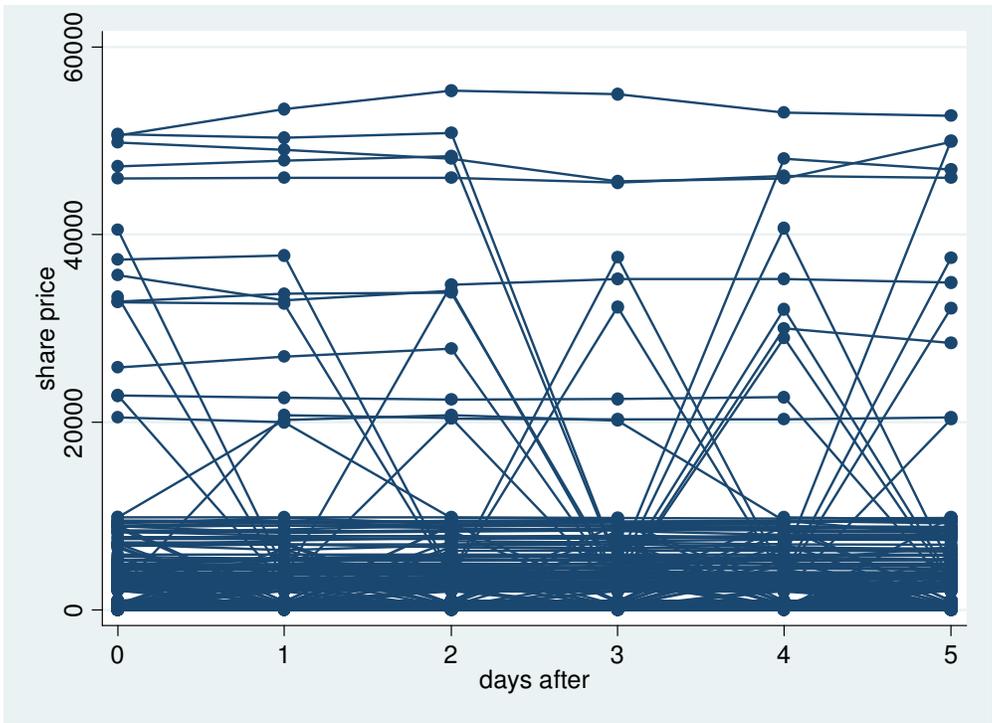
30 Days





5 Days







9.2 Strata outputs

9.2.1 Hypothesis 1:

9.2.1.1 Descriptive Statistics

```
tabstat bef_avg120-aft_avg120, stat(mean sd)
```

```

stats | bef_~120 bef_a~90 bef_a~60 bef_a~30 bef_avg5 aft_avg5
-----+-----
mean | 3343.895 3342.412 3329.987 3176.951 3181.612 3691.002
sd | 5684.138 5811 5883.828 5311.896 5380.078 7217.388
-----+-----

```

```

stats | aft_a~30 aft_a~60 aft_a~90 aft_~120
-----+-----
mean | 3640.23 3491.977 3455.309 3437.755
sd | 6816.32 6167.596 6047.578 6021.913
-----+-----

```

9.2.1.2 Statistical t-test

```

. *! Matched pairs t-test
.
. ttest logaft_avg120=logbef_avg120

```

Paired t test

```

-----+-----
Variable | Obs Mean Std. Err. Std. Dev. [95% Conf. Interval]
-----+-----
loga~120 | 257 7.08489 .1023623 1.640992 6.88331 7.286469
logb~120 | 257 7.012891 .1068354 1.712701 6.802503 7.223279
-----+-----
diff | 257 .0719986 .0369302 .5920367 -.0007271 .1447244
-----+-----

```



```

mean(diff) = mean(logaft_avg120 - logbef_avg120)          t = 1.9496
Ho: mean(diff) = 0                                     degrees of freedom = 256

```

```

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9738         Pr(|T| > |t|) = 0.0523         Pr(T > t) = 0.0262

```

```
. ttest logaft_avg90=logbef_avg90
```

Paired t test

```

-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~90 |      257   7.085043   .1027137   1.646626   6.882772   7.287314
logbe~90 |      257   7.00297    .1065564   1.708229   6.793131   7.212809
-----+-----
diff |      257   .082073    .0396631   .6358473   .0039656   .1601804
-----+-----

```

```

mean(diff) = mean(logaft_avg90 - logbef_avg90)          t = 2.0693
Ho: mean(diff) = 0                                     degrees of freedom = 256

```

```

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9802         Pr(|T| > |t|) = 0.0395         Pr(T > t) = 0.0198

