

Media Coverage and the Cross Section of Stock Returns

A Probe into the JSE



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Abstract

Through reaching a wide-ranging population of investors, both institutional and individual, mass media coverage of stocks markets can alleviate financial information frictions and consequently affect the valuation of securities even when it does not present genuine news. The empirical objective of this research is to investigate this hypothesis by studying media reporting and changes in average stock returns. By constructing two portfolios of stocks divided into “stocks without media coverage” and “stocks with media coverage” an investigation can be carried to find out which portfolio outperforms the other and sometimes even after accounting for risk factors. Previous literature news media and the stock market has failed to address African financial markets including the Johannesburg stock exchange (JSE) market. The Johannesburg stock exchange is Africa’s oldest and largest stock market. An opportunity exists to replicate empirical work on news media reporting and changes in average returns in South Africa and Johannesburg stock exchange.

The methodology employed in this study is adopted from the widespread research previously conducted in other more developed markets. Media coverage has been derived from the number of headline articles about a stock in a certain month in 23 influential South African print newspapers. Only headline articles are used to proxy for a stocks overall media attention. A systematic search of the LexisNexis database is carried out to find articles published in 23 major, influential newspapers in South Africa. The examination period is from 1 January 2013 to 31 December 2017 (a total of 7620 firm-month observations).

The results indicate no statistically significant (at the 95% confidence level) outperformance of stocks without any news media reporting over stocks with news media reporting as found in more developed markets. Further analysis of data indicates that media reporting of the JSE stocks is surprisingly low and 99% of observations having only 6 headlines or less in the media. Therefore, about 1% of the observations are reported at least 7 times in the South African newspaper media.

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Abbreviations

CAPM	Capital Asset Pricing Model
EMH	Efficient Market Hypothesis
JIBAR	Johannesburg Interbank Average Rate
JSE	Johannesburg Stock Exchange
McG/BFA	McGregor's/Bureau of Financial Analysis
NAV	Net Asset Value
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-operation and Development
P/E	Price/Earnings
S&P	Standard and Poor's
SEC	Securities and Exchange Commission
WSJ	Wall Street Journal

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1 Introduction

News media plays an increasingly important role in dispersing financial information to a wide-ranging audience, especially individual investors in South Africa. There are 22 daily newspapers, 525 business-to-business publications, 470 magazines, 500 community newspapers and 27 weeklies in South Africa (Omnicom Media Group Foundation, 2018). Considering the newspapers websites, social media feeds and online subscriptions, the actual coverage of the print media is even wider. International news networks such as Bloomberg, BBC, CNN, CBS, Huffington Post and Reuters have bureaux in Johannesburg while CNBC Africa was set up in 2007 in South Africa. Business Day television channel was also set up in 2013 focusing on the coverage of the local Johannesburg stock exchange (JSE) market.

Given such reportage, can good mass media coverage (or the lack of) be a determinant of good stock performance? A growing body of research is exploring this relatively new field of news media reporting on the stock price. In one such study Klibanoff *et al.* (1998) indicate that major news stories pertinent to specific countries covered on New York Times newspaper affect the valuation of closed-end funds. Along a similar line, Weston *et al.* (2004) report that companies that devote higher funds to advertising, *ceteris paribus*, have additional liquidity in their stock than those firms with less advertising expenditures. This advertising-effect is found to be higher on individuals than institutions. This finding is also supported by Subrahmanyam and Frieder (2005) who reported that economic agents such as investors, will more likely purchase shares with stronger brand recognition than not. While such studies have been conducted by many authors, this problem is still insufficiently explored especially for developing markets like South Africa.

This study is based on a paper by Fang and Peress (2009) who investigate the underperformance of stocks with news media reporting to stocks with no news media reporting. Utilising a sample of all New York Stock Exchange and NASDAQ firms, the researchers derive a time series of these stocks and their specific media attention from *The Wall Street Journal*, *The New York Times*, *USA Today* and *Washington Post*

For each month from 1 January 1993 to 31 December 2002 (9 years), they divide stocks into portfolios of those with media attention and those without any news media attention. Firms with media attention are split into low-newspaper reporting and high-newspaper reporting stocks based on the median of groups media coverage. A long/short strategy is employed to buy no-newspaper coverage portfolio and short high-newspaper coverage portfolio.

The results are profound! Stocks without any newspaper attention earn 1.35% per month on average while those with newspaper attention earn 0.96%. This difference (i.e. 1.35% *minus* 0.96%) equals 0.39% per month or an economically significant return of 4.8% per annum. Again, low-media covered stocks return more than high-media covered stocks with 1.11% per month. The long/short portfolio delivers an economically significant CAPM alpha of 45 basis points or 23 basis points when adjusting for book-market, size and other risk factors. This “no-media coverage” return premium is more enunciated for small stocks, illiquid and those with less institutional ownership and more unsystematic risks. In such segments, CAPM alpha ranges from 8% to 12% per annum.

To examine that the “no-newspaper attention” return premium is not driven by IPOs, earnings announcement drift (as argued by Tetlock, 2010 and Chan, 2003) or sector bias, the researchers excluded outliers in terms of IPO stocks and earnings-announcements related media coverage. Another outlier adjusted for in the data sample is stocks in the technology sector with unprecedented growth usually followed by a dramatic fall in value.

The authors conclude with several suggestions to explain these results: firstly, firms with lower newspaper reporting tend to have higher average returns to compensate investors for the undiversifiable idiosyncratic risks. Secondly, because of inadequate market liquidity, the no-media coverage return premium is not arbitrated away. One other interesting implication of the results is on the conundrum of stock returns and idiosyncratic risks i.e. why stocks with high idiosyncratic volatility have lower returns. In order to clarify this, the researchers categorize stocks into media coverage and idiosyncratic volatility. This analysis shows that volatility leads to lower average returns in high-media coverage category, but higher average returns in no-media coverage category suggesting a strong correlation between volatility and stocks that enjoy good mass media coverage.

An opportunity exists to replicate empirical work on newspaper reporting and changes in average stock returns in South Africa and the JSE. The JSE is an interesting context considering the South African news media in its developing phase and South Africa as an emerging market economy with less efficiency and liquidity in its financial markets than NYSE and NASDAQ often featured in media coverage and stock market research. Also, this research contributes to the exciting literature on newspaper reporting and stock returns especially since it is the first of its kind conducted in the African context. Research on the effect of newspaper coverage on the share price has failed to investigate emerging market economies

and especially South Africa. Notwithstanding, there is scant literature on media reporting and share returns.

An analysis of the relevant literature in Section 2 will evaluate both the strengths and weaknesses of the literature on media coverage and stock returns while also considering both the agreements and disagreements on the research area. Section 3 will lay out research questions and methodology derived with the guidance of the literature review while section 4 presents the results and analysis thereof. Certain findings that warrant further investigation are assessed and important conclusions are made.

Finally, any limitations of this study are stated and appropriate recommendations for further studies are made to evaluate both the theory developed in this research and to fill any gaps of knowledge identified from the findings.

2 Literature Review

2.1 The Media and financial markets

2.1.1 Introduction

The existing body of literature demonstrates that mass media reporting influences the degree of efficiency in the markets by improving the dissemination of information among investors (retail or institutional) and its capitalisation into the stock price. Peress (2014) developed an approach to examine changes in the newspaper reporting that are exogenous to stock market activity.

By focusing on influential newspapers across OECD countries between 1989 and 2010; the author investigated whether stock trading was different when most newspapers in a country would not publish due to employee strikes, distributors strikes or failure of printing. He concluded that media coverage contributes to trading activity and price formation evidenced by volume of trading falling 12% during days with strikes while idiosyncratic risk is reduced by 7%. Interestingly, he finds that these findings tend to diminish for large stocks but are more noticeable for small stocks. This has been proposed by a great many authors in the literature.

An interesting feature of the literature is how researchers establish the connection between news media reporting and equity markets i.e. at any time how can researchers determine if media caused stock market activity? Or if both media coverage and stock activity were caused by a possibly omitted variable that drives both events?

