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Understanding Investor Requirements Utilising Web-Log Data

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DECLARATION

I, Ilan Fisher, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Ilan Fisher

Signed at ………

On the 16th day of September 2018

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Abstract

Communications technology is advancing at a rapid rate, resulting in the continual decrease of information dissemination costs and an increase in the number of mediums available to corporates for stakeholder communication. This advancement in technology has resulted in increased consumption of investor relations information in a digital format and a general movement towards utilising the internet as a key communications medium for stakeholder reporting. The ability to understand stakeholders and their online information requirements is becoming more important in this rapidly changing environment.

The purpose of this study is to understand the information requirements of investors when making investment decisions, with the key objectives being to firstly understand how investors engage with online integrated reports and secondly to understand the effect of online integrated reporting on the publishing companies share price.

This study makes use of a web-log dataset that tracks online integrated report user behaviour, as this information is believed to be used in the investment decision making process. Previous studies have been conducted with the aim of understanding investor behaviour and their information requirements, however, it has proven difficult to execute due to a lack of effective research approaches and access to investor activity (Rowbottom, Allam, & Lymer, 2005). The opportunity to utilise online integrated reporting web-log data across a number of clients and sectors in South Africa results in a unique set of insights that are relevant to a number of stakeholders in South Africa. Due to the fact that access to such a data-set is typically difficult to acquire, this study presents the opportunity to truly build on the understanding of investor user behaviour in a South African setting.

A web log data-set consisting of 9 Johannesburg Stock Exchange listed companies that operate in a number of industries in South Africa was utilised for the quantitative analysis. A Correspondence Analysis was utilised as an exploratory tool in order to investigate and better understand how users engage with the content of online

integrated reports. A Correlation Analysis was run with the aim of better understanding the relationship between the different sections of the reports in order to gain further insight and build on the learnings of Correspondence Analysis. In order to better understand the impact that online integrated reporting has on the publishing companies share price, an attempt using multiple linear regression has been made to quantify the impact that online integrated reporting has on a company's share.

The results of the study indicate that, whilst small, the integrated report does in fact have an impact on the company's share price. More specifically the research showed that the only significant section that had an impact on the share price was divisional reviews and its associated content that relates to social, ethical and environmental issues. In terms of investor information requirements and behaviour, the research was able to generate insights that are different from studies that have previously been conducted. Whilst previous studies have focused on what information is important to investors, particularly with regards to financial vs. non-financial information requirements, this study took an approach that revealed that particular pieces of content are related with financial metrics where others are not. The analysis also highlights that specific content is important to users depending on the users' industry.

To the best of my knowledge, the use of such a unique data set and associated methodology has not been applied to the problem statement and has therefore resulted in a unique set of insights. Previous studies conducted on the topic of investor information requirements are inconclusive, the results produced by this study add to the growing body of knowledge and suggest that; social, ethical and environmental content is important to investors and that whilst small, online integrated reporting does in fact have an impact on the publishing company's share price.

Whilst the results that have been generated are insightful, there are a number of limitations that are associated with the study. There are 2 key limitations that are required to be considered; firstly, the research indicates that there are a number of factors that have an impact on share price variation, only some of which have been included and explored in the regression model. Causality of the variables that are investigated cannot be determined and are not explained by the coefficients of regression. The second limitation of the study that needs to be considered is the fact

that there is no required structure to which online integrated reports are required to adhere to. The analysis required the manual categorisation of the sections of the report into predefined categories that are typically incorporated into reports. The analysis is therefore limited to the categories that have been chosen as well as the accuracy of categorisation.

In order to build on this study as well as the on related studies on the topic, it is suggested that focused research is carried out utilising access to the of the web-log data set. This focused research would utilise a forward-looking custom-built dataset in which data is collected with the specific aim of addressing hypotheses rather than utilising a historical secondary data set.

Keywords: Online Integrated Reporting, Web-Log Data, Correspondence Analysis, Investor Relations, Online Reporting

1. INTRODUCTION

1.1. Context of the Research

Various economic theories are presented in the literature that attempt to explain investor decision-making and behaviour. Standard Economic theory suggests that investors are rational, will make decisions based on all available information and will always maximise utility (Nagy & Obenberger,1994). Despite the underlying process that an investor follows in order to arrive at a specific investment decision and based on the premise that investors are rational beings, the investment decision will ultimately be determined utilising some sort of supporting piece of evidence or information.

Increased technological development and innovation together with the quick growth of the Internet has influenced corporate financial reporting practices as well as investor behaviour (Hanafi, Kasim, Ibrahim & Hancock, 2009). The Internet has changed the way investors acquire information and corporations communicate with stakeholders (Deller, Stubenrath, & Weber, 1999). While transferring data-files across the network, servers will track network communication in web-log files; these web-log files are able to provide information on each visit that is processed by the server (Rowbottom et al., 2005). Through utilising web-log data from companies that operate in a number of sectors in South Africa, this research aims to better understand the information requirements and behaviour of stakeholders as well as determine the ultimate effect that online integrated reporting will have on the publishing company's share price.

A number of studies have addressed how investors utilise the data of corporate reports when making investment decisions. Analysis of such studies indicate that there is no definitive conclusion as to what information is important to investors as well as the impact that the information has on the final investment decision. Examples of studies that illustrate this uncertainty and their respective outcomes are as follows; variables that rank significant to investors are wealth-maximising criteria (Nagy & Obenberger, 1994); non-financial environmental information is not important whereas financial environmental information is important (Moneva & Cuellar, 2009); there is no association between a share performance and its dissemination of environmental and social information (Murray, Sinclair, Power, & Gray, 2005); investors place value on the publication of individual sustainability reports (Bertholot, Coulmont & Serret, 2012)

and investors take into account factors of non-financial information when evaluating a company (Alnniacik, Alnniacik & Nurullah, 2011).

While there are a number of studies that have attempted to understand the value of specific reports or pieces of information to investors, “it has proven a difficult task to execute due to a lack of truly effective research methodologies and access to investor activity” (Rowbottom et al., 2005). A review of the current literature indicates that previous studies have been unable to truly understand investor behaviour and their information requirements due the inability of studies to apply effective research methodologies to the problem. Rowbottom et al. (2005) highlight the opportunity to utilise web-log data to better understand investor behaviour, their study describes the significant potential of utilising web-log data to measure and better understand the behaviour of online users. This study makes use of a dataset from 9 Johannesburg Stock Exchange listed corporates that operate across multiple sectors. Access to such a dataset is limited to a handful of companies due to the highly concentrated nature of the Investor Relations Industry in South Africa. The key purpose of this study is to utilise the web-log dataset and apply new research methodologies the problem, with the aim of closing the identified research gaps and developing new insights into investor behaviour and information requirements. The study further explores the behavioural differences between users from different industry sectors within South Africa.

Analysis of the literature indicates that no definitive consensus has been reached as to what the determinants of share price are. What is evident from the literature however, is that there are numerous factors that can and do effect the share price of a company. This study aims to build on this body of knowledge utilising the web-log dataset in order to generate insights of the impact of online integrated reporting on a company’s share price and more specifically which pieces of content within the online integrated report can have an impact on the company’s share price.

The execution of this study will thus enable the generation of a deeper understanding of the behaviour of stakeholders across multiple industries within the South African context. The insights generated will allow; executive management, investor relations departments, academics as well as policy-making entities to better align corporate reporting to stakeholder requirements. To the best of my knowledge no other study has

utilised such a dataset in order generate insight into investor behaviour specifically in relation to online integrated reporting. The privilege to have access to such a dataset and the opportunity to utilise the web-log dataset to analyse the user behaviour of Johannesburg Stock Exchange listed companies will be the key contribution to the body of literature.

The study is structured as follows; Section 1 provides context in terms of the problem statement, provides clear and concise research objectives and explores its limitations and significance. Section 2 details out the research methodology that was followed and describes its associated data and ethical issues. Section 3 presents the academic literature that is related to the theory of the investment-decision making process, triple-bottom-line reporting, online reporting trends and factors that affect share price; and provides empirical evidence of relevant studies for each of the theories presented. Section 4 presents the results of the Correspondence Analysis and Multiple Linear Regression. Section 5 includes a discussion of the results and relates the insights generated to previous studies that have been conducted. Section 6 provides a summary and conclusion of the study, provides key recommendations and explores any associated.

1.2. Problem Statement

The key problem area that this study addresses is understanding the information requirements of investors when making an investment decision. This study makes use of a web-log dataset that tracks online integrated report user behaviour, as this information is believed to be used in the investment decision making process. A number of studies have attempted to understand what information investors value when making investment decisions; these studies have typically utilised methodologies that capture data using questionnaires, simulation or observations in an experimental setting (Rowbottom et al., 2005). Whilst these studies have been able to gather important data and generate valuable insights into investor information requirements, these methodologies may lead to outcomes that are inaccurate due to the following reasons; data can become distorted due to the experimental setting, information is measured indirectly and the methodologies utilised measure what information investors actually demand as opposed to what information they perceive to require (Rowbottom et al., 2005). As a result of this, it has proved difficult to observe the

consumption of information by the various stakeholders. The progression of technology now provides an alternative means of measuring investor behaviour and has introduced new methodologies in which to investigate the importance of integrated reporting. This study aims to utilise web-log data to track actual behaviour as opposed to simulated behaviour and build on the body of work relating to investor information requirements that has previously been published.

The research will address 2 key sub-problems, each of which will contain a number of research objectives. The first sub-problem that the research addresses is that of investor behaviour and their information requirements when making an investment decision. The second sub-problem that the study addresses is understanding the impact of integrated online content on the publishing companies share price.