```

```
. ttest logaft_avg60=logbef_avg60
```

Paired t test

```

-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~60 |      257   7.073146   .1035333   1.659766   6.86926   7.277031
logbe~60 |      257   6.976437   .1075501   1.72416   6.764641   7.188233
-----+-----
diff |      257   .0967085   .0451096   .7231625   .0078753   .1855417
-----+-----

```

```

mean(diff) = mean(logaft_avg60 - logbef_avg60)          t = 2.1439
Ho: mean(diff) = 0                                     degrees of freedom = 256

```

```

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9835         Pr(|T| > |t|) = 0.0330         Pr(T > t) = 0.0165

```



```
. ttest logaft_avg30=logbef_avg30
```

Paired t test

```
-----+-----  
Variable | Obs Mean Std. Err. Std. Dev. [95% Conf. Interval]  
-----+-----  
logaf~30 | 257 7.052632 .1057883 1.695915 6.844306 7.260959  
logbe~30 | 257 6.951795 .1083304 1.736668 6.738463 7.165127  
-----+-----  
diff | 257 .1008377 .0519803 .833307 -.0015257 .203201  
-----+-----
```

```
mean(diff) = mean(logaft_avg30 - logbef_avg30) t = 1.9399  
Ho: mean(diff) = 0 degrees of freedom = 256  
  
Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0  
Pr(T < t) = 0.9733 Pr(|T| > |t|) = 0.0535 Pr(T > t) = 0.0267
```

```
. ttest logaft_avg5=logbef_avg5
```

Paired t test

```
-----+-----  
Variable | Obs Mean Std. Err. Std. Dev. [95% Conf. Interval]  
-----+-----  
logaft~5 | 257 6.933286 .117599 1.885255 6.701701 7.16487  
logbef~5 | 257 6.89933 .1130732 1.812702 6.676657 7.122002  
-----+-----  
diff | 257 .0339563 .0701172 1.124064 -.1041236 .1720362  
-----+-----
```

```
mean(diff) = mean(logaft_avg5 - logbef_avg5) t = 0.4843  
Ho: mean(diff) = 0 degrees of freedom = 256  
  
Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0  
Pr(T < t) = 0.6857 Pr(|T| > |t|) = 0.6286 Pr(T > t) = 0.3143
```



9.2.2 Hypothesis 2:

9.2.2.1 Statistical correlation test

```
. *! Correlation between headlinecategorisation and log performance
```

```
. pwcorr headlinecategorisation logaft_avg120, sig
```

```
          | headli~n loga~120  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logaft_a~120 | -0.1408 1.0000  
          | 0.0240  
          |
```

```
. pwcorr headlinecategorisation logbef_avg120, sig
```

```
          | headli~n logb~120  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logbef_a~120 | -0.0724 1.0000  
          | 0.2478  
          |
```

```
.
```

```
. pwcorr headlinecategorisation logaft_avg90, sig
```

```
          | headli~n logaf~90  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logaft_avg90 | -0.1495 1.0000  
          | 0.0165  
          |
```



```
. pwcorr headlinecategorisation logbef_avg90, sig
```

```
          | headli~n logbe~90  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logbef_avg90 | -0.0763 1.0000  
          | 0.2229  
          |
```

.

```
. pwcorr headlinecategorisation logaft_avg60, sig
```

```
          | headli~n logaf~60  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logaft_avg60 | -0.1606 1.0000  
          | 0.0099  
          |
```

```
. pwcorr headlinecategorisation logbef_avg60, sig
```

```
          | headli~n logbe~60  
-----+-----  
headlineca~n | 1.0000  
          |  
          |  
logbef_avg60 | -0.0856 1.0000  
          | 0.1711  
          |
```

.

```
. pwcorr headlinecategorisation logaft_avg30, sig
```

```
          | headli~n logaf~30  
-----+-----
```



```
headlineca~n | 1.0000
|
|
```

```
logaft_avg30 | -0.1781 1.0000
| 0.0042
|
```

```
. pwcorr headlinecategorisation logbef_avg30, sig
```

```
          | headli~n logbe~30
-----+-----
headlineca~n | 1.0000
|
|
logbef_avg30 | -0.0843 1.0000
| 0.1778
|
```

```
.
```

```
. pwcorr headlinecategorisation logaft_avg5, sig
```

```
          | headli~n logaft~5
-----+-----
headlineca~n | 1.0000
|
|
logaft_avg5 | -0.1785 1.0000
| 0.0041
|
```

```
. pwcorr headlinecategorisation logbef_avg5, sig
```

```
          | headli~n logbef~5
-----+-----
headlineca~n | 1.0000
logbef_avg5 | -0.0975 1.0000
| 0.1188
```