Recent studies have followed two methods to establish the link between newspaper reporting and equity markets. The first studies concentrate on events where the determinants of media coverage and market response can be disassociated e.g. Huberman and Regev (2001) show how a newspaper article on news of a break-through in cancer-curing technology on Sunday saw the share price of EntreMed rise from \$12 on Friday to \$52 the following Monday following the news article. Potential drawbacks exist to this method. Customarily, how can any research completely control for all stimulus of media coverage and investor demand? In the example of EntreMed, the breakthrough in cancer drugs technology had previously been presented in journals and other major newspapers in the USA up to 5 months earlier.

The second method adopted to establish the link between newspaper reporting and equity markets, which also solves the drawbacks of the first method, is followed by Engelberg and Parsons (2011) who also found out that newspaper reporting strongly predicts stock trading even after accounting for earnings, newspaper and investor characteristics. They employ a sample of 19 different, non-overlapping markets in the United States each with a different newspaper.

This yields a more reliable assessment of mass media's effect on the stock markets since the effect of newspaper reporting and of the events themselves can be disentangled.

Engelberg and Parsons (2011) found out that trading on the S&P 500 is highly correlated with the news media reporting period e.g earnings announcements by an S&P 500 stock will increase trading of that stock from 8% to nearly 50% if the media covers that earnings announcement. In some instances, media coverage increases stock trading by as much as 75% on news days.

One strength of this study is that the investigation is conducted in 19 different markets with the same earnings announcement information from January 1991 to December 2007 through collecting 3 pieces of data: a) earnings announcements, b) news coverage of such earnings announcements, and c) retail trader volume data.

By utilising such a wide geographic detail of retail investor readership, they find out that the mean of local media coverage is 2.8% with a standard deviation of 16.6% which shows that approximately 1/35 three-monthly/quarterly announcements receive attention from local newspapers. In simple regressions between local trading and local media coverage, the absolute volume of trading is \$2,200 in news days versus the trading volume of \$290 on "non-news" days. Media coverage increases trading volume by as much as 75%. Consistent with Tetlock (2007, 2010) and Ferguson *et al.* (2015), large firms display more trading which however bears very little correlation in statistical and economic significance to media coverage.

The authors perform a series of tests on the evidence too. For example, by investigating exogenous disturbances on the dissemination of newspaper information to investors (e.g weather storms), the researchers establish that media-induced trading is non-existent in such periods. Further complementary tests include considerations for differences in time zones between the markets e.g. a Wednesday article by the San Francisco Chronicle induces stock trading in the Northern California on the same day, whereas the same would take place in Atlanta on Thursday if reported on that day by, say, the Journal Constitution.

On the other hand, Klibanoff *et al.* (1998) investigate cognitive error as a cause of investor over-reaction and under-reaction. They investigate whether individual investors allot a higher rank to salient news in their trades than less prominent news even though both events have the same effect (if any) on firm fundamentals. They use single-country fund prices and net asset values to assess if striking news would then affect the fund prices to asset value. In their results, they show that price elasticity to asset value is very high suggesting that investors react more to

newspaper reporting and high trading volumes and volatility are witnessed for weeks with news as well.

A closer look on this study however reveals some gaps and shortcomings especially the use of a balance-sheet based Net Asset Value (NAV) as measure of fundamental value. With this method, the value of the assets may differ significantly based on the basis for measuring their asset value and this method also ignores off-balance sheet items. The hypothesis is that media reporting has a role in the scale of investors' response to variations in fundamentals.

Dougal *et al.* (2012) deviate from other studies to ascertain a link between financial journalists and stock performance. According to the authors, associations of newspaper reporting and equity markets have been speculative and anecdotal and therefore lack variation in the news content and relation to the firm fundamentals. The authors employ a dataset of two sources believed to provide a more robust variance of news media: the "Abreast of the Market" section of the Wall Street Journal (WSJ) that explains market activity, and the Dow Jones Industrial Average Index dividends and price series with a period of 1970 to December 2007. They argue that financial journalists possess the ability to influence investor conduct mainly in short term horizons.

A number of questions regarding this investigation remain to be addressed. Financial journalists are human beings subject to cognitive and other human biases (Kahneman and Tversky 1973). Investors/readers are also subject to cognitive and other human biases; emotional intelligence is also important (Goleman, 1995). How do we isolate the influence of these cognitive biases in the evidence? Also, the empirical design of the study implies that journalist through the use of complex or common words, length of the article, choice of titles, subtitles and tone, the writer can influence investor behaviour and lead to a predictable market action.

2.1.2 Predicting Stock Returns and Media coverage

According to Chan (2003) newspaper stocks with negative returns seem to predict continued underperformance for up to a year where most drift is on the downside of smaller stocks traded by retail investors who mainly rely on news media. He concludes that investors appear to under-react to public events and over-react to perceived private events where the findings are significantly stronger for the news stocks. In his study, the author measures stock price reaction to public news between 1980 and 1999 using a sample of 1557 stocks testing the hypothesis that stocks would exhibit no abnormal returns after public news announcements in the media.

In a similar study, DellaVigna and Pollet (2009) examine a decision where investor attention to news about earnings announcements affects their trading decision. These two researchers compare the investor reaction to Friday earnings announcements (potentially high investor inattention) to the reactions on other weekdays (investor attention assumed to be high). If investor inattention is high, stocks should display drift and a delayed response than other weekdays. In their results, Fridays are categorized by a 15% lesser instant response and a 70% higher delayed response.

2.2 Newspaper Reporting and Stock returns

2.2.1 Public News and Asymmetric Information

Tetlock (2010) utilises 29 years of data on all listed US stocks to examine the assumptions derived from the asymmetric model of a firm's share price: some traders will have information before its publicly available and then as the information becomes public through the news media other investors trade on the news providing liquidity to the informed traders. One merit to this study is the noticeably large sample the author uses in his investigation: a data sample of the Dow Jones new archive and Wall Street Journal articles on publicly listed US stocks in the period 1979 to 2007 which provides 2.2 million newspaper articles.

This study is conducted under the hypothesis that public news articles should eliminate information dissymmetry between the trader with prior information before it's public and the less informed trader. The first trader has an information advantage but experiences a liquidity shock before public newspaper articles present the information publicly. As the information becomes public through newspapers, it informs the relatively uninformed trader who then provides liquidity to the informed trader. As expected, the uninformed trader does not provide full liquidity cover for the informed traders liquidity shock. This model is similar to Wang (1994) and Holden and Subrahmanyam (2002). This research suggests that some traders would have used information from newspapers before it is public to inform their trades while other traders use the information to predict movement of future or expected returns.

This analysis produces four trading volume and return patterns as stipulated under the asymmetric information model. Firstly, 10-day reversals of daily returns are 38% higher on non-newspaper reporting days than on newspaper reporting days. Secondly, and on non-newspaper reporting days again, 10-day momentum in daily returns does not exist while it exists for newspaper reporting days. Thirdly, the cross-sectional relation between the firm's abnormal returns and turnover is momentarily 35% higher on newspaper reporting days; while finally, the price impact of order flow is again momentarily lower by 3.3% on newspaper reporting days (Tetlock, 2010). Share equity returns and volume of trading on newspaper

reporting days and non-newspaper reporting are compared using daily regressions as stipulated by Fama and Macbeth (1973).

Nevertheless, a consistent discovery in literature reviewed on public news and stock returns is that newspaper attention is a more reliable predictor of return mostly for the small firms and this proposes that small stock traders maybe more dependent on the news media than large institutional traders. These findings are consistent with Fang and Peress (2009), DellaVigna and Pollet (2009), Dougal *et al.* (2012), Chan (2003), Wang *et al.* (2018) and Ferguson *et al.* (2015), Engelberg and Parsons (2011), Odean *et al.* (2008) and Zhu *et al.* (2009).

Also, many existing studies in the broader literature have not differentiated between media coverage (which has been taken to be the frequency of coverage of a certain stock in the media) from the actual content about the stock in the newspapers. The tone of the newspaper about a stock is also important. Media coverage and stock market research seems to be lacking in this regard.

2.2.2 The Cross-sectional relation: Newspaper Reporting and stock return

Wang *et al.* (2018) inquire into newspaper reporting and any relations to changes in average returns in China using a sample of 1,500 shares from Shanghai and Shenzhen stock exchanges between the years 2000 and 2015. The sample employed in the study results in 222,160 observations of hand collected data from the China InfoBank which is a newspaper index covering over 1000 media networks including financial and commercial newspapers.