1.3. Research Objectives

Based on the problem statement presented and the associated sub-problems, the objectives of the study are to:

- Understand the information requirements of investors when making investment decisions.
- Understand how users engage with the content published in online integrated reports.
- Understand if the information requirements and behaviour of users across the industry sectors in South Africa are similar.
- Understand if pieces of content or sections published within online integrated reports are correlated to other pieces of information in the report. For example, if a user visited one page, are they also likely to visit some other part of the report?
- Understand the importance of the various sections that make up an integrated report and how users consume this information when engaging with the online document.
- Examine the impact of Online Integrated Reporting on a company's share price.
- Determine the effect, if any, of online integrated reporting on the publishing companies share price.
- Determine which sections of the online integrated report have the largest impact on the publishing companies share price.

1.4. Research Limitations

Whilst the methodology that has been applied to address the above-mentioned research objectives is adequate, there are a number limitations that are required to be noted. The key limitations include but are not limited to:

- There is no required structure to which online integrated reports are required to adhere to. The analysis required the manual categorisation of the sections of the report into predefined categories that are typically incorporated into reports. It must be noted that sections of reports could contain information pertaining to 2 or more categories which result in an overlap of content as a result of the categorisation process.
- As explained by Fisher (1986), causality of the variables that are investigated cannot be determined and are not explained by the coefficients of regression. In addition to this there are a large number of factors that have an impact on share price variation only some of which are explored in the regression model.

This study does not aim to be a prescriptive guide that describes to how listed companies should compile their online integrated reports, but rather it aims to begin to explore user behaviour and the importance of the online integrated report using web-log data and its associated quantitative methodology.

1.5. Significance of the Study

Research indicates that various studies have attempted to understand what factors or pieces of information are important to shareholders and potential investors when making an investment decision. The ability of these studies to arrive at truly meaningful insights has proved difficult due to the inability to apply effective research methodologies; studies of this type of nature have used traditional methods of collection such as surveys, questionnaires or observations in experimental settings in order to reach a conclusion (Rowbottom et al., 2005). In addition to this, Rowbottom et al. (2005, pg.32) state that “the methodology has significant potential in measuring the use of online Investor Relations information, and can therefore make valuable contributions to corporate reporting research and policy making”.

To the best of my knowledge, no studies have been conducted in a South African setting that utilise a similar data set and methodology as proposed above. The ability

to utilise web-log data across a number of clients and industries results in a unique set of results and insights that is relevant to a number of stakeholders in South Africa. Due to the fact that access to a such data-set is typically difficult to acquire, this study gives us the opportunity to truly build on the understanding of investor behaviour in a South African setting.

2. MATERIALS AND METHODS

2.1. Methodology

The study utilises a quantitative research approach in order to explore and better understand investor information requirements and behaviour. A secondary dataset consisting of online integrated report web-log data was provided by an Investor Relations focused company that designs, implements and maintains all aspects of JSE listed company integrated online reporting requirements. The quantitative methodology was chosen as the best suitable approach to achieve the objectives of the study for a number of reasons. The key reason for choosing such an approach is due to the fact that such a data-set is not typically available to the general public, the ability to utilise such a dataset for a number of companies that operate over various industry sectors in the country enables a number of deep insights related to investor information requirements and behaviour to be generated via a quantitative approach.

In order to better understand and assess investor behaviour and information requirements, this study will draw upon and build on the insights that have been produced by Rowbottom et al. (2005) in their study that explored the potential for studying the usage of investor relations information through the analysis of web server logs. The above-mentioned study focused on the number of page views and visits made to individual sections of an Annual Report and Financial Accounts section for a single company. This study aims to build on the work produced by Rowbottom's work by utilising data from a number of companies that operate in a number of industries in order to understand, compare and contrast investor information requirements and behaviour across different industry sectors.

2.2. Data Issues

The data utilised for the study was provided by a South African Investor Relations company. The Investor Relations company offers listed corporates a wide array of Investor Relations focused products. A key service offering of the company is the design, implementation and maintenance of integrated online reports for a large number of Johannesburg Stock Exchange listed companies in South Africa. The weblog data is stored on secure servers and is confidential in nature, the names of

companies have therefore not been included in the study. Data utilised in the study spanned 44 weeks and ranged from the 20th of October 2017 to 7th of August 2018.

This study makes use of historical web-log data in order to generate insights into user behaviour, information requirements and the effect of reporting on the publishing company's' share price. The data utilised was confined to web-log data from online integrated annual reports that have been published by companies that are listed on the Johannesburg Stock Exchange and operate in a number of sectors in South Africa.

For each of the identified clients, the following data was collected:

- **ClientDetails:** Client details captured include; client name, report details, client sector and the year that the integrated report was published.
- **ReportVisitID:** Every time that a specific web page is visited, a unique number known as the ReportVisitID is generated. The number that is generated is unique to each web-page that is visited.
- **UserID:** A session specific number known as a UserID is generated for each user that visits the integrated annual report. This UserID is unique to each visitor that accesses the integrated report for that specific session and enables the tracking of user movement between the pages of the report. Each ReportVisitID will therefore have an associated UserID.
- **URL:** The URL that is accessed by specific UserID is tracked and stored. Each web page has its own unique URL and is linked the UserID.
- **Section:** Each report is divided into number of key sections that enable the user to easily navigate between the content of the integrated annual report.
- **Title:** Each of sections are further divided into sub-sections known as titles. The titles of the web pages have been used in order to further categorise the content of the online integrated annual report.
- **Date and Time stamp:** The date and time that the UserID accessed the URL. The data includes; day, month, year and time of the visit to the specific web page.
- **User_Agent:** The User_Agent describes the device that was utilised to access the URL.
- **HTTP_Referer:** The previous URL that is associated with UserID visit is stored in order to document and better understand user journey.

The data was cleaned in order to ensure and enhance the reliability and validity of the research outcomes. The data retrieved from the database was cleaned to ensure that only valid data would be used in the analysis. The cleaning of data included; removing of any duplicate data, removing data from IP addresses that were associated with site development as well as the removing of data from IP addresses that are associated with internet crawlers.

2.3. Ensuring the reliability and validity of the research

A number of actions were taken in order to ensure the reliability and validity of the research. The measures that were taken include but are not limited to; the dataset that was chosen to be included in the study, the methodology in which the data was stored and collected; and the statistical methods that were chosen in order to analyse the data in order to reach conclusions.

The dataset that was utilised, included a number of JSE listed companies each of which consisted of a substantial number web-log database entries. This allows for the quantification of the impact of independent variables, the ability to ascertain statistical significance, the ability to capture a snapshot of the population as well as the ability make probabilistic inferences.

The data that was utilised was stored in a safe and secure server environment which ensured the integrity of the data prior to the analysis stage. The dataset that was pulled from the server was cleaned in order to further ensure and enhance the reliability and validity of the research outcomes. The cleaning of data included; removing of any duplicate data, removing data from IP addresses that were associated with site development as well as the removing of data from IP addresses that are associated with internet crawlers.

The methodology that was utilised to analyse the data was carefully chosen to ensure that the conclusions of the study are statistically significant and valid as well as to ensure that the outcomes of the analyses are aligned to the research questions

2.4. Ethical Issues

Ethical consideration was given to the sensitivity of the data that was utilised in the research. The data that was utilised is confidential in nature and is not available to the public, consent to use the data as part of the research was therefore requested and given by Investor Relations company. Possible unintended consequences of the project were considered and it was decided that the specific names of companies were not included in the report, instead the industries that they operate in are utilised.

2.5. Empirical Approach

Section 1.1 of this document identified 2 key research questions that the study aims to answer. In order to achieve this, a number of statistical methods have been applied to the data-set, the approach that has been taken and the specific tests that have been used are detailed out in the section below.

2.5.1. Investor informational requirements and behaviour

Correspondence Analysis

For this study, a Correspondence Analysis was utilised as a means of exploring associations between variables. The analysis aims to explore the association between the sections that are found within online integrated reports as well as the association of sections within the report with users from various industry sectors. The Correspondence Analysis is an exploratory tool that will generate insights that are related to the research questions resulting in a better understand of investor information requirements and behaviour. The aim of the correspondence analysis is twofold. Firstly, the analysis aims to explore the association between the key themes that are presented in integrated reports with the aim of developing insight into investor behaviour and an understanding of how users navigate through a report and consume information. Lastly, the Correspondence Analysis will develop insight in what types of content are important to users from each of the identified industry sectors.

A Correspondence Analysis was chosen as means to analyse the dataset as it allows researchers to reduce a complex data matrix into a simpler format without losing meaningful information (Kakai, Maskarinec, Shumay, & Tatsumura, 2003). In addition to simplifying the data, the Correspondence Analysis gives a visual representation of

the results, in which categories of variables with similar frequencies are placed as points clustered together in one space (Kakai et al., 2003).