9.2.2.2 Category 1 - Very Positive paired t test

9.2.2.2.1 120 days before and after the announcement

```
. ttest logaft_avg120=logbef_avg120 if headlinecategorisation==1
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
loga~120	72	7.146805	.178709	1.516396	6.790469	7.50314
logb~120	72	7.009662	.1812398	1.537871	6.64828	7.371044
diff	72	.1371422	.0692461	.5875724	-.0009305	.275215

mean(diff) = mean(logaft_avg120 - logbef_avg120) t = 1.9805
 Ho: mean(diff) = 0 degrees of freedom = 71

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
 Pr(T < t) = 0.9742 Pr(|T| > |t|) = 0.0515 Pr(T > t) = 0.0258

9.2.2.2.2 90 days before and after the announcement

```
. ttest logaft_avg90=logbef_avg90 if headlinecategorisation==1
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~90	72	7.147034	.181076	1.536481	6.785979	7.50809
logbe~90	72	7.005799	.1806297	1.532694	6.645634	7.365965
diff	72	.1412348	.0767578	.6513117	-.011816	.2942855

mean(diff) = mean(logaft_avg90 - logbef_avg90) t = 1.8400
 Ho: mean(diff) = 0 degrees of freedom = 71



Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9650 Pr(|T| > |t|) = 0.0699 Pr(T > t) = 0.0350

9.2.2.2.3 60 days before and after the announcement

. ttest logaft_avg60=logbef_avg60 if headlinecategorisation==1

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	72	7.15818	.1836574	1.558385	6.791978	7.524383
logbe~60	72	7.005619	.1803143	1.530017	6.646083	7.365156
diff	72	.1525608	.0781046	.6627395	-.0031754	.3082969

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = 1.9533
Ho: mean(diff) = 0 degrees of freedom = 71
Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9726 Pr(|T| > |t|) = 0.0547 Pr(T > t) = 0.0274

9.2.2.2.4 30 days before and after the announcement

. ttest logaft_avg30=logbef_avg30 if headlinecategorisation==1

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~30	72	7.191033	.1908403	1.619334	6.810508	7.571558
logbe~30	72	7.003269	.1767563	1.499827	6.650827	7.355711
diff	72	.1877636	.0892671	.7574568	.00977	.3657572

mean(diff) = mean(logaft_avg30 - logbef_avg30) t = 2.1034
Ho: mean(diff) = 0 degrees of freedom = 71



Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
 Pr(T < t) = 0.9805 Pr(|T| > |t|) = 0.0390 Pr(T > t) = 0.0195

9.2.2.2.5 5 days before and after the announcement

. ttest logaft_avg5=logbef_avg5 if headlinecategorisation==1

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaft~5	72	7.112415	.2136043	1.812492	6.686501	7.53833
logbef~5	72	6.982695	.1812114	1.53763	6.62137	7.34402
diff	72	.1297205	.1268786	1.076601	-.1232682	.3827093

mean(diff) = mean(logaft_avg5 - logbef_avg5) t = 1.0224
 Ho: mean(diff) = 0 degrees of freedom = 71

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
 Pr(T < t) = 0.8450 Pr(|T| > |t|) = 0.3101 Pr(T > t) = 0.1550



9.2.2.3 Category 2 - Positive/Optimistic paired t test

9.2.2.3.1 120 days before and after the announcement

```
. ttest logaft_avg120=logbef_avg120 if headlinecategorisation==2
```

Paired t test

```
-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
loga~120 |       95   7.328915   .149074    1.452993    7.032925    7.624905
logb~120 |       95   7.203346   .1695648   1.652714    6.866671    7.540021
-----+-----
      diff |       95   .1255691   .0623967   .6081682   .0016789   .2494593
-----+-----

      mean(diff) = mean(logaft_avg120 - logbef_avg120)          t =      2.0124
Ho: mean(diff) = 0                      degrees of freedom =      94

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9765          Pr(|T| > |t|) = 0.0470          Pr(T > t) = 0.0235
```

9.2.2.3.2 90 days before and after the announcement

```
. ttest logaft_avg90=logbef_avg90 if headlinecategorisation==2
```

Paired t test

```
-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~90 |       95   7.342774   .1474187   1.43686    7.050071    7.635477
logbe~90 |       95   7.191868   .1683993   1.641354    6.857507    7.526229
-----+-----
      diff |       95   .1509059   .063565    .6195553   .024696    .2771158
-----+-----

      mean(diff) = mean(logaft_avg90 - logbef_avg90)          t =      2.3740
Ho: mean(diff) = 0                      degrees of freedom =      94
```



Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9902 Pr(|T| > |t|) = 0.0196 Pr(T > t) = 0.0098

9.2.2.3.3 60 days before and after the announcement

. ttest logaft_avg60=logbef_avg60 if headlinecategorisation==2

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	95	7.33333	.1481843	1.444322	7.039107	7.627553
logbe~60	95	7.164428	.1682138	1.639545	6.830435	7.49842
diff	95	.1689023	.0771036	.7515129	.0158113	.3219933