The data sample collected in the study includes newspaper content that is available to all types of investors retail or institutional and big or small such that investor-selection bias is avoided in this study. It is perhaps worth noting in assessing this study that Chinese newspaper headlines are often written fully in the Chinese language which is not a limitation in this case since the authors have included all newspapers both English or Chinese.

Much more interesting is the implication of this study on a firm's cost of capital. Senior executives are often aware of the traditional equity analyst reports and disclosures effect on the cost of capital, but this research proposes that a good Public Relations department aimed at attaining good newspaper reporting can attract investors and reduce cost of capital. Future investigations on mass media reporting, stock returns and the cost of capital would elucidate this implication.

However, the authors find that stocks without newspaper attention earn 55 basis points each month over stocks with newspaper attention. This finding is strengthened by adjusting for risk factors and short-term return reversals as argued by Tetlock (2010). More analysis from their investigation provides evidence in light of the hypothesis that newspaper reporting could play an increasingly

important role in augmenting other channels broadcasting information to a wider population of investors.

Interestingly, Wang *et al.* (2018) find that media slant is biased towards larger capitalisation shares and firms with high idiosyncratic risks. In addition, there is a strong correlation between stock covered by analysts and those reported by newspaper journalists. Another interesting piece of evidence from this study is that stocks with higher institutional holding in ownerships and those owned by state display lower newspaper attention as evidenced by Fang and Peress (2009) and Ferguson *et al.* (2015).

To sum up their findings, in an investigation on the relationship between newspaper reporting and share returns, stocks without any newspaper attention exhibit greater returns than those stocks with newspaper attention even when considering risk factors such as size, book-market, etc This cogitation is consistent with Fang and Peress (2009) who study the cross-sectional relations, if any significant, between newspaper reporting and share equity returns in the US market . They also found out that for firms with no newspaper attention there is an outperformance over those with newspaper attention of as much as 3% annually.

Surprisingly, Wang *et al.* (2018) discover that the “no-newspaper attention” return premium shows no reversal on a 12-month holding period as postulated by Chan (2003), DellaVigna and Pollet (2009) and Clara (2006). Also, while based on the same hypothesis and methodology, their findings on illiquidity proposition is unsatisfactory as compared to Fang and Peress (2009) i.e. newspaper-induced return premium should be biased towards the least liquid stocks where the newspaper reporting effect is brought about by impediment to trade.

2.2.3 Volume of News and Predicting Stock Returns

On a study on the FTSE 100 index of the UK, Ferguson *et al.* (2015) make contributions to the literature on newspaper reporting and share equity returns considering whether tone (negative or positive) and volume of media content in *The Financial Times (FT)*, *The Times*, *The Guardian* and *The Mirror* would shed more light on predictions of future returns. They employ a sample period from 1981 to 2010 (resulting in 264,647 newspaper headlines hand collected from the LexisNexis UK database). The tone of the media articles is derived from an analysis of all the media articles and each headline is compared to Loughran and McDonalds (2011) word list of positive and negative words to derive the tone of negative and positive words each in the headline.

This research sets out to achieve the following objectives:

- To examine the impact of news media content (negative or positive) on each of the FTSE 100 index stocks.
- To analyse the negativity or positivity in newspaper headlines in relation to earnings reports and determine whether tone presented useful information on a firm's fundamentals.
- The research conjectures that if traders display a tendency assign more importance to stocks mostly because of their newspaper reporting as stipulated by Barber and Odean (2008) and tone echoes investor sentimentality (Tetlock, 2007 and Macskassy *et al.*,2008), then tone and volume of newspaper articles combined must lead to a greater stock market reaction both stimuli.
- Through considering both the tone and volume of news (proxy for high media coverage) observations can be made about whether next period abnormal returns can be predicted sufficiently.

One merit to this enquiry is the utilisation of both negative and positive news which ensures that the researchers will have the overall distribution of news media content as opposed to Tetlock (2007) and Macskassy *et al.* (2008), amongst others, who only study the effects of negative newspaper attention on equity share returns.

Moreover, a robust methodology is adopted to test the hypothesis that news media coverage is a determinant of the cross-sectional dispersions for FTSE 100 firm returns. The media content is split by capitalisation and book-to-market ratios to assess return distribution of lower and higher visibility firms. This method is line with Barber and Odean (2008) who cross-question investor behaviour and news headlines, newspaper-induced abnormal trading volume and shares with extreme 1-day return as enjoin news attention to investor trading behaviour.

Ferguson *et al.* (2015) find that

- Both volume and tone of newspaper reporting predict abnormal returns in the next period while the impact of volume is more noticeable than tone.
- However, the impact of tone is enhanced more for small stocks with high book to market figures.
- This paper also finds evidence of an attention-grabbing effect i.e. investors are more likely to buy and hold stocks with more newspaper attention which is also evidenced more in large capitalization stocks.

- A strategy buying shares on newspaper attention would generate risk-adjusted returns of up to 19 basis points which are economically and statistically significant.
- Overall, the researchers propose that newspaper attention about a stock holds valuable information about its future returns.

Overall, the empirical work shows significant predictive power of newspaper reporting of abnormal returns over the next period hence corroborating with US evidence.

2.2.4 Mass Media Coverage and Stock Trading

Zheng *et al.* (2014) are of the opinion that newspaper reporting of stock markets influences performance and trading positions of mutual fund managers. In this paper, they uncover the relationship between trades of mutual fund managers and newspaper reporting of all New York Stock Exchange and 500 NASDAQ stocks from the 1st January 1993 to 31st December 2002 period. The choice of articles is underpinned by a weekly newspaper circulation average of newspapers in the US specifically: *USA Today*, *The New York times*, *The Washington Post* and *The Wall Street Journal*.

The mutual fund data is created by merging the CRSP Mutual Fund Database with the Thompson Financial CDA catalogue. The CRSP database provides information on fees, returns, age, total assets, investment objectives and other fund attributes. The CDA database on the other hand includes shareholdings of the funds composed from the Securities Exchange Commission filings. The investigation is restricted to open-end domestic equity funds.

The authors show clearly that mutual funds display unrelenting differences in their tendency to purchase newspaper reported shares and these findings hold even after accounting for size, liquidity and several share characteristics proven to influence funds trading. This research is based on two premises.

The first premise is in accordance with Barber and Odean (2008) who point out that retail investors are much more likely to exhibit preference for stocks with more newspaper and public attention than professional traders who, arguably, do not rely on newspaper reporting to initiate trading. This serves as their null hypothesis. A “limited attention” hypothesis is the premise that if professional mutual fund managers are subject to “limited attention”, then trades will be inclined towards “attention-grabbing” firms placed on their radar by mass media

coverage. There is a potential for stocks placed on the radar by mass media to save the high equity analyst research costs for the fund managers.

And, because mutual fund managers cannot normally short-sell shares, the “limited attention” hypothesis by the authors predicts that newspaper reporting will have greater effect on fund managers’ buy investment decisions than sell decisions. Secondly, the relation between the fund manager’s tendency to purchase shares with heavy newspaper attention will be stronger for buys than for sells. A cross-sectional analysis of the mutual funds trading on aggregate and an analysis of fund managers tendency to purchase newspaper reported shares is then performed which shows that:

a) In aggregate, fund managers have a tendency to hold more of stocks that have high newspaper attention and the results are the same even when accounting for liquidity, size and other risk factors.

b) Fund managers sell trades are not meaningfully affected by shares’ newspaper attention.

c) Thirdly, a negative correlation exists between mutual fund tendency to purchase shares with more newspaper attention and their resulting performance at the cross-section.. Funds in the strongest propensity decile underperform the funds in the weakest propensity decile by 1.1% to 2.8% per year although the results are dependent on the performance metric used.

Moreover, Solomon *et al.* (2014) believe that shares of portfolios with high past returns (called “winners”) attract investor funds only if they recently received newspaper attention. This implies that newspaper attention to shares that performed well in the past amplifies funds trading strategies. Zheng *et al.* (2014) shed more light on the research by generating an analysis to show that fund flows are not just related to newspaper-covered equity that outperformed in the past but shares that enjoy heavier newspaper reportage in general.