The Correspondence Analysis utilised the 8 of the 9 web-log data sets. Whilst online integrated reports are not all structured in the same way, there are key themes that are typically included in each of the reports. In order to allow for the comparison across reports, key themes that are typically included in online integrated reports were identified and the content from each of the selected reports was categorised based on the key themes. The key themes identified include; About us; Business Model, Business Strategy, Downloads, Governance, Home, Leadership, Operational Performance, Remuneration, Shareholder Information, Sustainable Business, Value Creation and Company Financials which include the Statement of Comprehensive Income, Statement of Financial Position, Cash-Flow Statement, Statement of Changes in Equity and Financial Statement Notes. The descriptions of each of the categories and the type of content that is associated with each of the categories is as follows:

- **About Us:** The content of the about us section will give the user a general description of the company
- **Business Model:** The business model refers to content that describes how the company intends to generate revenue and profits, the intended customer base and its products
- **Business Strategy:** The business strategy section relates to all content that describes the strategic direction that the company intends to follow
- **Downloads:** Each HTML online integrated report will give the user the option to do download a PDF version of the HTML report. Links to PDF download will typically be found on the report landing page.
- **Governance:** Governance refers to content that relates to the policies that are in place and followed by the company that speak to how the company is governed.
- **Home:** The home page is the landing page of the report, it is the page that the user will typically start the user journey from. Companies will typically utilise the home page to display key messages that they would like the user to explore.
- **Leadership:** The leadership category includes content that relates to the executive leadership of the company and its board of directors

- **Operational Performance:** Operational performance relates to the operational performance of the company with particular reference to the performance of each of its business segments
- **Remuneration:** Remuneration provides information on the annual salaries of key personnel of the company as well as their bonuses that they received for the previous financial year.
- **Shareholder Information:** Shareholder Information relates in any information that includes but is not limited to; company shares in issue, majority shareholders, shareholder categories, geographic breakdown of shareholders and shareholder spread.
- **Sustainable Business:** Sustainable Business content relates to content that speaks to creating long-term stakeholders value.
- **Value Creation:** Value creation relates to content that describes how the company creates value for its shareholders and stakeholders. Value creation is typically described in terms of 'value' pillars or by how value is created for company stakeholders.
- **Cash-flow:** The cash-flow statement forms part of the financial reporting requirement of the company and relates to cash-flow that that a company receives as a result of its ongoing operations and the cash outflows that pay for its business activities
- **Equity:** The equity statement relates to the changes in equity in the statement of financial position
- **Financial Position:** The cash-flow statement forms part of the financial reporting requirement of the company and relates to the assets, liabilities and equity of a company.
- **Income:** The income statement forms part of the financial reporting requirement of the company and relates to the financial performance of a company in terms of revenue generated and expenses incurred.
- **Notes:** The notes form part of the financial reporting requirement and provide additional information pertaining to the company's financial statements

The content for the section and title categories were analysed and classified based on the above defined categories. The number of user visits for each of the categories were

tabulated across each of the 8 companies and a Correspondence Analysis was utilised to as a means to explore relationships

Correlation Analysis

In order to gain further insight into the behavioural patterns and informational requirements of users, a Correlation Analysis utilising a data-set of a company that was not included in the Correspondence Analysis was run. The Correlation Analysis was utilised in order build on the learnings of the Correspondence Analysis and better understand the statistical relationships between the sections of integrated annual reports. The data that was used was from a Johannesburg Stock Exchange listed company that operates in the food industry. The total visits for each of the sections were calculated on a weekly basis and spanned from the 20th of October 2017 to 7th of August 2018.

A Correlation Analysis was carried out in order to build on the learnings of the Correspondence Analysis with the aim of investigating if there is any statistical significance between the various sections of the online integrated annual reports. The hypothesis for the correlation analysis was as follows:

- H0: There is no (statistical significant) relationship between the various sections of the report (H0: p=0)
- H1: There is a (statistical significant) relationship between the various sections of the report (H0: p<>0)

2.5.2. Impact of Integrated Reporting on Share Price

Multiple Linear Regression Analysis

A Multiple Linear Regression was utilised to predict share price movements of a listed company based on the number of web site page views that the respective sections of the online integrated report receive. The data that was used was from a Johannesburg Stock Exchange listed company that operates in the Food industry. The particular company that was utilised was not chosen for any particular reason other than the fact that the web-log and share price data was available and that the company was not included in the Correspondence Analysis. The total visits for each of the sections were

calculated on a weekly basis and spanned from the 20th of October 2017 to 7th of August 2018.

The multiple linear regression model was chosen as it allows for predictive modelling and investigates the relationship between a dependent variable and a number of independent variables.

The hypothesis of the test is as follows:

- H0: The number of views that the various sections of the online integrated report receives, do not have an effect on the company share price and cannot be used to predict share price movements.
- H1: The number of views that the various sections of the online integrated report receive, have an effect on the company share price and can be used to predict share price movements.

3. THEORY

3.1. Theoretical Literature

This research article is based on 4 key areas of study; the study and understanding of the investor decision-making process, the study and understanding of Triple-Bottom-Line or Integrated Reporting, the study and understanding of the factors that affect the share price of a company and the effect and impact that technology is having on the corporate financial reporting industry. Each of these areas are presented as 4 separate sections below.

The first group of theoretical literature that relates to the study deals with the investor decision-making process. This theory will be utilised to answer the first problem statement and better understand user information requirements when making investment decisions. Standard Economic Utility Theory views an individual's investment decision as a trade-off between immediate and deferred consumption (Nagy & Obenberger,1994). Nagy and Obenberger (1994, p. 63) further state that an 'investor will weigh up the benefits of consuming today against the benefits that may be gained by investing the funds in order to enjoy greater consumption in the future'. According to this theory, investors will act on full information and the portfolio that is selected will maximise long-term satisfaction. Based on the Standard Economic utility theory, Von Nueman and Morgenstern (1947) further believe that investors are rational, are able to deal with complicated choices, are wealth maximising and risk sensitive. Alternative theories presented in the literature that attempt to describe the reasoning behind the investment decision process state that investors will seek investments that; maximise the mean of investment return, avoiding poor outcomes and alternatively making decisions without assumptions on probabilities or utility functions. Despite the underlying process that an investor would follow in order to make a specific investment decision; and based on the premise that investors are rational, a common thread amongst the theories presented is that the investment decision will ultimately be determined utilising some sort of supporting piece of evidence or information.

The second group of theoretical literature that is essential to the understanding of the study, is that of Triple-Bottom-Line Reporting. The theory of Triple-Bottom-Reporting

will add an additional layer of theory to the research that will be utilised in answering the first research problem thus building a deeper and more intricate understanding of user information requirements when making investment decisions. Multiple views are presented in the literature that describes the theory of a firm; with each view having a different implication for reporting on organisational performance (Hubbard, 2006). Shareholder theory views the firm as being owned by the shareholders and utilises shareholder return to measure the overall firm performance (Friedman, 1962). Friedman (1970, p. 34) states that "there is one, and only one social responsibility of a business; to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game". Milton believed that a company's only social responsibility is to increase profits for the owners or shareholders. Stakeholder theory is a relatively newer view of a firm and was introduced into the literature by Edward Freeman. Freeman (1984) takes the view that a company has responsibilities to a greater group rather than simply its shareholders. Company stakeholders include; customers, employees, governments, suppliers, industry bodies and communities (Freeman, 1984). Stakeholder theory assesses organisation performance against the expectation of a variety of stakeholder groups that have a particular interest in organisation activities. The concept of Triple Bottom Line reporting dates back to the mid 1990's and was initially introduced into the literature by John Elkington in his book, Cannibals with Forks: The Triple-Bottom-Line of 21st Century Business. The concept of Triple-Bottom-Line reporting is based on stakeholder theory, but takes a much wider perspective of the stakeholders affected by the organisation. The concept is based on the fact that a corporation's ultimate success can and should be measured not just by the traditional financial bottom line, but also by its social, ethical and environmental performance (Elkington, 1998).

The third group of theoretical literature that is essential to understand relates to understanding the factors that will typically affect the share price of a company. The theories presented in this section will be utilised and built upon in order to answer the second research question, understanding the impact of online integrated reporting on the publishing companies share price. Various theories have been presented and discussed within the literature, however, no consensus has been reached from both a theoretical as well as empirical point of view as to what the determinants of share prices are (Gatua, 2013). Fisher (1986; p. 530) states that "There is no single factor that

causes stock prices to stray from theoretical values, nor even a small number of factors and there is no simple single or multiple factor explanation of domestic or international business fluctuations". Factors affecting share prices are numerous and can be categorised into firm, industry, market or non-market or economic or non-economic and can be summarised into two classes; micro-economic and macro-economic factors (Gatua, 2013).

Gan, Lee, Yong, and Zhang (2006) believe that share prices are determined by fundamental macro-economic variables such as exchange rate, interest rate, and inflation rates. However, as explained by (Fisher, 1986), economic studies involving economic variables are hard to interpret for 2 reasons; firstly, the coefficients of regression tell us little about causal relations even when the variables are observable; and secondly, the variables are subject to lots of measurement error. Fisher (1986) further believes that noise makes it difficult for either practical or academic theories to accurately describe the way that financial or economic markets really work, stating that we are in fact "forced to act largely in the dark". With this being said, multiple studies have been conducted with the aim of quantifying the effect of specific variables on a company's share price. Various studies, which are presented in the empirical literature section, have been completed which allude to the fact that macro-economic factors in fact do affect share price, these macro-economic include; Inflation Rate, Exchange Rate, Gross Domestic Product, Money Supply and Interest Rate (Mayasmai & Koh, 2000); Gupta, Chevailier & Sayekt, 2001; Geske & Roll, 1983; Chen, Roll & Ross, 1986).

The fourth group of theoretical literature that is essential to understand and relates to the study is the impact that technology is having on the corporate communications industry. Traditional instruments utilised by the Investor Relations function include; the corporate report, the interim report, the annual general meeting, press and financial analyst conferences, one-on-one discussions as well as conference calls (Deller, Stubenrath, & Weber, 1999). Traditional corporate financial practices and instruments have significantly been influenced by new technology and the growth of the Internet around the globe (Hanafi et al., 2009). Rowbottom et al. (2005) believe that this is because the Internet has greater reach and is able to automate the provision of specific investor relation's services. Further to this, Rowbottom et al. (2005) state that "rapid

communication of information at low marginal costs allow corporate reports to be available to a user as and when they need it". Ince (2017) are in agreement with this and believe that the technology enables users to access information that is tailored to their requirements. Xiao, John and Lymer (2010) believe that the internet is increasingly used by companies to disseminate financial information, their research indicates that whilst some experts foresee minimum changes in financial reporting over the short-term, others have adopted a more progressive or radical view. The research further indicates that increased effort and resources are being redirected to the online medium whilst the traditional print reporting format is being stripped back in terms of both narrative and design elements.