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = 2.1906
Ho: mean(diff) = 0 degrees of freedom = 94

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9845 Pr(|T| > |t|) = 0.0310 Pr(T > t) = 0.0155

9.2.2.3.4 30 days before and after the announcement

. ttest logaft_avg30=logbef_avg30 if headlinecategorisation==2

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~30	95	7.314433	.14799	1.442428	7.020596	7.608271
logbe~30	95	7.116591	.1720485	1.676921	6.774985	7.458197
diff	95	.1978423	.0888549	.8660506	.0214188	.3742658



```

mean(diff) = mean(logaft_avg30 - logbef_avg30)          t = 2.2266
Ho: mean(diff) = 0                                     degrees of freedom = 94

Ha: mean(diff) < 0          Ha: mean(diff) != 0        Ha: mean(diff) > 0
Pr(T < t) = 0.9858         Pr(|T| > |t|) = 0.0284      Pr(T > t) = 0.0142

```

9.2.2.3.5 5 days before and after the announcement

```
. ttest logaft_avg5=logbef_avg5 if headlinecategorisation==2
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaft~5	95	7.204936	.1613175	1.572328	6.884636	7.525236
logbef~5	95	7.09264	.1811237	1.765376	6.733015	7.452265
diff	95	.1122961	.1227571	1.196488	-.131441	.3560332

```

mean(diff) = mean(logaft_avg5 - logbef_avg5)          t = 0.9148
Ho: mean(diff) = 0                                     degrees of freedom = 94

Ha: mean(diff) < 0          Ha: mean(diff) != 0        Ha: mean(diff) > 0
Pr(T < t) = 0.8187         Pr(|T| > |t|) = 0.3626      Pr(T > t) = 0.1813

```




Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9831 Pr(|T| > |t|) = 0.0338 Pr(T > t) = 0.0169

9.2.2.4.3 60 days before and after the announcement

. ttest logaft_avg60=logbef_avg60 if headlinecategorisation==3

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	19	7.298533	.3528	1.53782	6.557328	8.039738
logbe~60	19	6.994404	.3538629	1.542452	6.250966	7.737842
diff	19	.304129	.1369679	.597029	.0163702	.5918878

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = 2.2204
Ho: mean(diff) = 0 degrees of freedom = 18

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9803 Pr(|T| > |t|) = 0.0395 Pr(T > t) = 0.0197

9.2.2.4.4 30 days before and after the announcement

. ttest logaft_avg30=logbef_avg30 if headlinecategorisation==3

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~30	19	7.25856	.3911606	1.70503	6.436762	8.080358
logbe~30	19	6.957639	.3835441	1.67183	6.151843	7.763435
diff	19	.3009212	.1647024	.7179212	-.0451058	.6469481



```

mean(diff) = mean(logaft_avg30 - logbef_avg30)          t = 1.8271
Ho: mean(diff) = 0                                     degrees of freedom = 18

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9578          Pr(|T| > |t|) = 0.0843          Pr(T > t) = 0.0422

```

9.2.2.4.5 5 days before and after the announcement

```
. ttest logaft_avg5=logbef_avg5 if headlinecategorisation==3
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaft~5	19	7.094562	.5118405	2.231061	6.019225	8.169899
logbef~5	19	6.75898	.4361399	1.90109	5.842685	7.675276
diff	19	.3355819	.2119741	.9239739	-.1097593	.780923

```

mean(diff) = mean(logaft_avg5 - logbef_avg5)          t = 1.5831
Ho: mean(diff) = 0                                     degrees of freedom = 18

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9346          Pr(|T| > |t|) = 0.1308          Pr(T > t) = 0.0654

```



9.2.2.5 Category 4 – Negative paired t test

9.2.2.5.1 120 days before and after the announcement

```
. ttest logaft_avg120=logbef_avg120 if headlinecategorisation==4
```

Paired t test

```
-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
loga~120 |       50   6.754372   .2756001   1.948787   6.200533   7.308211
logb~120 |       50   6.783183   .2827036   1.999016   6.215069   7.351297
-----+-----
      diff |       50  -.0288113   .0766013   .5416528  -.1827473   .1251247
-----+-----

      mean(diff) = mean(logaft_avg120 - logbef_avg120)          t =  -0.3761
Ho: mean(diff) = 0                      degrees of freedom =      49

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.3542          Pr(|T| > |t|) = 0.7085          Pr(T > t) = 0.6458
```

9.2.2.5.2 90 days before and after the announcement

```
. ttest logaft_avg90=logbef_avg90 if headlinecategorisation==4
```