Overall, the findings are consistent with several papers that document that newspaper reporting of a stock affects its valuation and shareholder returns. (e.g., Hirschleifer *et al.* 2009; DellaVigna and Pollet 2009). Moreover, the research increases to the literature on mass media coverage and share equity returns by acknowledging the professional fund managers than the traditional individual investor featured in media-induced share trading studies.

2.3 The Stock Returns in Emerging Markets

This section presents the results of investigations onto the potential drivers of share equity returns in South Africa contrasting these with those factors identified by authors in the literature (e.g. Zheng et al., 2014; Fang and Peress, 2009 & Ferguson et al., 2015). There is a strong agreement that drivers of equity returns in South Africa include those identified by authors in the literature.

2.3.1 Empirical Work on Stock Returns in South Africa

Van Rensburg and Robertson (2003) question the design criteria of asset pricing models on the Johannesburg Stock Exchange in accordance with research conducted by Daniel and Titman (1997) and Daniel, Titman and Wei (2001) to establish whether factor loadings or their characteristic values, elucidate more changes in average returns on the JSE. They find out that variables such as cashflow-to-price, price-to-profit and size all have significant power regarding changes in average JSE returns.

For a sample of all Johannesburg Stock exchange firms, excluding cash shell companies, the Price-to-Earnings and natural logarithm of share capitalisation are obtained from the McGregor's (McG/BFA) database while a subsample of monthly returns for each stock in the sample was obtained from BARRA. For the sample period of July 1990 to June 2000, stocks where monthly traded volume is less than 1 basis point of the outstanding shares in the previous month are removed from the sample.

Factor portfolios are derived by sorting the firms in downward order of size and P/E ratios in each month. The return in the largest portfolio of size is denoted "Large" while smallest size portfolio is denoted "Small". A corresponding labelling is used for high P/E ratio and low P/E ratio rating categories. Points are marked in the ranking at 20% and 80% for each month. For each stock above or below the 20% or 80% point for each month, an equal-weighted return in the next month is computed. This return is the difference between the two extreme portfolios. Monthly returns are regressed on risk factors returns associated with small size and the risk factors associated with low P/E ratios to estimate the factor loadings on the stocks in the sample period.

To test for the cross-sectional relationship of share equity returns to factor loadings, the stocks are ranked in each month according to risk factors associated with small size, size attribute and the risk factors associated with low P/E ratios and P/E attributes. Quintile points are added at 20%, 40%, 60% and 80% points in the ranking for monthly returns which are formed for each factor loading, and attributes in the quintile groups. In order to create an independent sample

between loading on risk factors and attribute values, the firms are first ranked on attributes and thereafter loadings to the matching risk factor.

The authors find lower average returns connected with higher price-to-earnings stocks irregardless of corresponding factor loading. These results are in accordance with research which stipulates that using characteristic values rather than loadings on factors is a better design criterion for asset pricing models. The results also indicate that size is correlative to the loading on the size risk factors in a statistically significant way. For example, it is also observed higher loadings have a tendency to outperform for both the all-stock sample (0.84% monthly average outperformance) and the financial-industrial only sample (1.22% monthly average outperformance) on the small size factor derived in the investigation.

2.3.2 Emerging Markets and Stock Returns

Research conducted in emerging markets is often biased to point out that there are strong governmental influences on both the capital markets and stock-specific elements of emerging markets. It is also often pointed out that, in these markets, returns are significantly uncorrelated. Developed markets are often characterized as showing correlation among factors and strong commonality in capital markets and stock-specific elements. In contrast to developed markets, little is known about what drives changes in average stock returns in emerging markets.

According to Fama and French (1998) factors that drive the cross-sectional variations in stock returns in emerging markets are qualitatively similar to those in developed markets: size, momentum, price-to-earnings and book-to-market. However, their results suggest different pricing factors across the different markets.

Basiewicz and Auret (2010) test the practicability of the Fama and French 3-factor model in explaining JSE share returns. By performing tests on all publicly listed firms on the JSE between June 1989 and July 2005 with a total of 156 monthly observations, the authors find out that the tests provide evidence in support of the Fama and French (1993) three factor model on the JSE. Firm characteristics such as share price, accounting metrics and business strategy were collected.

It is interesting to note that the investigation excluded stocks for which relevant accounting data was uncollectible. These adjustments resulted in 114 firms being excluded in the observation. It would be interesting to note which specific stocks were removed from the sample in the case of the JSE where there can be only one stock listed in an industry sector. Were all industry sectors listed on the JSE represented in the sample? Or is the evidence being driven largely by some few industries where accounting data could be collected? Is the evidence more representative of the JSE or just a subset industry of the JSE?

However, the tests yield some very interesting results. In a regression test on grouped data, the Fama and French (1993) three factor model has been able to account for the value effect whereas regressions on ungrouped data, firm size has been able to display significant power in the prediction of pricing errors left behind by the Fama and French (1993) three factor model.

2.4 Conclusion on Literature Review

It would be interesting to understand newspaper reporting and the cross-section of stock returns particularly in the universe of emerging markets and South Africa. It hardly needs reiterating that one of the pillars of investment management is understanding of cross section of share equity returns essential for designing asset pricing models. The appeal of investigating South African newspaper coverage and the cross section of the JSE returns is that it allows investment managers in South Africa and emerging markets to make more informed trades and investment decisions.

More importantly, such as a probe would contribute to the presently scant knowledge and learning on corporate finance literature in emerging markets and especially South Africa. The review of literature clearly indicates that we almost never investigate the effect of newspaper reporting on the equity markets in Africa. Tests on the relationship-if any- of news media coverage and stock trading on the JSE and predicting stock returns should be included in explaining the changes in average returns in the JSE. The empirical objective of this research is therefore important in that it allows an examination of both economic and statistically significant answers to the question.

3 Design and Methodology

This section of the study focuses on the data, the methodology and the research objectives derived on the guidance of the preceding literature review.

3.1 Research Questions and Hypothesis

An analysis of the literature provides evidence of an effect of newspaper reporting on the stock price and stock returns; interesting is whether this same effect can be found for the emerging markets such as South Africa and the JSE. This research extends this body of work towards such a market by investigating whether mass media coverage from 23 newspapers can affect stock returns for 127 JSE stocks. The data and methodology utilised to answer the following questions is shortly detailed. The empirical objective of this paper can be divided into 2 parts: media coverage effects on stock returns on the JSE and an analysis of media coverage patterns of stocks in this study.

The primary objective of this research, however, is to find out if media coverage of JSE stocks affects their returns i.e. do stocks without newspaper attention outperform those with newspaper attention as suggested by Fang and Peress (2009) and Wang et al (2018)? The objective is to derive two portfolios of “no news” stocks and “with news” stocks and find out which portfolio outperforms even after adjusting for well known risk factors such size, market, profitability, investment growth and value captured by the CAPM, Carhart 4-factor and Fama-French 3-factor and 5-factor models. It is therefore important to make several hypotheses beforehand to guide our research. We hypothesize that:

1. Overall, there is a low media coverage in general of the Johannesburg Stock Exchange stocks. 80% of all observations may not be featured in any month.
2. Only 1% or less of all the observations will have 5 or more headlines in any given month.
3. Media coverage is slightly skewed towards financial service and consumer goods stocks which most South Africans are heavily dependent on.
4. There is a growing trend towards more coverage of stocks of the JSE from 2013 to 2017. The percentage of stocks featured in the news media increases over the period.
5. When sorting stocks on media coverage alone, a “no news” return premium exists that is statistically significant.
6. Small size and low book-to-market ratio stocks experience a statistically significant “no news” return premium.
7. A “no news” return premium does not disappear even adjusting for well known risk factors such size, market, value, profitability, momentum or investment.

3.2 Data

The sampling method used in this study is selective or non-probability sampling. We use the number of articles about a stock on 23 influential newspapers in South Africa to proxy for a stocks overall newspaper attention. The newspapers utilised in this study are: *The Times*, *Cape Times*, *Business Day*, *The Herald*, *Cape Times*, *Cape Argus*, *Daily Dispatch*, *The New Age*, *Pretoria news*, *The Mercury*, *Daily News*, *Sowetan*, *Sunday Times*, *The Post*, *The Star*, *Sunday World*, *Sunday Tribune*, *The Independent on Saturday*, *Argus Weekend*, *Mail & Guardian*, *The Weekender*, *Weekend Post* and *The Sunday Independent*. Newspapers that are specific to certain provinces e.g Pretoria News for Gauteng, Cape Argus for Eastern and Western Cape are also included.

