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**DECISION USEFULNESS OF FINANCIAL REPORTING INFORMATION OF
SOUTH AFRICAN LISTED COMPANIES**

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October, 2017

DECLARATION

I certify that the minor dissertation submitted by me for the degree Master's of Commerce (International Accounting) at the University of Johannesburg is my independent work and has not been submitted by me for a degree at another university.

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ABSTRACT

The decision usefulness of financial reporting information has received growing attention in research over the last five decades. The advent of value relevance research emerged with various approaches which investigate the relationship between elements of financial reporting information and market prices of equity instruments for making equity investment decisions.

The study proves the usefulness of financial reporting information that is prepared according to International Financial Reporting Standards (IFRS) in making investment decisions to obtain investment returns that are superior to average market returns. By applying the Piotroski Model (PM), the information contained in the financial statements of the companies listed under the Industrials Sector's Consumer Goods category on the Johannesburg Stock Exchange (JSE) is found to be useful in making investment decisions.

The results recorded indicated superior returns over five year and eight year periods. The results over the short-term indicated inferior returns, however as these results incurred during the credit crisis of 2007 and 2008 it was not further unpacked and purely treated as a limitation of the study. The study concludes that financial reporting information of the JSE listed companies is useful for equity investors to make buy, hold and sell decisions. Additionally, the PM is regarded as a suitable proxy to test the decision usefulness of financial reporting information.

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LIST OF ACRONYMS/ABBREVIATIONS

ALSI	Johannesburg Stock Exchange's All Share Price Index
CFO	Cashflow generated from operations
CY	Current year
FA	Fundamental Analysis
FASB	Financial Accounting Standards Board
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IIA	Institutional Investor Analysis
IMF	International Monetary Fund
JSE	Johannesburg Stock Exchange
PWC	PricewaterhouseCoopers
PY	Prior year
ROA	Return on assets
TA	Technical Analysis
UK	United Kingdom
US	United States of America

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The purpose of financial reporting has evolved over time in four broad phases, namely from purely providing information to management to providing a basis to shareholders for assessing the stewardship of the management over an entity's resources. This was followed by a focus on the decision usefulness of financial statements, initially looking at the needs of a wide range of stakeholders but presently, focussing on decision usefulness for primary users (Swartz, 1995; Bruinette, 1998; Gaffikin, 2008; International Accounting Standards Board (IASB), 2015). Primary users are defined as "existing and potential investors and credit providers" (IASB, 2015). Decision useful information is information that can influence the outcome of decisions made by capital providers with respect to buying, holding or selling capital instruments (Hellstrom, 2005; IASB, 2015).

In order to evaluate the decision usefulness of financial reporting information, this study applies the PM as a proxy to prove that the objective of financial reporting relating to JSE listed companies with respect to existing and potential investors is achievable, namely that the information contained in financial statements is useful in making investment decisions. The PM has been successfully applied in other jurisdictions as a tool to test decision usefulness of financial reporting information (Piotroski, 2000; Mohanram, 2005; Clubb & Naffi, 2007; Galdi & Lopes, 2013). In addition, the model is easy to apply and enhances the investor's understanding of financial reporting information by presenting financial reporting information in a concise manner to enable the investor to make investment decisions (IASB, 2015).

The narrowed target audience envisaged in the current objective of financial statements enables the study to focus on equity investors as their main need to preserve and/or grow capital invested can be easily traced to the movements in share prices. The study contributes to the body of research termed value relevance that evaluates the degree to which financial reporting information can be used to predict the market prices or movement

in market prices of equity instruments that can be tested by empirical evidence (Easton, 1999; Barth et al., 2001; Hellstrom, 2005; Beisland, 2009 & Keener, 2011).

The aim of this chapter is to provide context with respect to the research. The following sections will establish this context by evaluating the research problem, defining the objectives and motivation for the study and explaining the methodology and the population covered in the study. In addition, the chapter identifies the limitations of the study and layout for the rest of the chapters in the study.