Paired t test

```
-----+-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~90 |       50   6.733398   .2787571   1.971111   6.173215   7.293581
logbe~90 |       50   6.763356   .2835626   2.00509   6.193372   7.3334
-----+-----
      diff |       50  -.0301618   .0860162   .6082265  -.2030179   .1426942
-----+-----

      mean(diff) = mean(logaft_avg90 - logbef_avg90)          t =  -0.3507
Ho: mean(diff) = 0                      degrees of freedom =      49
```



Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.3637 Pr(|T| > |t|) = 0.7274 Pr(T > t) = 0.6363

9.2.2.5.3 60 days before and after the announcement

```
. ttest logaft_avg60=logbef_avg60 if headlinecategorisation==4
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	50	6.703354	.2803806	1.98259	6.139908	7.2668
logbe~60	50	6.70619	.2902428	2.052327	6.122925	7.289455
diff	50	-.002836	.1020511	.7216106	-.2079155	.2022434

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = -0.0278

Ho: mean(diff) = 0 degrees of freedom = 49

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.4890 Pr(|T| > |t|) = 0.9779 Pr(T > t) = 0.5110

9.2.2.5.4 30 days before and after the announcement

```
. ttest logaft_avg30=logbef_avg30 if headlinecategorisation==4
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~30	50	6.617598	.2804761	1.983265	6.05396	7.181235
logbe~30	50	6.686484	.291024	2.05785	6.101649	7.271318
diff	50	-.068886	.1151749	.8144094	-.3003386	.1625665



```

mean(diff) = mean(logaft_avg30 - logbef_avg30)          t = -0.5981
Ho: mean(diff) = 0                                     degrees of freedom = 49

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.2763          Pr(|T| > |t|) = 0.5525          Pr(T > t) = 0.7237

```

9.2.2.5.5 5 days before and after the announcement

```
. ttest logaft_avg5=logbef_avg5 if headlinecategorisation==4
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaft~5	50	6.471197	.3036142	2.146876	5.861061	7.081332
logbef~5	50	6.601145	.3009325	2.127914	5.996399	7.205892
diff	50	-.1299482	.1422396	1.005786	-.4157894	.155893

```

mean(diff) = mean(logaft_avg5 - logbef_avg5)          t = -0.9136
Ho: mean(diff) = 0                                     degrees of freedom = 49

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.1827          Pr(|T| > |t|) = 0.3654          Pr(T > t) = 0.8173

```



9.2.2.6 Category 5 - Very Negative paired t test

9.2.2.6.1 120 days before and after the announcement

```
. ttest logaft_avg120=logbef_avg120 if headlinecategorisation==5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
loga~120	21	6.410938	.4276993	1.959965	5.518773	7.303103
logb~120	21	6.723829	.4453128	2.040679	5.794923	7.652736
diff	21	-.3128914	.1268155	.5811417	-.5774239	-.0483589

```

mean(diff) = mean(logaft_avg120 - logbef_avg120)          t = -2.4673
Ho: mean(diff) = 0                                         degrees of freedom = 20

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.0114          Pr(|T| > |t|) = 0.0228          Pr(T > t) = 0.9886

```

9.2.2.6.2 90 days before and after the announcement

```
. ttest logaft_avg90=logbef_avg90 if headlinecategorisation==5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~90	21	6.347886	.4225781	1.936496	5.466404	7.229369
logbe~90	21	6.691989	.4462043	2.044765	5.761223	7.622755
diff	21	-.3441026	.1397037	.6402027	-.6355194	-.0526859

```
mean(diff) = mean(logaft_avg90 - logbef_avg90)          t = -2.4631
```



Ho: mean(diff) = 0 degrees of freedom = 20

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.0115 Pr(|T| > |t|) = 0.0230 Pr(T > t) = 0.9885

9.2.2.6.3 60 days before and after the announcement

. ttest logaft_avg60=logbef_avg60 if headlinecategorisation==5

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	21	6.281109	.4186653	1.918565	5.407789	7.15443
logbe~60	21	6.653141	.4462589	2.045015	5.722261	7.584021
diff	21	-.3720315	.1620356	.7425402	-.7100317	-.0340312

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = -2.2960

Ho: mean(diff) = 0 degrees of freedom = 20

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.0163 Pr(|T| > |t|) = 0.0326 Pr(T > t) = 0.9837

9.2.2.6.4 30 days before and after the announcement

. ttest logaft_avg30=logbef_avg30 if headlinecategorisation==5

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~30	21	6.24326	.4297174	1.969212	5.346885	7.139634
logbe~30	21	6.656208	.4421645	2.026252	5.733869	7.578547
diff	21	-.4129482	.1925219	.882246	-.8145418	-.0113547



```

mean(diff) = mean(logaft_avg30 - logbef_avg30)          t = -2.1449
Ho: mean(diff) = 0                                     degrees of freedom = 20