Rowbottom et al. (2005) conclude that measuring Investor Relations output, including annual financial reports has proven a difficult task in the past due to a lack of truly effective research methodologies to access such activity. Their paper indicates that the methodology of utilising web-log files has the ability to measure what type of information is accessed by users and will be able to make valuable contributions to the body of knowledge that has already been generated.

Whilst an understanding of each of the above-mentioned sections is required in order to build a knowledge base from which generate insights into the behavioural elements and information requirements of investors, the key theory that is closely related to the problem statement is that of investor decision making process.

3.2. Empirical Literature

Rowbotom and Allam (2005 p.2) state that "no study provides data on what information is actually accessed by investors". A number of authors have addressed the use of reporting as well as the usefulness of other corporate data, these studies, however, generally capture data by employing methodologies that utilise questionnaires, simulation or observations in an experimental setting. Examples of such studies include that of Nagy and Obenberger (1994) who focused on determining the relative importance of variables to individuals making investment decisions. The study found that the variables that were significant were general wealth-maximising categories such as; expected earnings, diversification of needs and risk minimisation. In addition, the study concluded that investors utilise a number of factors when making a decision

on which shares to purchase, concerns such as a company's ethical belief and environmental history are given minimal consideration by professional share investors. Since its introduction, the concept of Triple-Bottom-Line reporting has become increasingly popular within the academic and business community. Despite this popularity, there are still a number of authors who believe that the rhetoric is misleading and may provide a smokescreen behind which firms can avoid truly effective social and environmental reporting and performance (MacDonald & Norman, 2004). Multiple empirical studies have been carried out that attempt to shed light on the topic in order to better understand the concept. Research within the literature indicates that there is no clear answer as to the effectiveness of utilising Triple-Bottom-Reporting as part of a corporations information dissemination strategy, Moneva and Cuellar (2009) explored the relevance of both non-financial and financial environmental reporting disclosed in the annual reports of companies listed on the Madrid Stock exchange during the period 1996-2004, results indicate that non-financial environmental disclosures are not relevant, however, financial environmental information is. The study also found that there is a relation between environmental reporting and financial performance in the Spanish context. Murray et al. (2005) explored whether investors in the UK show any discernible reaction to the environmental and social disclosures made by the top 100 companies selected from the Times 1,000 based on turnover as a metric. Results indicate that no relationship of any kind was found between the company's share price performance and its release of environmental and social information.

Despite the negative views provided by particular authors, there are a number of empirical studies that indicate value in such reporting. Bertholot et al. (2012) explored whether investors place significance the publication of individual sustainability reports, utilising a sample of Canadian companies that were listed on the Toronto Stock exchange. The results indicate that investors attach a positive value to the publication of such reports. Alnniacik et al. (2011) indicate that investors take into account factors of non-financial information when evaluating a company. In the study that was carried out, a number of factors including but not limited to the intention to purchase products, intention to purchase products from, pursue employment and invest in a particular company were evaluated.

The results indicate that positive Corporate Social Responsibility information about a company increases a consumers' intention to; purchase products from the company, seek employment with the company and increase the likeliness of investors to invest in the company. Wahba (2008) demonstrated that the market rewards firms for their environmental consciousness, as Corporate Environmental Responsibility exerted a positive and significant coefficient on the firm market value

A number of empirical studies have been conducted in which the effect of macro-economic factors on a company's share price was investigated. Mukherjee & Naka (1995) indicated that the stock market in Japan is co-integrated with six macro-economic variables namely; money supply, exchange rate, inflation rate, industrial production, the short term call money rate and long term government bond rate. Gupta et al. (2001) examined the relationship between the interest rate, exchange rate and stock price in the Jakarta stock exchange for the period 1993 to 1997 which was divided into three sub periods (January 1993 to March 1995, April 1995 to July 1997 and August 1997 to December 1997). Depending on the sub periods being considered, sporadic un-directional causality from closing stock prices to interest rates and vice versa and weak un-directional causality from exchange rate to stock price were found. Geske and Roll (1983) found that the UA share price is negatively associated to the inflation rate and positively associated to real economic activity. Mukherjee and Naka (1995) found that the stock market in Japan is correlated with six macroeconomic variables namely; exchange rate, money supply, inflation rate, long term government bond rate, industrial production, and the short-term call money rate. Chen et al. (1986) utilised macro-economic variables to describe share return in the share market in the US, the research indicated that changes in risk premiums, industrial production and changes in term structure are positively associated to the share returns, while both the unanticipated and anticipated inflation rates are negatively related to the share return. Chen et al. (1986) conclude macro-economic variables are causally related to share returns

A number of studies have highlighted an increase in the quantity of corporates that utilise the internet to disclose and disseminate information to stakeholders (Rowbottom et al., 2005). A number of empirical studies have been carried out that attempt to better understand the information requirements of both professional and non-professional

investors when accessing online reports. Hodge and Pronk (2003) assessed the difference of how professional and non-professional investors utilised corporate report information in their investment decision-making process. In addition to this, they investigated the difference in the way information is consumed in different situations, namely when researching a new investment as well as evaluating a current investment. The results indicate that professional investors will utililse PDF reports and focus on the financial statements. Non-professional investors will utilise HTML-formatted reports and focus on management's discussion of the general results.

The key hypotheses tested relate to the impact that integrated reporting has on a company's share price as well as the behavioural patterns and informational requirements of report users. A multiple linear regression test is utilised to test the impact of integrated reporting on the share price, with the null hypothesis being that the number section report views will not have an effect on the company's share price and cannot be used to predict share movements. A correlation analysis is utilised to gain further insight into user behaviour with the of better understanding how users consume report information, with the null hypothesis being that there is not statistical relationship between the various section of the report.

4. RESULTS

4.1. Investor Information and Behavioral Requirements

A Correspondence Analysis was utilised as an exploratory model in order to better understand investor information and behavioural requirements. The variables used in the analysis include the number of page views for each of the respective categories of the reports, the number of views for each category were measured in their raw state for the specified time range. The Correspondence Analysis indicates that there are 3 key clusters amongst the 17 variables. The distance between any row points or column points gives a measure of their similarity or dissimilarity (STHDA, 2018), the quadrants and their respective clusters are analysed in further detail below taking these distances into consideration. The analysis that follows includes a description of the results in terms of category data, company data as well as a combined analysis that includes both category and company data. For a detailed view of the results of the Correspondence Analysis, please refer to table 8 in the appendix.

4.1.1. Analysis of Category Data

Figure 1 below illustrates the 4 quadrants and the 3 key clusters that have been identified as a result of the associations between the category variables. Each of quadrants and its associated cluster have been described based on variable attributes as well as their placement along the axes. The 4 quadrants that have been identified include; “Financial”, “Navigation”, “What are we About?” and “Company Operations”. Each of the quadrants are explored in further detail below.

Quadrant 1 – “Financial”: The top right quadrant entitled “Financial” consists of 9 of the 17 variable categories. The 9 category variables that form the cluster include; Governance, Leadership, Cash-flow, Shareholder information, Equity, Business model, Value creation, Financial position and Income. The category variables that form the cluster include content that relates strongly to company strategy and financial information. The association of these category variables within the upper right quadrant indicates that integrated report users will relate or link content that communicates information about company strategy and financial results. Further analysis of the strategic intent cluster indicates that; content relating to company financials is strongly related, content that relates to the business model with shareholder information, equity and company cash flow.

Quadrant 2 – “Navigation”: The bottom-right quadrant entitled “Navigation” consists of 4 of the 17 variable categories. The 4 category variables that form the cluster include; Business strategy, Home, Remuneration and Downloads. Further analysis of cluster variables indicates that users relate content of the home page with remuneration and business strategy content. The results indicate that whilst there is a behavioural link between the home page and downloads, it is not as robust when compared to its link with business strategy and remuneration. The category variables that form the Navigation cluster include content that relates strongly to users’ navigation behaviour. The home page is the landing page of the online integrated report, the association of category variables indicates that users require direct links to content for PDF downloads, remuneration reports and business strategy once landing on the home page of the online integrated report.

Quadrant 3 – "What Are We About?": The bottom-left quadrant entitled "What Are We About?" consists of 2 of the 17 category variables. The category variables that form the cluster include; Sustainable Business and About us. The association of category variables indicate that users associate content that describes the company with its future business sustainability.

Quadrant 4 – "Company Operations": The top-left quadrant entitled "Company Operation" consists of 2 of the 17 category variables. The category variables within the cluster include; Operational Performance and Notes. The operational performance of a company refers to the performance of its key segments. The analysis indicates that despite being weak, there is an association between the operational performance content and financial statement notes.