1.2 RESEARCH PROBLEM

The Conceptual Framework for Financial Reporting (2015) focuses on enabling users of financial statements to make decisions to buy, hold or sell capital instruments. It is therefore assumed that financial statements prepared and presented according to IFRS are decision useful. Strong companies are those that demonstrate high expected returns while minimising the levels of risk to the investor based on internal measures derived from historical financial reports (Swartz, 1995; Bruinette, 1998). The PM has been proven in other research studies to enable investors to identify strong companies to be applied in portfolio construction to yield superior returns and minimise risk for the investors. If this study succeeds in showing that the application of the PM by obtaining information from financial statements prepared and presented according to IFRS, was successful in identifying strong companies, one can also assume that the financial statements proved to be decision useful in coming to the right selection. The study aims to prove, by applying the recognised PM, that the information contained in financial statements of the companies listed on the JSE is useful for investment decision making. This will be achieved by analysing the relationship between the identified strong companies and the returns earned by investors over a period of eight years of portfolio construction. That is, if returns from portfolios made up of these strong companies prove to be superior to the average market, one may assume that the information in the financial statements proved useful in this decision process. In making decisions to buy, hold or sell equity instruments, equity investors often must make comparisons across different potential investments in order to select strong companies to invest in. The identification of strong companies

should enable investors to maximise future returns while minimising the risk of losing part or all the capital invested (Piotroski, 2000; Mohanram, 2005). Consequently, individual investors require a mechanism to assist them in interpreting financial reporting information in order to determine whether or not a company is a good investment. The mechanism should also have the ability to enable comparison between different investments in order to construct a portfolio comprising of strong companies (Piotroski, 2000; Mohanram, 2005). The study is not aimed at institutional investors nor does it explore the active versus passive investment strategy.

1.3 OBJECTIVES OF THE STUDY

The study covers two objectives, namely: 1) contributing to the decision useful literature by extending findings of previous research to the South African context; and 2) evaluating whether the PM could be applied as a suitable proxy to test the decision usefulness and improve the understanding of financial reporting information for JSE listed companies when making equity investment decisions.

The research seeks to prove that the financial reporting information of companies listed on the JSE is useful to assist potential investors to select equity instruments that will maximise investment returns while minimising the risk of losing part or all the capital invested as part of an investment portfolio. The study does not purport to justify that financial statement information based on IFRS is the only source of information for investment decision making, but that it does provide useful information for equity investment decision making (IASB, 2015). In addition, the study does not aim to prove that the PM provides the best investment strategy.

Since the PM was successfully tested in other parts of the world namely the United States (US), United Kingdom (UK) and Asia (Clubb & Naffi, 2007), this study assumes that the model is a useful tool in identifying strong companies for portfolio selection. Investors could apply the PM for determining strong companies in which to invest and then apply other means to assess external considerations affecting company performance. The PM is aligned with the Fundamental Analysis (FA) approach to investment decision making

which is concerned about identifying the right companies in which to invest based on historic financial reporting information to derive a company's fundamentals. As the study is centred on the decision usefulness of financial reporting information, Technical Analysis (TA) and Institutional Investor Analysis (IIA) approaches, which do not primarily take input from financial reporting into account, but focus on the movement of share prices on the stock exchange and institutional investor behaviour respectively, are excluded (Bruinette, 1998; Lee et al., 2011).

1.4 MOTIVATION FOR THE STUDY

Publicly available financial reporting information is the main source of information available to the average individual investor to make investment decisions. It is important to prove that such information is useful to make those investment decisions and additionally, a mechanism to simplify the assessment of financial reports to identify strong companies will be hugely beneficial to individual investors. Furthermore, decision usefulness is the objective of financial reporting and therefore a study that tests the decision usefulness of financial reporting information of JSE listed companies may be of interest to regulators and bodies charged with ensuring adherence to international standards as it links theory to practice. Financial reporting, which is decision useful and contributes to the economy as Beisland (2009) asserts that decision useful financial reporting information leads to lower risk for equity investors reducing the cost of capital and increasing levels of investment which has an impact at a macro-economic level.

Studies such as Ou and Penman (1989); Ohlson (1995); Piotroski (2000) and Mohanram (2005) identified various models that were used in studies undertaken internationally in the US, UK and Asia to select strong companies in portfolio construction. Galdi and Lopes (2013) applied both the Piotroski (2000) and Mohanram (2005) models to portfolio construction and proved that applying these models to the financial statements of small to medium sized firms on the Brazil Stock Exchange yielded returns that were superior to average market returns. These two models utilised financial indicators comprising nine and eight signals respectively. The findings were that companies that were identified as

strong produced returns that were above the average market returns in the succeeding one and two periods post the analysis.