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.0222          Pr(|T| > |t|) = 0.0444          Pr(T > t) = 0.9778

```

9.2.2.6.5 5 days before and after the announcement

```
. ttest logaft_avg5=logbef_avg5 if headlinecategorisation==5
```

Paired t test

```

-----
Variable |      Obs      Mean   Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaft~5 |        21   6.044529   .467307    2.14147    5.069744    7.019314
logbef~5 |        21   6.575952   .4428579   2.02943    5.652167    7.499737
-----+-----
diff |        21  -.5314232   .2700732   1.237631  -1.094786    .0319397
-----

```

```

mean(diff) = mean(logaft_avg5 - logbef_avg5)          t = -1.9677
Ho: mean(diff) = 0                                     degrees of freedom = 20

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.0316          Pr(|T| > |t|) = 0.0631          Pr(T > t) = 0.9684

```



9.2.3 Hypothesis 3:

9.2.3.1 Statistical matched pairs test

```
. *! Categorize analysis as to high and low market cap
. *! Using
. *! matched pairs test
. ttest logaft_avg120=logbef_avg120 if marketcaprb < 5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
loga~120	128	6.174337	.1388623	1.571048	5.899553	6.44912
logb~120	128	6.097389	.146172	1.653747	5.808141	6.386637
diff	128	.0769472	.0550605	.6229385	-.0320076	.185902

```
mean(diff) = mean(logaft_avg120 - logbef_avg120)          t = 1.3975
Ho: mean(diff) = 0                                         degrees of freedom = 127

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9177          Pr(|T| > |t|) = 0.1647          Pr(T > t) = 0.0823
```

```
. ttest logaft_avg120=logbef_avg120 if marketcaprb >= 5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
loga~120	129	7.988384	.0998067	1.133586	7.7909	8.185869
logb~120	129	7.921296	.107234	1.217944	7.709115	8.133476
diff	129	.0670884	.0494893	.5620903	-.0308346	.1650114

```
mean(diff) = mean(logaft_avg120 - logbef_avg120)          t = 1.3556
Ho: mean(diff) = 0                                         degrees of freedom = 128

Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
```



Pr(T < t) = 0.9112 Pr(|T| > |t|) = 0.1776 Pr(T > t) = 0.0888

.

. ttest logaft_avg90=logbef_avg90 if marketcaprb < 5

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~90	128	6.166591	.1386309	1.56843	5.892265	6.440916
logbe~90	128	6.101972	.145617	1.647468	5.813822	6.390122
diff	128	.0646185	.0595446	.67367	-.0532094	.1824465

mean(diff) = mean(logaft_avg90 - logbef_avg90) t = 1.0852

Ho: mean(diff) = 0 degrees of freedom = 127

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.8601 Pr(|T| > |t|) = 0.2799 Pr(T > t) = 0.1399

. ttest logaft_avg90=logbef_avg90 if marketcaprb >= 5

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~90	129	7.996376	.1004419	1.140801	7.797634	8.195117
logbe~90	129	7.896983	.1087577	1.23525	7.681788	8.112179
diff	129	.0993921	.0526588	.5980894	-.0048024	.2035866

mean(diff) = mean(logaft_avg90 - logbef_avg90) t = 1.8875

Ho: mean(diff) = 0 degrees of freedom = 128

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0

Pr(T < t) = 0.9693 Pr(|T| > |t|) = 0.0614 Pr(T > t) = 0.0307

.

.



```
. ttest logaft_avg60=logbef_avg60 if marketcaprb < 5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	128	6.137393	.1375411	1.5561	5.865224	6.409562
logbe~60	128	6.086834	.1480624	1.675135	5.793845	6.379822
diff	128	.0505595	.0688422	.7788601	-.0856667	.1867857

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = 0.7344
Ho: mean(diff) = 0 degrees of freedom = 127

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.7680 Pr(|T| > |t|) = 0.4640 Pr(T > t) = 0.2320

```
. ttest logaft_avg60=logbef_avg60 if marketcaprb >= 5
```

Paired t test

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
logaf~60	129	8.001644	.1027769	1.167321	7.798283	8.205006
logbe~60	129	7.859144	.1108335	1.258827	7.639841	8.078448
diff	129	.1424998	.0583893	.6631751	.0269666	.258033

mean(diff) = mean(logaft_avg60 - logbef_avg60) t = 2.4405
Ho: mean(diff) = 0 degrees of freedom = 128

Ha: mean(diff) < 0 Ha: mean(diff) != 0 Ha: mean(diff) > 0
Pr(T < t) = 0.9920 Pr(|T| > |t|) = 0.0160 Pr(T > t) = 0.0080

```
.  
.
```

```
. ttest logaft_avg30=logbef_avg30 if marketcaprb < 5
```