To obtain media coverage data for each stock, a systematic search of the LexisNexis newspaper database provided by the University of Cape Town Library is carried out to produce a frequency table where the number of headline articles published about a stock in a given month represent media coverage for that stock for that month. LexisNexis uses a SmartIndexing Technology™ that uses “relevance scores” to ascertain the quality of the match between a search term and news article. That is, using this technology improves efficiency for media attention of our stocks because one stock such as ABSA can be searched as ABSA Bank, ABSA or ABSA Group and produce different search results for each word. This SmartIndexing criterion is based on location, keyword frequency, and source of search item. To ensure that we include only search results that are relevant for our study, only search results with a relevance score of 90% and above are considered. LexisNexis refers to these as “Major references”. Following previous work by Fang and Peress (2009), Chan (2003), Wang *et al.* (2018) and Ferguson *et al.* (2015), the study focuses only on headline news and derives a frequency table where the number of headlines about a certain stock in a month represents media coverage of that stock in that month.

On collecting the stocks required for the empirical objective, the research implements stock-selection criteria on stocks comprising the JSE FTSE/ALL share index during the 5-year period from 1 January 2013 to 31 December 2017 (a total of 7620 firm-month observations) as the first piece of data. The first criterion is that all stocks must be listed in the JSE and comprising the JSE All share index during the January 2013 to December 2017 period; that is de-listed or newly listed firms are excluded from the sample. Firms that changed names are included in the research on both their older name and the subsequent name. The second criterion is that small, illiquid stocks are excluded. This is to ensure that the results in the cross-sectional analysis are not driven by bid-ask bounce or small illiquid stocks. In eliminating small stocks, we utilise the Goyal *et al.* (2006) criteria on selecting liquid stocks for their research. Stocks were selected for their sample of the basis

of at least 10 trading days each month. Based on this sampling criteria, 127 stocks have been included in the research.

Various accounting data will also be used for our empirical study such as monthly stock prices, monthly stock returns (including dividends), monthly market values and book value of equity. This data is obtained from Bloomberg and DataStream terminals provided by the University of Cape Town library. The 3-month Jibar (Johannesburg Interbank Average Rate) rates are also required to proxy for the risk-free rate used in the Fama and French 3-factor and 5-factor model regressions and calculating excess returns. This data is also obtained from DataStream terminal. Monthly risk factors for the Fama and French 3-factor Model, Carhart 4-factor model and Fama and French 5-factor models have also been sourced from a local securities research firm.

3.3 Methodology

The methodology used to examine whether news media coverage has an effect on stock returns is similar in nature to that followed by Fang and Peress (2009). Therefore, this study utilises their methodology as the starting point. The first step is to examine the method followed by Fang and Peress (2009) in attempting to find the solution to the question.

3.3.1 Fang and Peress (2009)

Fang and Peress (2009) examined if media coverage affected stock returns in the NYSE and NASDAQ markets. By dividing their sample into 3 categories of no-news media coverage, low-media coverage and high-media coverage they were able to determine that no-news media coverage outperformed high-media coverage stocks. This research does not divide the sample into 3 groups since 99% of the observations experience only less than 6 headlines and on average only 4 firms have 5 or more headlines. As such, the method used by Fang and Peress (2009) is not followed but instead the sample is divided into only two portfolios: Stocks with newspaper attention and stocks without newspaper attention.

Similar to Fang and Peress (2009) however, the inquiry derives a univariate analysis of the newspaper reporting and equal-weighted stock returns. Firstly, stocks are categorized by firm-characteristics including firm size, stock price, book-to-market ratio or past-month return. Terciles are then formed for each characteristic essentially dividing the stocks into low firm-characteristic, mid-firm characteristic and high-characteristic; denoted 1, 2 and 3 respectively with 3 representing the topmost value of the firm attribute. Then, each tercile is subdivided further deriving the two portfolios: “no-news media coverage” stocks and “with news media coverage” stocks. Finally, for each tercile, equal-weighted stock returns are calculated as also in Chan (2003).

Fang and Peress (2009) also employ a multivariate analysis to adjust for risk factors captured by the Fama and French 3-factor models and Carhart 4-factor models. This study digresses from this and adds another model, namely the Fama and French 5-factor model to include profitability and investment risk factors. It would be interesting to include the profitability and investment risk factors not added in prior research. In multivariate analysis section again, Fang and Peress (2009) form zero-investment portfolios of stocks each month categorized by newspaper attention. For each month, the firms are split into no-newspaper attention, low-newspaper attention and high-newspaper attention portfolios. This research has only two portfolios and therefore for each month stocks will be divided into 2 portfolios of “no-news” and “with-news” portfolios.

The authors proceed onto to calculate the returns to their 3 portfolios by going long on the “no-news” portfolios and going short on the high-news portfolios to derive returns of a zero-investment strategy which are then regressed against 4 risk factors captured by Fama and French 3-factor models and Carhart 4-factor model which adds the fourth risk factor to Fama and French 3-factor model of momentum. They also rebalance their 3 portfolios every month and produce time-series returns by buying no-news stocks and selling high-news stocks. If a return premium exists between no-news and high-news portfolios and the return is not fully explained by the known factors, then the alpha derived by Fang and Peress (2009) should be statistically significant and therefore the media effect on the cross section exist. Also, if the alpha derived is statistically significant but the coefficient negative, then the media effect on the cross-section does not exist as well.

The last two statements above are very important because they will guide our results towards concluding if mass media coverage in the South African context does indeed has a significant effect on the changes in average stock returns on the JSE.

Thenceforth, this research deviates from Fang and Peress (2009) on robustness checks of the no-news media return premium: provided such a “no news” return premium exists. According to the literature review, if a no-media coverage return premium exists from the data analysis, then this can be explained by an illiquidity phenomenon. That is, if the no-media coverage return premium exists, an arbitrage opportunity exists for investors to take advantage of this mispricing and therefore slowly diminish the return premium. Therefore, such a no-media coverage premium can only exist if there are severe market conditions preventing investors from exploiting it. This is the “impediments to trade” hypothesis alluded to by Fang and Peress (2009) in their study reviewed above. This research will provide empirical tests for this hypothesis provided such a “no news” return exists in the first place. This study will use 3 liquidity measures to capture this effect, if

any, exists in explaining the no-news return premium. Namely, Amihud's (2002) illiquidity ratio, Rand trading volume and price. The investigation will sort stocks into low, medium and high groups of each of these 3 liquidity measures to investigate in which subset is the media effect strongest. The three measures will be classified into low, media and high to investigate the effect of illiquidity on the no-media coverage return premium, if it exists. If the alphas from the regressions of the portfolios of low-liquidity are statistically insignificant, then the no-media coverage return premium does not exist due to "impediments to trade" hypothesis.

Fang and Peress (2009) also test for the media effect reported in their research for the "short term reversals" effect suggested by Chan (2003) that for stocks with newspaper attention with negative returns seem to predict continued underperformance for up to a year where most drift is on the downside of smaller stocks traded by retail investors who mainly rely on news media. Upon having determined such a "no news" return premium, this study shall also test for such an effect in the second phase of effects checks. The zero-investment portfolio used in the multivariate regression shall be separated into 3 different portfolios each one formed at 1 month-, 3-month and 6-months intervals. The sub portfolios will be held until 12 months at which stage, after 1, 3, 6, 9 and 12 months during the period, the return to the portfolios will be calculated and regressed with Fama and French 3-factor, Carhart 4-Factor and Fama and French 5-factor models. Provided that the alphas derived for all the 3 portfolios are insignificant, then the media effect is caused by the short-term reversal and drift effect.

3.3.2 Mathematical Models

Four mathematical models are used to account for well known risk factors captured in these models such market, size, value, momentum, profitability and investment. These risk factors are captured in the following models:

CAPM

$$R_{it} = \alpha_i + R_f + \beta_i(R_m - R_f) + e_{it}$$

R_{it} is the return of the stock, α_i is the intercept and alpha while R_f is the risk-free rate and β_i represents the measure of the systematic risk, R_M market return and $R_M - R_f$ is the market risk premium and e_{it} is the residual.