The PM was selected as the tool for this study for several reasons; 1) it provides a mechanism to perform financial statement analysis to identify strong companies; 2) it is easy to apply; 3) the model enhances the understandability of financial information; and 4) the model has already been proven as a useful tool in prior research. Swartz (1995), quoting International Valuation Standards (2005), argues that financial statement analysis should incorporate an evaluation of monetary values, percentages and various ratios to understand the financial returns as well as the level of risk in the business. In considering risk, Mc Clure (2011) states that while the big corporate failures like Enron and WorldCom came as a surprise to many people, financial reports may have contained information pointing to the impending fall. An appropriate model like the PM applied periodically to the entities in the portfolio could have triggered an exit strategy from the equity investment or rather excluded the particular company as an investment option (Mc Clure, 2011).

The PM groups nine signals into three categories, namely capital structure, performance and operating efficiency (Piotroski, 2000). Unlike other models that can be found in literature, the PM is simple to apply and does not rely on complex statistical methods to calculate signals. The model standardises the outcomes of the calculations of each company by providing a composite measure that is on a scale from 0 to 9, which enables the investor to compare one company with another based on a measure of strength - the higher the score, the stronger the company.

Accounting research assumes a level of understanding of accounting concepts for one to be able to read and understand financial statements (Deegan, 2010). In addition, the qualitative characteristic of understandability in the Conceptual Framework assumes that readers of financial statements have a reasonable understanding of business and economic activities and are expected to apply diligence in interpreting financial statement information (IASB, 2015). The PM was selected as it is easy to apply and improves understanding of financial statements (Piotroski, 2000). The ability of the PM to address the information needs of equity investors is further explored in Chapter 2.

In this study, the emphasis is not on the specific model chosen, but rather to prove the decision usefulness of financial information and therefore this study assumes that the PM is adequate as proven by past research.

1.5 METHODOLOGY AND POPULATION

The study follows the positivist approach and tests whether the PM can be used as a suitable proxy to test the decision usefulness of financial reporting information for JSE listed companies. The study focuses on the use of the PM in constructing equity investment portfolios. The methodology is further explained in Chapter 3.

The study focused on companies that are listed on the JSE under the Industrials Sector's Consumer Goods category. A suitable sample was selected (further explained in Chapter 3) and the financial reporting information was obtained from the I-Net BFA database. The specific sector was selected as a representative of the activity on the JSE due to the diverse nature of companies under the Industrials Sector. The 2006 financial reporting period was used as the base year for the purposes of calculating the PM nine signals for the companies in the sample. This is because the study takes the position that equity investment decisions are made for the medium to long term and to cover a complete investment cycle, which is believed to span over a period of a year to ten or twelve years (Stock & Watson, 1998; Kaminsky & Schmukler, 2008). The results of the calculation were used to determine the strength of the companies in the sample. The market returns of each of the companies selected were tracked over periods of two, five and eight years. For contrast, the growth was compared to the movement in the total sector (Industrials Sector's Consumer Goods category) and the All Share Price Index (ALSI) over those periods. The results were then collated and reported on.

1.6 LIMITATIONS OF THE STUDY

As earlier cited, literature strongly supports the fact that financial reporting information can be used as predictors of equity returns (Piotroski, 2000; Mohanram, 2005; Wahlen & Wieland, 2011). It is however important to note that there are some limitations that have

been identified in literature. Swartz (1995), quoting Flegm (1989), notes two limitations of accounting information as backward looking and ignoring intangible assets. This finding is aligned to the studies by Amir and Lev (1996) and Dontoh et al. (2004) who found that financial reporting information had no value relevance for companies in the service and high-technology sectors.

This study, by using the PM, ignores external factors that may impact companies' performance in the future. Political, economic, monetary and industry considerations are not factored into the analysis, which also impact investment outcomes (Bruinette, 1998; Sloan, 2001). The market efficiency theory concludes that market prices incorporate all publicly available information (Hellstrom, 2005), however, contrary to the market efficiency theory, Piotroski (2000) and Mohanram (2005) argue that information in financial statements is not adequately reflected in the market price and information is not always read correctly nor adequately considered. The field of behavioural finance argues that economic decisions are not always rational (Galdi & Lopes, 2013). Swartz (1995) and Gaffikin (2008) believe market sentiments impact the performance of certain equity instruments. In addition, there are qualitative factors that impact the strength of companies by impacting the companies' riskiness including a change in auditors; the going concern clause in the financials, top management defections, big insider or institutional sales of the equity instruments, big perk cuts and investigations by the Securities and Exchange Commission amongst others (McClure, 2010).

As the study is centred on the decision usefulness of financial reporting information, TA and IIA approaches, which do not primarily take input from financial reporting into account, but focus on the movement of share prices on the stock exchange and institutional investor behaviour respectively, are excluded (Bruinette, 1998; Lee et al., 2011). The study is not aimed at institutional investors nor does it explore the active versus passive investment strategy. These factors are not incorporated into the suggested model as it is unlikely that this information will be available to individual investors.