Paired t test



```
-----+-----
Variable |      Obs      Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~30 |      128    6.109133    .139714    1.580683    5.832664    6.385602
logbe~30 |      128    6.083844    .1518327    1.71779    5.783394    6.384293
-----+-----
diff |      128    .0252895    .0762254    .8623923   -.1255469    .1761259
-----+-----
```

```
mean(diff) = mean(logaft_avg30 - logbef_avg30)          t =    0.3318
Ho: mean(diff) = 0                                     degrees of freedom =    127
```

```
Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.6297          Pr(|T| > |t|) = 0.7406          Pr(T > t) = 0.3703
```

```
. ttest logaft_avg30=logbef_avg30 if marketcaprb >= 5
```

Paired t test

```
-----+-----
Variable |      Obs      Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
logaf~30 |      129    7.988818    .1078234    1.224638    7.775471    8.202165
logbe~30 |      129    7.813018    .1114889    1.26627    7.592418    8.033617
-----+-----
diff |      129    .1758002    .0704097    .7996999    .0364827    .3151178
-----+-----
```

```
mean(diff) = mean(logaft_avg30 - logbef_avg30)          t =    2.4968
Ho: mean(diff) = 0                                     degrees of freedom =    128
```

```
Ha: mean(diff) < 0          Ha: mean(diff) != 0          Ha: mean(diff) > 0
Pr(T < t) = 0.9931          Pr(|T| > |t|) = 0.0138          Pr(T > t) = 0.0069
```

```
.
.
. ttest logaft_avg5=logbef_avg5 if marketcaprb < 5
```

Paired t test

```
-----+-----
Variable |      Obs      Mean    Std. Err.   Std. Dev.   [95% Conf. Interval]
-----+-----
```




9.2.4 Hypothesis 4:

9.2.4.1 Anova test

*! Link between sector and performance

```
. oneway logbef_avg120 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	151.883139	18	8.43795217	3.35	0.0000
Within groups	599.053119	238	2.51702991		
Total	750.936258	256	2.93334476		

Bartlett's test for equal variances: $\chi^2(18) = 31.7979$ Prob> $\chi^2 = 0.023$

```
. oneway logaft_avg120 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	134.504667	18	7.4724815	3.21	0.0000
Within groups	554.866498	238	2.33137184		
Total	689.371165	256	2.69285611		

Bartlett's test for equal variances: $\chi^2(18) = 44.5755$ Prob> $\chi^2 = 0.000$

```
. oneway logbef_avg90 sector
```

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	148.997583	18	8.27764348	3.29	0.0000
Within groups	598.022034	238	2.51269762		
Total	747.019616	256	2.91804538		



Bartlett's test for equal variances: $\chi^2(18) = 29.4742$ Prob> $\chi^2 = 0.043$

. oneway logaft_avg90 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	131.096102	18	7.28311679	3.08	0.0000
Within groups	563.016101	238	2.36561387		
Total	694.112203	256	2.71137579		

Bartlett's test for equal variances: $\chi^2(18) = 44.8576$ Prob> $\chi^2 = 0.000$

. oneway logbef_avg60 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	154.529679	18	8.58498217	3.37	0.0000
Within groups	606.488284	238	2.5482701		
Total	761.017963	256	2.97272642		

Bartlett's test for equal variances: $\chi^2(18) = 31.8799$ Prob> $\chi^2 = 0.023$

. oneway logaft_avg60 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	128.15152	18	7.11952891	2.94	0.0001
Within groups	577.08303	238	2.42471861		
Total	705.234551	256	2.75482246		

Bartlett's test for equal variances: $\chi^2(18) = 41.7472$ Prob> $\chi^2 = 0.001$

. oneway logbef_avg30 sector



Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	147.097872	18	8.17210401	3.11	0.0000
Within groups	625.001914	238	2.62605846		
Total	772.099787	256	3.01601479		

Bartlett's test for equal variances: $\chi^2(18) = 30.9957$ Prob> $\chi^2 = 0.029$

. oneway logaft_avg30 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	137.191531	18	7.62175173	3.03	0.0001
Within groups	599.097497	238	2.51721637		
Total	736.289028	256	2.87612902		

Bartlett's test for equal variances: $\chi^2(18) = 44.8199$ Prob> $\chi^2 = 0.000$

. oneway logbef_avg5 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
Between groups	156.019591	18	8.66775504	3.01	0.0001
Within groups	685.167517	238	2.87885512		
Total	841.187108	256	3.28588714		

Bartlett's test for equal variances: $\chi^2(18) = 29.8772$ Prob> $\chi^2 = 0.039$