Fama-French 3 Factor model:

$$R_{it} = \alpha_i + R_f + \beta_i^{\text{market}}(R_m - R_f) + \beta_i^{\text{size}}SMB_t + \beta_i^{\text{value}}HML_t + e_{it}$$

The second mathematical model used in this investigation is the Fama-French 3-factor model where:

- β_i^{market} is the market beta or measure of systematic risk
- $(R_m - r_f)$ is the market risk premium and
- R_m is market return
- β_i^{size} measures the sensitivity of the stocks to movements in small stocks or the SMB portfolio i.e. the return to small capitalization stocks minus the returns of large capitalisation stocks
- β_i^{value} captures the sensitivity of the stocks to movements in value stocks or the HML portfolio i.e. which is the portfolio of stocks with high book-to-market values minus the return of stocks with low book-to-market values.

The CAPM is in fact a one-factor model which Fama-French 3-factor extends by adding two more risk factors: SMB (Small minus Big) which captures the risk of firm size in an investment. It is the return of a portfolio of small capitalisation stocks less the return of a portfolio of large capitalisation stocks. Another added risk factor is the HML (High minus Low) which captures risk associated with “growth” (low book-to-market ratios) and “value” which is high book-to-market ratios. HML is the return of a portfolio with high book-to-market ratios less the return of a portfolio with low book-to-market ratios.

Carhart 4-factor model:

$$R_{it} = \alpha_i + RF + \beta_i^{\text{market}}(R_m - RF) + \beta_i^{\text{size}}SMB_t + \beta_i^{\text{value}}HML_t + e_{it} + \beta_i^{\text{momentum}}WML_t$$

Our third mathematical model is the Carhart 4-factor model. This model adds one more risk factor to the Fama-French 3-factor model, $\beta_i^{\text{momentum}}$, which captures the stocks sensitivity to the momentum factor described as the average return of a portfolio of stocks with the best prior period performance minus the return of portfolio of stocks with the least returns. In this way, the Carhart 4-factor model adds an additional fourth risk factor defined in the same way as the HML and SMB.

The final model is the Fama and French 5-factor model which introduces Profitability and Investment risk factors to our empirical study. The following equation illustrates the model:

$$R_{it} = \alpha_i + RF + \beta_i^{\text{market}}(R_m - RF) + \beta_i^{\text{size}}SMB_t + \beta_i^{\text{value}}HML_t + \beta_i^{\text{profit}}RMW_t + \beta_i^{\text{investment}}CMA_t + e_{it}$$

Where, β_i^{profit} and $\beta_i^{\text{investment}}$ measure the sensitivity of stock to the profitability and investment factors and RMW (Robust *minus* Weak) is the average return on two weak operating profit portfolios deducted from the average return of two robust operating profitable portfolios and CMA (Conservative *minus* Aggressive) is the average return on

two conservative investment portfolios deducted from the returns of the two aggressive investment portfolios.

4 Results

This section of the research presents interesting results in answering the question of whether South African media coverage of JSE stocks can affect differential returns at the cross section and whether the return premium derived, if any, is economically and statistically significant. Answers to the questions posed with the guidance of the literature review and the research hypothesis are evaluated and areas that warrant specific attention are further detailed and appropriate conclusions are drawn.

4.1 Summary Statistics of Media Coverage

The frequency of media coverage of the JSE stocks employed in this investigation is surprisingly low compared to the analysis from the above literature review. In general South African stocks experience far less media coverage than their counterparts in the USA and Europe employed on media coverage and stock price research analysed in the literature review. This could possibly be due to the development phase of both the South African media and the Johannesburg Stock Exchange. Below is a summary of the frequency of media coverage of JSE stocks employed in this research for the sample period 1 January 2013 to 31 December 2017.

Research Hypothesis 1: Overall, there is a low media coverage in general of the Johannesburg Stock Exchange stocks. 80% of all observations may not be featured in any month.

Research Hypothesis 2: Only 1% or less of all the observations will have 5 or more headlines in any given month.

Media coverage data is obtained by systematically searching the LexisNexis newspaper database for each of the stocks in the sample in the sample period. The number of headline articles a stock in a given month represents coverage of that stock in that month. Table 1 presents frequency coverage statistics for all our observations. Some interesting observations can be made about the South African news media coverage of the JSE stocks.

At first glance, media coverage of JSE stocks is surprisingly low with 99% of observations featured only 6 times or less in the media. Therefore, about 1% of the observations are reported at least 7 times in the South African newspaper media. 73% of the 7620 firm-month observations receive no newspaper attention between 1 January 2013 and 31 December 2017, our sample period. This result rejects our hypothesis that overall 80% of all observations may be not be featured. Also, only 1% of the observations have 7 or more headlines in a given month versus the close 5 headlines hypothesized. The surprisingly low coverage of the JSE could potentially be attributed to the developing phase of both the South African media

and the JSE. South Africa is an emerging market where the stock market is relatively small and trading in shares is less frequent and sometimes the general public does not have enough confidence in the integrity of the stock markets; trading of shares further small and limited to a few firms.

Table 1: Frequency of Newspaper Reportage

Headline News			
Number	Frequency	Percent	Cumulative Percent
0	5557	73%	73%
1	1051	14%	87%
2	424	6%	92%
3	224	3%	95%
4	139	2%	97%
5	89	1%	98%
6	45	1%	99%
7	21	0%	99%
8	20	0%	99%
9	19	0%	100%
10	6	0%	100%
11	6	0%	100%
12	5	0%	100%
13	3	0%	100%
14	1	0%	100%
15	2	0%	100%
16	2	0%	100%
17	0	0%	100%
18	1	0%	100%
21	1	0%	100%
22	0	0%	100%
23	1	0%	100%
24	1	0%	100%
25	1	0%	100%
30	1	0%	100%
31	0	0%	100%
Total	7620		

Research Hypothesis 3: There is a growing trend towards more coverage of stocks of the JSE from 2013 to 2017. The percentage of stocks featured in the news media increases over the period.

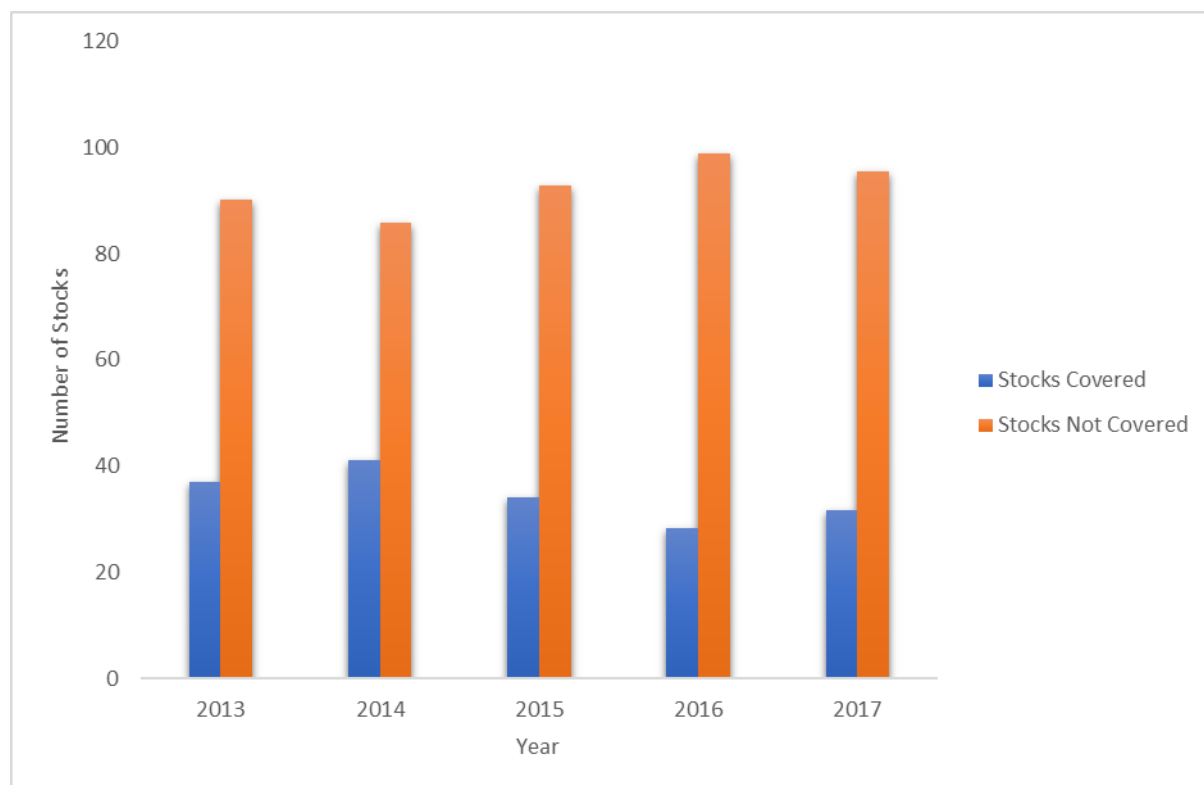
Table 2 and figure 1 further investigate media coverage patterns annually in subcategories. On average, 34 firms from the sample are covered by the news media in a month compared to 93 firms that are not covered in the media over the sample period. This makes an average annual coverage of 27%. However, there is no improvement towards more coverage witnessed from the data as hypothesized. In a subset of stocks that have news media attention, on average,