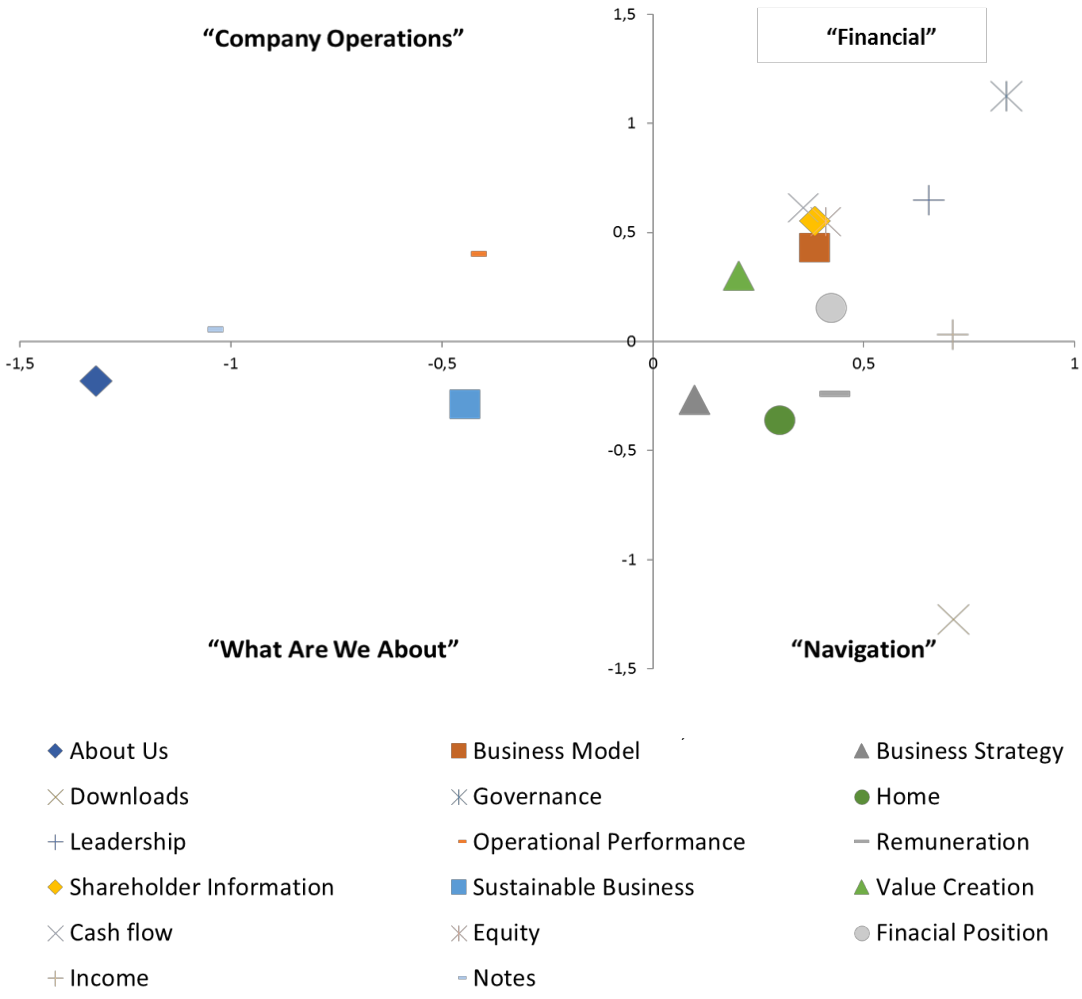


Figure 1: Correspondence Analysis of Category Data

(Source: Anthony Stacey)

4.1.2. Analysis of Company Data

The correspondence analysis indicates that users from companies fall within 3 of 4 identified quadrants. The companies that fall into the “Financial” quadrant include companies that operate within the Diversified Industrials, Telecoms, Real Estate and General Industrials industry. The companies that fall into the “Navigation” quadrant include companies that operate within the Support Services and Food Producing industries. Users from the pharmaceuticals industry falls into the “Company Operations” quadrant

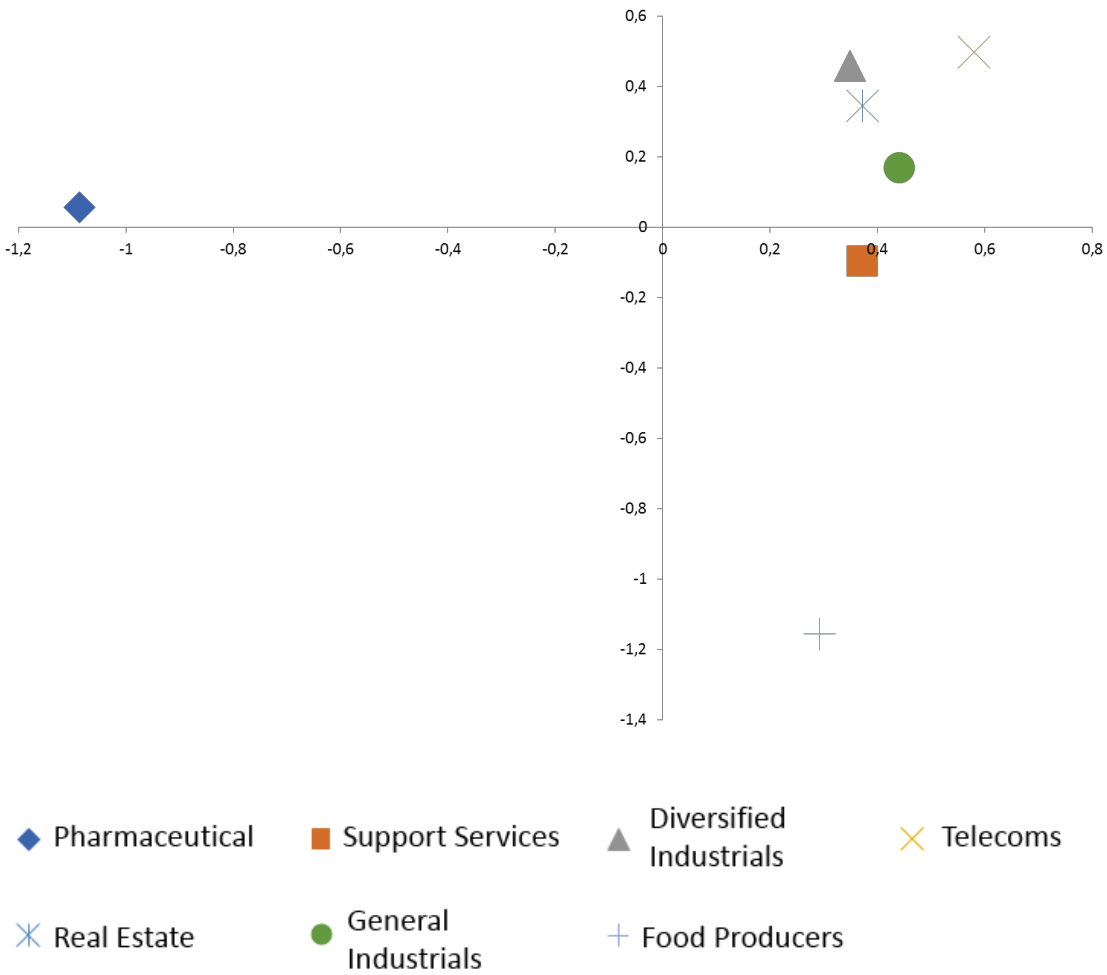


Figure 2: Correspondence Analysis of Company Data

(Source Anthony Stacey)

4.1.3. Chart Overlay

The correspondence analysis enables you to gain a deeper understanding of the data by overlaying the data from each of the graphs over one other. Figure 3 below illustrates the overlaying of company and category data.

Quadrant 1 – "Financial": Overlaying of the data indicates that there is an association between online integrated report users from the telecoms, services, real estate and general industrials industries with "Financial" category variables; namely; Governance, Leadership, Cash-flow, Shareholder information, Equity, Business model, Value creation, Financial position and Income.

Quadrant 2 – "Navigation": Overlaying of the data indicates that there is an association between online integrated report users from the support services and food processing industry with "Navigation" category variables; namely Business strategy, Home, Remuneration and Downloads

Quadrant 4 – "Company Operations": Overlaying of the data indicates that there is an association between online integrated report users from Pharmaceutical industry with "Company Operations" category variables; namely; Operational Performance and Notes