. oneway logaft_avg5 sector

Analysis of Variance

Source	SS	df	MS	F	Prob > F
--------	----	----	----	---	----------



Between groups	134.949581	18	7.49719896	2.30	0.0025
Within groups	774.921846	238	3.25597414		

Total	909.871427	256	3.55418526		

Bartlett's test for equal variances: $\chi^2(18) = 52.6454$ Prob> $\chi^2 = 0.$



10 Appendix B – Business Day Newspaper

Monday



Greta Steyn

How conspiracy theories affect the markets
Page 9



Enterprise

Getting the foundation right
Page 10



Old Mutual

Putting the brakes on a \$3.6bn spree
Page 11

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BUSINESS DAY



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Monday, April 30 2001

with the FINANCIAL TIMES worldwide

TWENTY-FOUR HOURS

News

Plans for parastatal
GOVERNMENT plans to create a new parastatal institution to provide medium- and long-term export credit and foreign investment insurance cover, thereby ending the long involvement of the Credit Guarantee Insurance Corporation in this market. The corporation is wholly owned by the major banks, reinsurers and insurance companies and has acted as government's agent for more than 40 years. Page 9

Harare beats retreat
PRESIDENT Robert Mugabe's government appeared to be in retreat yesterday after international outrage over its

Business

GERMAN aviation group Lufthansa poured cold water on suggestions that it might buy the 25% stake of SA Airways (SAA) which is held by the troubled Swiss group Swissair. Lufthansa chairman and CEO Jürgen Weber told hundreds of analysts and journalists at its annual conference on Friday that Lufthansa was happy with the purely commercial relationship it had with SAA. Page 11

WHEN Swissair Group shareholders voted for the sale of an outside audit into what went wrong at the troubled airline, it no doubt sent shudders through boardrooms in continental Europe last week. Page 14

Eskom gives phone plans green light

Telecommunications backbone, which will cost R1,5bn, will be operational by May next year

Robyn Chalmers

ESKOM has approved plans to build a full telecommunications backbone to be

apart from converting power lines, cover said Eskom had already had radio systems, microwave channel capacity, voice and data networks.



The stage and crowds at Trafalgar Square in London yesterday, seconds before the start of the SA Freedom Day Concert on The Square. Former SA president Nelson Mandela and British Prime Minister Tony Blair were due to attend. Page 10

Thursday



IT

Action needed to bridge the digital divide
Page 5



Teba

Leading the mining industry's drive to uplift rural poor
Page 9



The Bottom Line

Sasol's best investment yet
Page 11

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BUSINESS DAY



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News

Numsa goes to war
THE National Union of Metalworkers of SA (Numsa) is preparing itself for a "tough" first round of negotiations with employers in the steel, motor and engineering industries. Numsa, which has already declared "war", warned that failure to reach settlement with industry capitalists could result in mass action. The union has 220 000 members. Page 3

Kabila murder 'plotted'
REBEL forces in Democratic Republic of Congo and their allies, Uganda and Rwanda, organised the murder of their president Laurent Kabila in January, a panel said. Page 6

Business

SA AIRWAYS' inability to send home foreign currency worth 23% from Zimbabwe because of an acute shortage of hard currency was hampering its operations in Zimbabwe, SAA executive vice-president Bronco Mokoabe said yesterday. Mokoabe, in Zimbabwe to try to find ways to repatriate the money, also urged the government to ensure a stable economic and political climate to help foreign companies.

SA's largest financial services organisation, Alexander Forbes, has reported the high growth rate and profitability, boasting attributable headline profit for the year to the end of March 33% to R420m. Page 12

Government to rescue Post Office

A R500m lifeline may be provided, reversing a decision to end postal subsidies in March

Robyn Chalmers and Vuyo Moko

R1,5bn, when government terminated the subsidy in the wake of the agreement with Transnet Worldwide.



Johannes CEO Paul Edwisch, left, and Johannes financial and administration director Jacob Modise at the announcement in Johannesburg yesterday of the group's unbundling plan. The plan will result in Johannes Communications becoming a media and entertainment listing, leaving Johannes Holdings as a holding company of the group's M-Cell stake. See Page 11

MARKET MASTER

WE IDENTIFY the leading players
One player in Business Day's R50 000 Market Master game has given the value of his portfolio by a whopping 17% in the 14 days since the competition began. Several others have seen their portfolios grow more than 20%. As of yesterday, the three leading players were: 1) Wayne Hindmarsh, Roadpoint, up 21,4% 2) Nelson Geric, Johannesburg, up 20,1% 3) Tinas Cloos-Pave, Sandton, Gusting, up 21,7%
Remember, entries don't close until June 4 and trading is open till July 13. You can buy and sell any shares listed on the JSE up to that date, although — as in the real world — unusually large orders may not always be filled immediately.