31 stocks every year over the sample period are covered 4 times or less compared to only 4 firms with more than four headlines.

Table 2: Media Coverage yearly

Year	Stocks Covered	Stocks Not Covered	% of Coverage	Stocks with News	
				4 or fewer	5 or more
2013	37	90	29%	33	4
2014	41	86	32%	37	4
2015	34	93	27%	30	4
2016	28	99	22%	27	2
2017	32	95	25%	27	5
Time Series Average	34	93	27%	31	4

Figure 1: Media Coverage of No News Stocks and News Stocks yearly

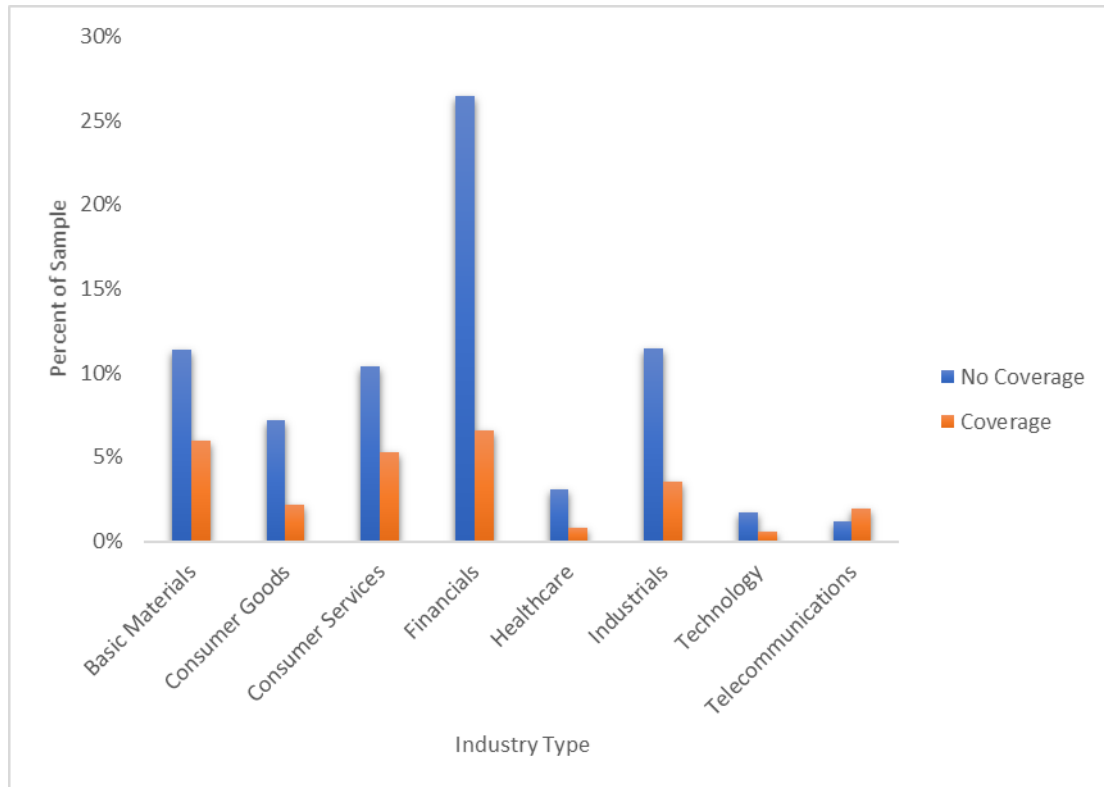


Research Hypothesis 4: Media coverage is slightly skewed towards financial service and consumer goods stocks which most South Africans are heavily dependent on.

To the extent that mass media coverage in South Africa is significantly biased towards some industries, then the results observed in the cross-sectional pattern in attempting to answer the question would be a disguised “industry effect.”.

However, figure 2 below illustrates that there is no noticeable media bias towards any industry.

Figure 2: Industry Distribution of Media Coverage



4.2 Media Coverage and Stock Returns

4.2.1 Univariate Analysis

Research hypothesis 5: When sorting stocks on media coverage alone, a “no news” return premium exists that is statistically significant.

In univariate analysis, the stocks are first categorized into terciles by firm attributes such as firm size, past and current returns and stock price. For each firm characteristic, tercile 1 and 3 represent the bottommost and topmost values of that firm-characteristic. Then, each tercile is further divided into two subgroups of firms with “no news” and firms “with news” to investigate any outperformance by “no news” stocks as witnessed by Fang and Peress (2009) in their study or Wang *et al.* (2018). Terciles are used to divide the stocks into equal, diversified portfolios. Equal-weighted returns are then calculated for the following month. *p* values according to Wilcoxon signed-rank examination are computed with the aid of SPSS statistical package.

Table 3: Newspaper Reporting and Share returns: univariate analysis

	Average Monthly Return				Average Number of Stocks	
	Media Coverage		No <i>minus</i> With	<i>p</i> Value	Media Coverage	
	No News	With News			With News	No News
All Stocks (EW)	1,14%	1,00%	0,13%	0,977	34,38	92,62
Panel A: Size (EW)						
1	1,02%	0,85%	0,17%	0,581	7,85	35,15
2	1,21%	0,92%	0,28%	0,512	11,68	32,32
3	1,19%	1,13%	0,06%	0,740	14,85	25,15
Panel B: Price (EW)						
1	1,08%	0,99%	0,08%	0,837	8,63	34,37
2	1,05%	0,79%	0,26%	0,531	11,63	30,37
3	1,33%	0,92%	0,41%	0,453	14,12	27,88
Panel C: Current Month Return (EW)						
1	0,31%	-0,30%	0,61%	0,245	13,70	31,30
2	1,04%	0,88%	0,16%	0,837	10,52	28,48
3	1,99%	2,78%	-0,79%	0,096	10,17	32,83
Panel D: Past Month Return (EW)						
1	0,30%	-0,05%	0,35%	0,350	11,68	27,32
2	1,07%	0,98%	0,10%	0,702	9,62	33,38
3	1,98%	2,61%	-0,63%	0,056		
Panel E: Book to Market (EW)						
1	1,30%	1,64%	-0,35%	0,183	13,18	28,82
2	1,31%	0,68%	0,63%	0,222	10,57	31,43
3	0,90%	0,41%	0,49%	0,373	10,63	32,37

Table 3 reports average monthly returns for a portfolio of “no newspaper attention” stocks and a portfolio of “with newspaper attention” stocks. Unconditionally, stocks that have zero news media attention have an average monthly return of 1.14% compared to approximately 1% of those stocks that enjoy media attention, a difference of 0.13% monthly (1.57% annually). However, this return premium is not statistically significant at the 95% confidence level. Thus, categorizing firms alone by newspaper attention does not yield a statistically significant difference in changes in average stock returns. Also, the average monthly number of stocks with newspaper attention and without media attention is preceding summary statistics of newspaper reporting.