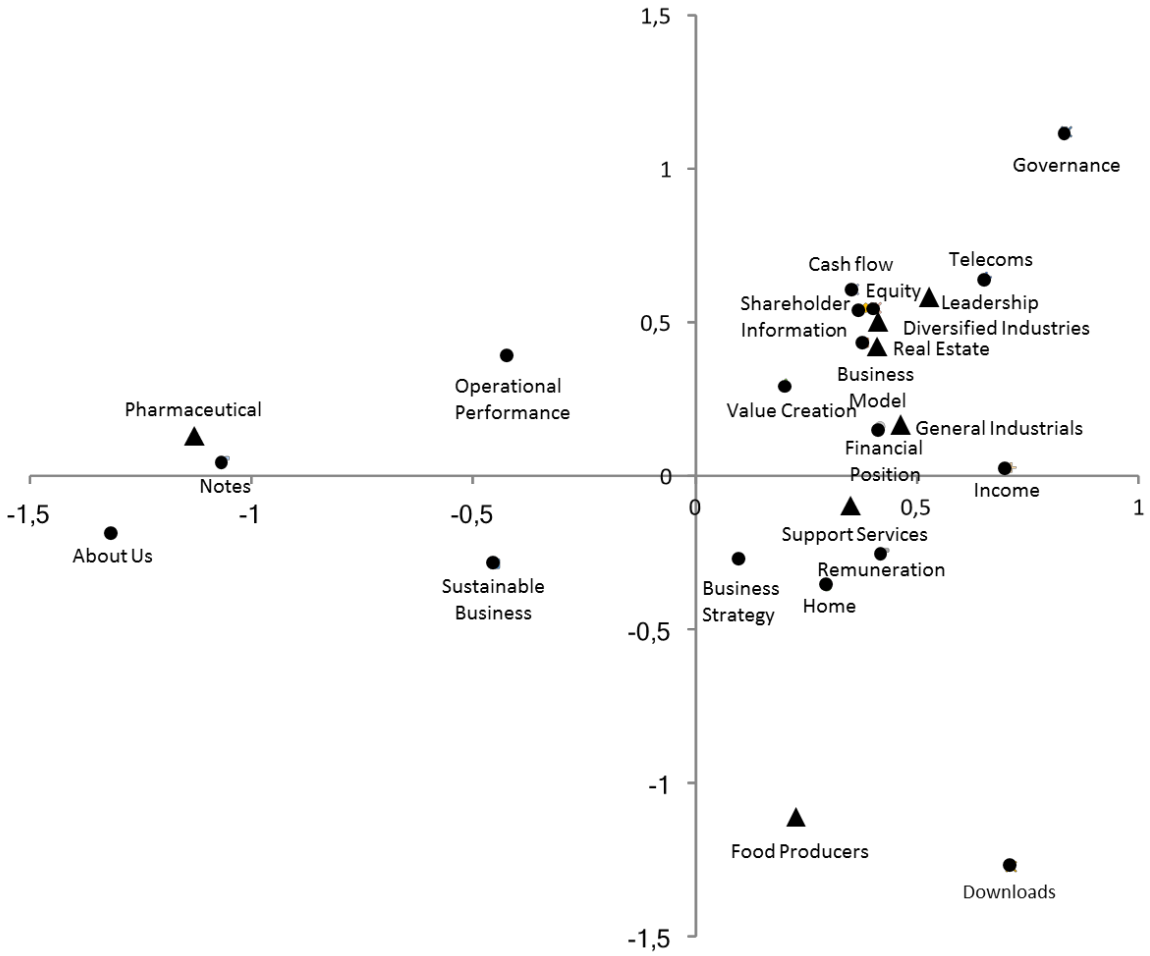


Figure 3: Correspondence Analysis of Company and Category Data

(Source: Anthony Stacey: Adapted based on figure 1 and 2)

4.2. Correlation Analysis Results:

StatPlus for Apple was utilised to generate the results presented in Table 1. The correlation between the number of page views, between each of the 8 sections of the of online integrated reports were computed over the specified date range; the results indicate 17 out of the 28 possible correlations were statistically significant at the 5% level ($p<0.05$). In general, the results are consistent with the outcome of the Correspondence Analysis and indicate that the home page of the online integrated annual report is correlated with number of PDF downloads of the report. The analysis also indicates that the other sections of the report are correlated with each other with the Financial sections having the highest correlation with the Governance and Group Review sections.

Correlation Coefficients Matrix

		Annexure A	Annexure B	Divisional Reviews	Downloads	nancial Statemen	overnance Revie	Group Review	Home	Grand Total
Annexure A	**R**	**1,**								
	R Standard Error									
	t									
	p-value									
	H0 (5%)									
Annexure B	**R**	**0,92227**	**1,**							
	R Standard Error	0,00356								
	t	15,46242								
	p-value	6,50521E-19								
	H0 (5%)	*rejected*								
Divisional Reviews	**R**	**0,90021**	**0,82671**	**1,**						
	R Standard Error	0,00451	0,00754							
	t	13,3975	9,52261							
	p-value	9,25909E-17	4,73401E-12							
	H0 (5%)	*rejected*	*rejected*							
Downloads	**R**	**0,07355**	**0,111**	**-0,09484**	**1,**					
	R Standard Error	0,02368	0,02352	0,0236						
	t	0,47793	0,72382	-0,6174						
	p-value	0,63518	0,47319	0,54031						
	H0 (5%)	*accepted*	*accepted*	*accepted*						
Financial Statements	**R**	**0,96094**	**0,92359**	**0,91788**	**0,11469**	**1,**				
	R Standard Error	0,00182	0,0035	0,00375	0,0235					
	t	22,50279	15,61218	14,98899	0,74823					
	p-value	0,E+0	4,33681E-19	1,84314E-18	0,45849					
	H0 (5%)	*rejected*	*rejected*	*rejected*	*accepted*					
Governance Review	**R**	**0,89346**	**0,83496**	**0,89905**	**0,05151**	**0,93028**	**1,**			
	R Standard Error	0,0048	0,00721	0,00456	0,02375	0,0032				
	t	12,89155	9,83295	13,30692	0,33424	16,43374				
	p-value	3,42499E-16	1,85082E-12	1,16769E-16	0,73986	1,0842E-19				
	H0 (5%)	*rejected*	*rejected*	*rejected*	*accepted*	*rejected*				
Group Review	**R**	**0,92445**	**0,86212**	**0,87788**	**0,20414**	**0,93431**	**0,90719**	**1,**		
	R Standard Error	0,00346	0,00611	0,00546	0,02282	0,00303	0,00421			
	t	15,71251	11,02672	11,88015	1,35144	16,9858	13,97449			
	p-value	3,25261E-19	5,60071E-14	5,14389E-15	0,18379	0,E+0	2,1684E-17			
	H0 (5%)	*rejected*	*rejected*	*rejected*	*accepted*	*rejected*	*rejected*			
Home	**R**	**0,16051**	**0,17399**	**0,00237**	**0,94471**	**0,18662**	**0,15942**	**0,31966**	**1,**	
	R Standard Error	0,0232	0,02309	0,02381	0,00256	0,02298	0,0232	0,02138		
	t	1,05387	1,14507	0,01537	18,67148	1,23106	1,04652	2,18633		
	p-value	0,29797	0,25866	0,98781	0,E+0	0,22515	0,30131	0,03442		
	H0 (5%)	*accepted*	*accepted*	*accepted*	*rejected*	*accepted*	*accepted*	*rejected*		

Table 1: Correlation Analysis

Notes:

R = Correlation Coefficient
H0: Variable pairs are not correlated. Thus when rejecting (P<0.005) there will be a correlation between variables
Annexure A: Interest in subsidiaries, associates and jointly controlled entity
Annexure B: 2016 pro forma financial information of the food processing company (BC) Group / Headline earnings as at June 30 2016 / Notes to the pro forma statement of comprehensive income

4.3. Regression Analysis Results

A multiple linear regression test was run utilising StatPlus for Apple. The multiple linear regression was calculated to predict a company's share price based on the number of views the various sections of its online integrated report receives. The hypotheses for the analysis were as follows:

- H0: The number of views that the various sections of the online integrated report receives, does not have an effect on the company share price and cannot be used to predict share price movements.
- H1: The number of views that the various sections of the online integrated report receives, has an effect on the company share price and can be used to predict share price movements.

Table 2 below shows the results of the regression analysis. A significant regression equation was found ($F(8,35) = 7{,}48$, $p < 0{,}000$), with an R^2 of .631. The company's share price is equal to:

$$SP = 28.10 - 0.07A + 0.01B - 0.07DR - 0.00D - 0.00FS + 0.07GR + 0.03GRR + 0.01H$$

Where:

SP = Share Price

A = Annexure A (Interest in subsidiaries, associates and jointly controlled entities)

B = Annexure B (2016 Pro forma financial information)

DR = Divisional Reviews

D = Downloads

FS = Financial Statements

GR = Governance Review

GRR = Group Review

H = Home

The dependent variable, Share Price, is measured in South African Rands and the independent variables are measured in number of page views.

The ANOVA results suggest that there is sufficient evidence to reject the null hypothesis in favour of the alternative hypothesis with F(7,48) and P<.05. Results indicate that the linear regression model is valid, however, no variable is significantly related to share price other than divisional reviews (P=.0007). The negative sign indicates that share price and divisional review views have an inverse relationship, implying that an increase in the company's divisional reviews visits will lead to a decline in the share price. The variables with positive coefficients suggest a positive impact on the share price, but not significant. Lack of significance suggests that one cannot put emphasis on the importance of these variables as determinants of share price.

Relatively large coefficients dictate that for a small change in a particular variable, there is a relatively large change in the share price. The results of the regression analysis indicate the coefficients for each of the independent variables are significantly smaller when compared to the intercept, indicating that there are a number of other variables that have not been measured in the analysis that will impact on the share price.

The R-Squared value is a measure of the usefulness of the regression model and measures the proportion in the variability of the dependent variable that is measured by the regression model. The adjusted R-squared value takes the number of variables into account and describes how fluctuations in the number integrated report views affects share price, results indicate the adjusted R-squared value is 0.55 and indicates that integrate report views explain slightly more than half of the variation (55%) in share price.

Results of the Regression Analysis and ANOVA thus indicate that the regression model is valid and that divisional reviews has a significant impact (p<.05), concluding that variations in share price are somewhat explained by the variation in divisional review visits.

Regression Analysis:

Linear Regression							
Regression Statistics							
R	0,79443						
R-Squared	0,63111						
Adjusted R-Squared	0,54679						
S	1,06833						
MSE	1,14134						
RMSE	1,06833						
MAPE	2,62589						
DW	0,95052						
PRESS	67,78563						
PRESS RMSE	1,2412						
Predicted R-Squared	0,37403						
N	44						

Share Price = 28,10287 - 0,06532 * Annexure A + 0,01348 * Annexure B - 0,06576 * Divisional Reviews - 0,00022 * Downloads - 0,00087 * Financial Statements + 0,07255 * Governance Review + 0,03319 * Group Review + 0,01326 * Home

ANOVA							
	d.f.	*SS*	*MS*	*F*	*p-value*		
Regression	8,	68,34293	8,54287	7,48495	8,98328E-6		
Residual	35,	39,94687	1,14134				
Total	43,	108,2898					
	Coefficient	*Standard Error*	*LCL*	*UCL*	*t Stat*	*p-value*	*H0 (5%)*
Intercept	28,10287	0,46809	27,15259	29,05316	60,03675	0,	*rejected*
Annexure A	-0,06532	0,17747	-0,4256	0,29495	-0,36808	0,71503	*accepted*
Annexure B	0,01348	0,02429	-0,03584	0,06279	0,55479	0,58257	*accepted*
Divisional Reviews	-0,06576	0,01786	-0,10202	-0,0295	-3,68167	0,00078	*rejected*
Downloads	-0,00022	0,01709	-0,03491	0,03448	-0,0127	0,98994	*accepted*
Financial Statements	-0,00087	0,01207	-0,02537	0,02363	-0,07225	0,94281	*accepted*
Governance Review	0,07255	0,05199	-0,03299	0,17809	1,39561	0,17162	*accepted*
Group Review	0,03319	0,02198	-0,01143	0,07781	1,51024	0,13996	*accepted*
Home	0,01326	0,01295	-0,01303	0,03955	1,02422	0,31276	*accepted*
T (5%)	2,03011						

F= F Statistic
MS = Mean Square
d.f. = Degrees of freedom
SS = Sum of Squares
LCL = Lower limit of the 95% confidence interval
UCL = Upper limit of the 95% confidence interval
R = Correlation Coefficient
MSE = Mean Squared Error
TOL = Not Applicable
VIF = Not Applicable

5. DISCUSSION

5.1. User Information Requirements and Behaviour

5.1.1. Interpretation of results

A Correspondence Analysis and Correlation Analysis were utilised in order to better understand how users interact with integrated online reporting content across a number of industries in South Africa. This section will analyse the findings of the research, link results with the original problem statement and understand how the research compares with previous studies that have been published. Finally, the implications of the outcomes to policy makers, academics, companies and Investor Relations companies will be explored.