This research therefore finds no statistically significant “no news” return premium at the 95% confidence level as witnessed by Fang and Peress (2009) in their investigation of the USA and European markets. Possibly, the inexistence of the media effect in the JSE could be as a result of differences in characteristics of the

USA and European stock markets to the JSE. As observed from the literature review, this research is the first of its kind conducted outside the developed stock markets. Table 3 therefore rejects the hypothesis.

Research Hypothesis 6: Small size and low book-to-market ratio stocks experience a statistically significant “no news” return premium.

The classification of Panel A to E in Table 3 attempts to isolate any return differential by various firm characteristics. It is way to determine in which subset of firm characteristic would be the media effect be the strongest i.e. do firms with small size, for example, experience a highly economic “no news” return as noted by Wang *et al.* (2018) or not. In general, all panels present findings consistent with the unconditional result. In Panel A, although the difference between “No newspaper attention” and “with newspaper attention” stocks is positive, it is not statistically significant at the 95% confidence level. This result is again contrary to findings by Fang and Peress (2009) who found out that small stocks have more exposure in the “no news” return premium statistically significant at the 95% confidence level. Panel E on book to market ratios also shows results inconsistent with Fang and Peress (2009) findings on the effect of growth and value stocks on the no-news return premium. In their research, they found a strong premium for growth stocks without any newspaper attention. This research finds no statistically significant results for growth or value stocks.

Given the sample coverage of 7620 firm-month observations, it is not feasible for this research to determine the media tone from the newspaper headlines. As a result, to investigate the media effect further the stocks are divided into “loser” stocks and “winner” stocks as in Chan (2003) where stocks are ranked by monthly raw returns and the top tercile selected as “winner stocks” and the bottom tercile labelled as “loser stocks”, respectively. Table 4 below shows the average monthly stock returns for loser stocks and winner stocks in subsets of “no newspaper attention” and “with newspaper attention” for each of the annual periods in our sample period. Time series averages for this table show that for loser stocks, “no news” stocks earn higher returns than “news” stocks while for winner stocks the “no news” and “news” stocks returns are slightly similar.

Table 4: Monthly Average Returns for Winner Stocks and Loser Stocks

Year	Average Stock Returns			
	Losers		Winners	
	No News	News	No News	News
2013	0,0076464	0,0014322	0,0295166	0,0267455
2014	0,0052603	-0,0038280	0,0204957	0,0351558
2015	-0,0198493	-0,0275039	0,0190716	0,0101484
2016	0,0221419	0,0174222	0,0165656	0,0465546
2017	0,0026621	-0,0103896	0,0177071	0,0095856
Time Series Average	0,0035723	-0,0045734	0,0206713	0,0256380

Table 5 indicates that time series average of market values of stocks with newspaper reporting is greater than for stocks with no newspaper attention for both loser and winner subsamples.

Table 5: Average Market Values for Winner Stocks and Loser Stocks

Year	Average Market Values			
	Loser		Winners	
	No News	News	No News	News
2013	37322	64770	50862	59326
2014	40004	76040	62979	98024
2015	42623	61183	88259	98035
2016	36197	79874	97892	110853
2017	42670	46503	103320	148188
Time Series	39763	65674	80662	102885

4.2.2 Multivariate Analysis

Research Hypothesis 7: A “no news” return premium does not disappear even adjusting for well known risk factors such size, market, value, profitability, momentum or investment.

Table 6 presents the results for the multivariate analysis of a strategy that longs (buys) a portfolio of stocks without any newspaper attention and shorts (sells) a portfolio of stocks with newspaper media attention. The returns of the strategy are regressed against well known risk factors captured in the Fama and French 3-factor, Carhart 4-Factor and Fama and French 5-Factor models. The first row of Table 6 shows the intercept values or alphas and the p values. It may be seen that for all the 3 regressions that the corresponding alphas are negative and statistically significant. This shows that the supposed statistically significant return premium for holding stocks with no newspaper reportage over those stocks with newspaper coverage effect does not exist in the South African market. The table confirms the result consistent with the univariate analysis where a portfolio of JSE stocks with

no newspaper attention outperforms a portfolio of JSE stocks with newspaper coverage however the results are not statistically significant.

Table 6: Media coverage and stock returns: a multivariate analysis

	Model 1: Fama and French 3-factor	Model 2: Carhart 4-Factor	Model 5: Fama and French 5-Factor Regression
Panel A: Long/Short Portfolio			
Intercept	-0,060150	-0,0611634	-0,0608548
<i>p Value</i>	0,000	0,000	0,000
<i>Significance</i>	1%	1%	1%
Market-Rf	-0,229	-0,325	-0,175
<i>p Value</i>	0,067	0,029	0,224
<i>Significance</i>		5%	
SMB	0,319	0,128	0,336
<i>p Value</i>	0,190	0,644	0,273
HML	-0,289	-0,244	-0,148
<i>p Value</i>	0,034	0,079	0,448
<i>Significance</i>	5%		
UMD		0,249	
<i>p Value</i>		0,245	
RMW			0,159
<i>p Value</i>			0,468
CMA			-0,315
<i>p Value</i>			0,114
Obs	60	60	60
R ²	13%	14%	18%
Panel B: Alphas for No News Stocks			
Intercept	-0,061	-0,062	-0,061
<i>p Value</i>	0,000	0,000	0,000
Panel C: Alphas for "With News" Stocks			
Intercept	-0,065	-0,066	-0,065
<i>p Value</i>	0,000	0,000	0,000

Panels B and C of Table 6 investigate the long (stocks without news coverage) and short (stocks with news coverage) legs of the portfolio separately. The results are consistent with univariate and multivariate analysis. The results here show that the alpha of the long position is higher than that of the short position and the alphas for all 3 regressions are statistically significant. This results in an outperformance which is already found to be insignificant at the 5% confidence level. Of the loadings on the risk factors, the book-to-market factor (HML) in the Fama and French 3-factor regression has a negative and significant coefficient which indicates that the zero-investment strategy has negative correlation to high book to market equity. However, no significant results are found for momentum, size, profitability and investment risk factors.

All in all, the media effect on stock returns does not exist for the JSE market; while a “no news” return premium can be found between a portfolio of no-news stocks and with-news stocks, it is not statistically significant. Therefore, this research will not proceed towards empirical tests of impediments to trade hypothesis, illiquidity phenomenon and short-term reversals suggested in the methodology.

5 Conclusion and Recommendations

5.1 Summary and Recommendations

The initial overarching objective of this study was to replicate elements of literature on mass newspaper reporting and changes in average returns that had previously only been adopted for developed markets and apply them to the South African context and in particular the JSE. Literature on mass media coverage and the stock market has failed to research emerging markets. While recognizing the limitations of the investigation, this research has largely achieved the empirical objective.

By utilising a sample of 127 stocks listed in the JSE and 23 influential newspapers in South Africa, the study tested the hypothesis that mass media coverage alleviates financial information frictions and therefore affects security pricing even if it does not present genuine news. Through constructing two equity portfolios of “No-news” equity portfolio and “With news” equity portfolios, an investigation was carried out that found out that there is no statistically significant “no-news” return premium as specified in the literature. Further analysis of data showed that media coverage of the JSE stocks is surprisingly low with 99% of observations having only 6 headlines or less in the media. Therefore, about 1% of the observations are reported at least 7 times in the South African newspaper media.

In the original proposal, the research emphasized the need to investigate whether such diverse and influential media in South Africa had any significant influence on returns of JSE stocks. As intended, it was found out that a “No news” equity portfolio outperformed a “With News” equity portfolio however the results are not statistically significant at the 95% confidence level.

Unfortunately, it proved more difficult than expected to isolate media content and tone of each article from just the frequency of coverage as had been argued as one weakness of the literature reviewed. Due to the 7,620 firm-month observations, it was too difficult to examine content and tone on each headline in each article for the 127 stocks in the sample period. The author has concluded that this would not be feasible for this investigation. Another challenge was to explore which newspaper had the most coverage of the JSE due to the sample size of 127 stocks with 23 newspapers and over a 5-year period. Nevertheless, the emerging themes from this study remain consistent with all the literature reviewed and correctly achieve the original aim and objectives.

In conclusion, the analysis of this study could be taken further to determine the relationships between media coverage and other aspects of the Johannesburg Stock Exchange for example liquidity of the JSE stocks, trading activity and volume as well as predicting stock returns.

6 Reference List

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