Correspondence Analysis

The Correspondence Analysis identified 3 key clusters that describe the behaviour in which users engage with the content of online integrated reports. The key clusters that describe this behaviour include; the “Financial” cluster, the “Navigation” cluster and the “What Are We About?” cluster.

Analysis of the financial cluster indicates that Governance, Leadership, Cash-flow, Shareholder Information, Equity, Business model, Value creation, Financial position and Income are pieces of content within online integrated reports that are closely associated to each other. The category variables that form the cluster include content that relates strongly to key business metrics and their association with the various types of financial information that are available. The association of category variables indicates that users will associate the identified business metrics with the financial information that has been presented. The analysis further indicates that that this type of behaviour is specifically associated with users from real estate, diversified industrials, general industrials and telecoms industries. Multiple studies have been carried out with the aim of trying to better understand what information is important to investors, with the emphasis being on trying to understand the importance compared to financial information. The results of such studies are inconclusive and show varying results. The methodology employed in this study takes a slightly different approach which results in the generation of insights that are different from the typical outcomes.

Whilst this study does not place values on the importance of financial information compared to non-financial information, insights are generated that indicate that specific content is associated with financial information and it may not be the financial information alone that impacts on investor decisions. The analysis generates insights into what information is important as well as how users engage with the reports. There is no required structure to which online integrated reports are required to adhere to, it is therefore important that companies understand the information and behavioural requirements of users within their specific industries and design formats which enable users to easily navigate through the information in way that makes logical sense based on their requirements.

Analysis of the navigation cluster indicates that 4 key variables namely; Business Strategy, Home, Remuneration and Downloads form a cluster in the bottom right quadrant. The category variables that form the cluster include variables that describe user behaviour in terms of navigation and how users initially interact with the online integrated annual report. The analysis further indicates that that this type of behaviour is specifically associated with users from the food producing and support services industries. One of the key areas of the problem statement that the study aims to address is to better understand user behaviour and how they engage with content of online integrated reports. Interpretation of results indicate that there are 2 types of users that will utilise online integrated reports, those that utilise the home page to navigate towards downloading the PDF document and those that utilise the HTML indexed reports. The home page of the integrated annual report enables companies to present their most important pieces of information to users. The association amongst these category variables reveals the key areas of content that are associated with the home page and are thus important users includes content that relates strongly with the organisational strategy, remuneration and access to PDF downloads. Various communication techniques are available to organisations to enable them to better communicate with stakeholders. Modern techniques that have recently started to be included in online integrated reporting includes; making use of video and sound, animations and programming that allows users to better engage with the content. The results of the Correspondence Analysis provides insight as to the type of content that companies need to focus of when developing the home page. In addition to the type of content that can be included on the home page, insights generated from the analysis

will assist designers with the development of user journeys to enrich and improve the users experience by providing easy to navigate links to the correct type of content.

Analysis of the “What Are We About?” quadrant indicates that sustainable business and About Us are pieces of content within online integrated reports that are closely associated with each other. The category variables form a cluster in which content that relates to information about the company and future business sustainably is associated. The results further indicate that no industry is specifically associated with the quadrant in question. The results of the analysis indicates that no specific industries are associated with sustainability content in the online integrated annual report.

Analysis of the “Operational” quadrant indicates that financial notes and operational performance are pieces of content that are associated, and that these pieces of content are particularly associated with the pharmaceuticals industry.

Correlation Analysis

Results from the correlation analysis are consistent with the findings of the correspondence analysis. The analysis indicates that the correlation between home page views, PDF downloads and the group review sections of the online integrated report is statistical significant. The analysis further indicates that the correlation between the other sections of the online integrated report are statistically significant. The results suggest that there are 2 groups of users that utilise the online integrated reports, those that prefer to download the PDF as a source of information and those that will utilise the HTML web-pages to navigate through the report in order to search for the required information. These findings are in line with Hodge and Pronk (2003) who explain that’s professional investors will typically make use of PDF documents where-as non-professional investors tend to make use of HTML pages.

5.1.2. Implication of Results

Results of the Correspondence Analysis and Correlation Analysis speak to user behaviour and the way in which users engage with the content that is published in the online integrated report. The insights that have been generated from the study will therefore have an impact on; Investor Relations departments in terms of how the content of reports are structured, designer studios in terms of how the user experience

and sitemap is developed, academics in terms how web-log data studies can be utilised in future studies and executive management in terms of developing and reporting on strategies that are in line with the requirements of company stakeholders.

When designing and developing the sitemap, it is important that a user journey is created that allows for easy navigation between related sections of the report. More specifically, it is important that cluster variables are considered and that information is to compiled in such a way in which users are able to navigate between associated content sections. In order to achieve this, navigation links between the associated financial and non-financial sections of the report can be used to facilitate the movement between associated sections.

Key insights drawn from the study in terms of the home page is that institutional investors will utilise the home page to access PDF versions of the report whilst non-professional investors will utilise the home page as starting point from which begin their journey through the HTML content. Companies must therefore design the home pages of their reports in such a way that not only are the PDF downloads easily accessible but that the home page content is marketed towards both the institutional and retail investors. The HTML pages on the other hand are to be developed in such a manner that the content is more directed towards the retail investor. Various online tools are available that enable the general retail investor to better understand and utilise the information within the online report.

The Correspondence Analysis indicated that specific pieces of content are more important depending on the type of industry. It is important for those parties who are responsible for compiling the integrated online report understand which sections are important for their specific industry and develop a report in which user can easily engage with the specific content.

5.2. The Effect of Integrated Reporting on the Share-Price

5.2.1. Interpretation of Results

Results of the Regression Analysis indicates that the regression model is valid and suggests that variations in share price are somewhat explained by the variation in divisional review visits. The section that follows will analyse these results in further detail, link results to the research objectives, understand the output relative to previous

studies that have been completed and offer possible explanations for any similarities or differences.

The results of the regression analysis indicate the coefficients for each of the independent variables are significantly smaller when compared to the intercept value, this indicates that there are a number of other factors that have not been incorporated into the model that impact share price movement.

The literature indicates that no definitive consensus has been reached as to what the determinants of share price are. What is evident from the research, is that there are numerous factors both macro-economic and micro-economic that can and do effect the share price. Fisher (1986) explained that economic studies involving economic variables are hard to interpret as causal relations are difficult to establish and that the variables that are studied are subject to measurement error. Despite this, numerous studies have been carried out with the intention of better understanding the effect of macro-economic and micro-economic factors on a company's share price. The literature presents multiple studies that attempt to better understand the effect of macro-economic factors on a company's share price. The results of such studies indicate that macro-economic factors do in fact have an impact on a company's share price, more specifically; Gupta et al. (2001) and Mukherjee and Naka (1995) indicate that exchange rates impact a company's share price; Geske and Roll (1983), Mukherjee and Naka (1995) and Chen et al. (1986) indicate that inflation rates impact a company's share price; Gupta et al. (2001) also indicate that interest rate impact a company's share price and Geske and Roll (1983) indicate that GDP will impact on a company's share price. Other factors identified by authors such as Mayasmai and Koh (2000) and Chen et al. (1986) include; industrial production, changes in risk premiums, and changes in the term structure to be positively related to the expected stock returns.

The results of the are regression analysis are consistent with the above-mentioned studies as results indicate that the key determinant of a company's share price is not in fact the content that is published in the integrated report but rather other factors which may include the above-mentioned macro-economic factors. One of the key objectives of the research was to determine the effect, if any of online integrated reporting on the publishing companies share price. The analysis indicates that compared to other factors, the integrated report will have little to no effect on share

price movement. Integrated annual reports can be published up to 6 months after financial results are published. A possible reason for the small impact of the report on share price is that market information is already built into the share price, that fact that the company releases the publication will therefore have little impact on the share price.

The second objective of the research was to determine which sections of the online integrated report have the largest impact on the publishing companies share price. The results of the analysis indicate that no variable is significantly related to share price other than divisional reviews.

Multiple views are presented in the literature that describes the theory of a firm; each view will have a different implication for reporting on organisational performance (Hubbard, 2006). The two key theories that impact on this particular research question are that of Milton Friedman's Shareholder theory and that of Edward Freeman stakeholder theory. Friedman (1970) views a company's responsibility to increase profits for owners or shareholders. The concept of Triple-Bottom-Line reporting is based on stakeholder theory, but takes a much wider perspective of the stakeholders affected by the organisation. The theory states that a company's overall success should be measured by both the traditional financial metrics as well as ethical, social and environmental performance (Elkington, 1998). The research question presented aims to further explore the topic of Triple-Bottom-Reporting in order to better understand the impact of the various types of content on a company's share price. Several studies have attempted to understand the use of corporate reports and their respective content to investors. Analysis of the literature indicates that the results of such studies vary widely, are inconclusive and provide no clear answer as to the effectiveness of utilising Triple-Bottom-Reporting as part of a corporation's information dissemination strategy.

Numerous studies have been conducted that indicate that the publication and disclosure of social, ethical and environmental content does indeed have an impact on a company's share price. Examples of such studies include; Moneva and Cuellar (2009) found that there is an association between environmental reporting and financial performance, their research further suggests that environmental information that is not financial in nature is not relevant, however, environmental information that

is financial in nature is relevant. Bertholot et al. (2012) explored whether investors value the publication of separate sustainability reports. The results indicate that investors attach a positive value to the publication of such reports. Wahba (2008) demonstrated that the market rewards firms for their environmental consciousness, as Corporate Environmental Responsibility exerted a positive and significant coefficient on the firm market value.

The literature also presents a number of studies that indicate that the disclosure of such information has no impact on a company's share price. Examples of such studies include; Murray et al. (2005) who indicate that no relationship of any kind was found between the company's shares and its release of environmental and social information and Murray et al. (2005), who indicate there is no association between a company's share price growth and the dissemination of environmental and social information.

The results of the regression analysis are in line with authors such as Moneva and Cuellar (2009) and Bertholot et al. (2012) who conclude that the disclosure of social, ethical and environmental content does impact on a company's share price. Further analysis into the content that the divisional reviews section contains reveals that in addition to a summary of the financial performance of each of the divisions, the sections contains detailed content that relates to sustainability, CSI, environmental issues, responsible product sourcing, commitment to the environment, employee development, community and social support and community projects.

Results of the multiple linear regression indicate that most sections of the online integrated report do not have a significant impact on a company's share price, these results are line with prior research that has been conducted that indicates that there are a wide array of factors that influence share price movement. The study does however indicate that the only significant section that impacts the publishing companies share price is division review views. Results indicate that divisional reviews have a negative impact on a company's share price. A review of the content that was published as part of the divisional reviews section offers 2 possible explanations for this inverse relationship. Of the 5 divisions reviewed, 2 of the 5 divisions showed a decrease in revenue with an overall decrease in revenue across all the divisions. The inverse relationship may be explained by the poor results that were released for the 2 divisions. The overall decrease in revenue would be reflected in the financial section

of the report which reflects no impact in share price. The second explanation which may explain the inverse relationship is that users were not convinced with the social, ethical and environmental content that was published.

Further analysis of the multilinear regression analysis indicates an R-squared value of 0.55 indicating that integrated report views explain just above half of the variation in share price movement. Further to this, the results of the regression analysis output an intercept coefficient of 28.01 (though not statistically significant), showing a picture that unknown factors have a large impact on share price movement compared to the impact that the number of views that the online integrated report receives. The findings of the regression analysis are in line with the opinion expressed by Fisher (1986) as some of the above-mentioned studies that have been presented as part of the literature review.

5.2.2. Implication of Results

The insights generated from the regression analysis will allow; executive management, investor relations departments, academics as well as policy-making entities to better understand the impact that online integrated reporting has on a company's share price and better align integrated reporting to stakeholder requirements.

One of the key insights that were generated by the study is that whilst small, integrated online reporting does have an impact on the publishing companies share price. Sharenet (2018) indicates the market capitalisation of the top 40 companies by market capital are all above R54 Billion rand, a small impact on the share price from the integrated online report will therefore translate into large impact in terms of the overall effect on the total market capitalisation of the company. This insight indicates that the budget that has been set aside for the online integrated report must take into account the potential impact that it will have on the company's share price. The analysis also indicates that social, ethical and environment content is an important factor that needs to be carefully crafted before publishing. The online report must make use of latest available technological tools that will enable users to better engage with the content.

6. CONCLUSION

6.1. Summary

Technology is advancing at a rapid rate, resulting in a decrease in information dissemination costs and an increase in communication mediums available to corporates. The amount of information that is becoming available to investors is growing at a rapid rate, having the ability to understand what type of information is important to investors and how investors consume this information is becoming more important to companies.

The study utilised web log data of multiple companies that are listed on the Johannesburg stock exchange in order to generate insight into the information requirements and behaviour of online integrated users and the impact that online reporting ultimately has on the company's share price. A Correspondence Analysis was utilised as an exploratory tool in order to better understand user information requirements and behaviour across a number of industries in South Africa. A multiple regression analysis analysed the number of views that the various sections of the online report received with respect to share price variations in order to better understand the effect that online integrated reporting has on a company's share price.

The results of the study indicate that in terms of the impact of online reporting on share price, that whilst small, the integrated report does in fact have an impact on the company's share price. More specifically the research showed that the only significant section that had an impact on the share price was divisional reviews and the associated content that relates to social, ethical and environmental issues.

In terms of understanding investor information requirements and behaviour the research was able to generate insights that are different from studies that have previously been conducted. Whilst previous studies have focused on what information is important to investors, particularly with regards to financial vs. non-financial, this study took an approach that revealed that particular pieces of content are related with financial metrics where others are not. The Correlation Analysis revealed that specific content is important to users from specific industries.

6.2. Recommendations

The insights generated from the research enable executive management, investor relations departments, academics as well as policy-making entities to better understand how users engage with online integrated reports and the impact that they have on a company's share price. This understanding allows Integrated Report stakeholders to better understand their audience and develop reports to better suit company stakeholder requirements. The recommendations from the study that are relevant to report stakeholders are as follows:

- The Divisional Reviews section of the online report does in fact have an impact on the publishing companies share price, companies are to therefore allocate the necessary budget and ensure that the project is considered high priority to ensure that shareholder value is not lost.
- The research indicates that social, ethical and environmental elements, which were incorporated into the divisional reviews section, does in fact have an impact on a company's share price. Companies are therefore required to ensure that strategies are in place that address these issues as well as ensure that the reporting of such issues in the Online Integrated Annual Report are of a high standard.
- The study highlights the key pieces of content that should be incorporated into the home page design. The key pieces of content that should be incorporated are; an easily identifiable link to pdf download documents, links and content that address the businesses strategy and links that allow users to easily navigate through content that relates to company remuneration policies.
- The content of the Online Integrated Annual report is to be written and structured in such a way that clusters of information are linked. This linking will ensure the cross referencing of information as well as giving the user the ability to navigate between the relevant sections.
- Policies to be developed that incentivise South African companies to implement XBRL (Xtensible Business Reporting Language) reporting. The research indicated that specific pieces of content are relevant to specific industry sectors. Increased use of XBRL reporting would enable users to easily compare this content across the various companies within sectors.

6.3. Study Short-Comings

Whilst the ability to apply the use of historic web-log data to online integrated reporting as a proxy to better understand investor behaviour and information requirements is able to generate new insight, there are a number of short-comings that relate to both the data as well as the methodologies that have been used in this study.

The short-comings that relate to the data that has been used are as follows:

- The data that has been used captures what information has been accessed online, however it does not indicate whether this information has been used or read by the user.
- Web browsers will typically cache data from previous visits. This process of caching will result in returning visits that are not recorded.
- The collection method does not allow for the segmentation of institutional investors and retail investors.
- It is difficult to associate visits to visitors utilising only web-log data. Each visitor will utilise a specific IP address; however, an individual may utilize a number IP addresses over a specific time period.
- The way in which the report is structured can determine the type of information that users will read. If for example, the financials are placed as secondary categories in the report, the user may have to access other sections in a bid to find the reports

The short-comings that relate to the methodology that has been used are as follows:

- Not all integrated annual reports are structured in the same way which makes it difficult to compare the reports of different companies. The manual classification of website content is required to allow for such a comparison which may skew the results.
- The legislation does not require companies to report on specific areas, no structure is prescribed, which can make it difficult to include some companies into the comparison.
- Content matters, the type of content that is published in the report will impact on share price movement. For example, the fact that financial views is not a

significant factor that predicts share price movement does not necessarily mean that it is not important. The financial results of the reporting company might not have been different to that of the previous reporting period and therefore should not have any logical impact on the company's share price.

Despite these limitations, the literature states that the ability to utilise web-log data offers the ability to measure the use of online Investor Relations activity and information use, and is an improvement compared to the traditional methods that have previously been carried out. As a result, the results of this study are expected to be relevant and essential for the research and debate regarding the informational requirements of investors.

6.4. Future Studies

In order to mitigate some of the above-mentioned short-comings there are a number of improvements that can be applied to future studies. Some of the key considerations that can be applied going forward are as follows:

- The above study made use of generic web-log data that is typically collected for all web page visits. Google, however, allows users build custom-made reports that can be designed to answer specific questions. In order to improve upon this study, specific hypotheses are to be formed prior to the collection of data. The data collection can then be designed in order to ensure that the hypothesis can be answered.
- Whilst the above study tracks all web site traffic, there is no way of understanding who the visitors are. Online integrated reports are utilised by many stakeholders including but not limited to retail investors, institutional investors, company employees and potential investors. In order to better understand the behavior and information requirements of these stakeholder groups, a sample set of users can be asked to sign in to the report prior to consuming its content.
- In order to better understand the informational requirements of users, an analysis of both search engine searches as well as internal report searches can be carried out. Utilising this methodology would highlight the type of information that is important to investors.

- In order to better understand user behavior it is recommended that studies are carried out that focus on mapping out user journeys. These studies would allow researchers to gain a deeper understanding of user behavior.

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