In addition to the factors above relating to limitations of financial reporting information and the PM, limitations relating to the study include that the focus on the specific industry

segment in the sample selection may be considered as narrow and the fall in the market of 2007/2008 may be a limitation to the study. The study focuses on a specific industry to eliminate differences brought about by different sectors. The global financial crisis of 2007–2008 severely affected share prices on the JSE and as a result no meaningful conclusions could be made (refer to Chapter 4).

1.7 ETHICS

Financial reporting information applied in the study is available in the public domain eliminating concerns around privacy of companies under study. Further, in presenting the results, the companies in the study have not been identified. The study also does not offer advice on which equity instruments to buy or sell. Based on the above, there is sufficient evidence to prove that no ethical issues can be envisaged in the study.

1.8 CHAPTER LAYOUT

Chapter 1 – Introduction

The aim of this chapter is to provide context with respect to the research. The chapter summarises how the study proves the decision usefulness of financial reporting information of JSE listed companies by following a systematic approach. The chapter achieves this by evaluating the research problem, defining the objectives and motivation for the study and explaining the methodology and the population covered in the study. In addition, the chapter identifies the limitations of the study, ethical implications and the layout for the rest of the chapters in the study.

Chapter 2 – Literature Review

The literature review evaluates evidence that is available to establish the evolution of the objective of financial reporting as defined by the IASB (2015). The decision usefulness of financial reporting specifically to investors is investigated in terms of current literature. Based on current literature, the PM is identified as the designated model to be used

through an analysis of a sample of JSE listed companies in order to test the decision usefulness of financial reporting information in making equity investment decisions.

Chapter 3 – Research Design

Chapter 3 explains how the research was approached. The research has been designed to determine the decision usefulness of selected JSE listed companies' financial reporting information by applying the PM to determine the strength of companies. Consequently, the chapter explains the PM signals with respect to the definition of each signal. This is followed by a discussion of what constitutes a positive or unfavourable signal result and corresponding allocation of a binary number 0 or 1 that will be consolidated into the summary measure per company, the composite score. The soundness of the research design to meet the research objectives is explained by exploring the philosophy, approach and the sample and data considerations to meet the research objectives.

Chapter 4 – Results

This chapter summarises the results from the study. The results presented prove that by applying the recognised PM that the information contained in the financial statements of the companies listed under the Industrials Sector's Consumer Goods category on the JSE is useful. Signals derived from financial reporting information indicated that there is a relationship between the company strength based on the composite score and the market returns of the companies in the sample. The average market returns of the total sample were compared to the returns in a portfolio that comprise strong companies (high composite scores) and a portfolio that excludes weak companies (low composite scores are eliminated). The results recorded indicated superior returns over five year and eight year periods. The results over the short-term indicated inferior returns, however as these results incurred during the credit crisis of 2007 and 2008 it was not further unpacked and purely treated as a limitation of the study. The view is taken that it would be inappropriate to form conclusions from these results. The chapter concludes that financial reporting information of the JSE listed companies is useful for equity investors to make buy, hold and sell decisions. Additionally, the PM is regarded as a suitable proxy to test the decision

usefulness of financial reporting information. The results indicated that the objectives of the study were met.

Chapter 5 – Conclusion

The conclusion summarises the research journey and demonstrates how the objectives of the research were met. This provides context to the study, findings, the interpretation of the results and potential future areas of study.



CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

International Accounting Standard 1 (IAS1) requires a complete set of financial statements to comprise of a statement of financial position, a statement of profit or loss and other comprehensive income, a statement of changes in equity and a statement of cash flows and accompanying notes. The objective of financial reporting is to supply information that is useful for decision making by equity investors and credit providers (IASB 2015). Because of its importance, the decision usefulness of financial statements in meeting the needs of equity investors has attracted several researchers' attention. Although the IASB (2015) identify both equity investors and credit providers as primary users of financial reporting information, Barth et al. (2001) recognise equity investors as the main focus of financial statements. In their respective studies, Ball and Brown (1968), Ou and Penman (1989) and Amedu (2012) claim that financial statements contain information that enables investors to predict future company returns and make informed investing decisions. Chai et al. (2012) reached a similar conclusion and their study places a higher importance on accounting information contained in the statement of profit and loss and statement of financial position than the rest of the reports included in financial reporting.

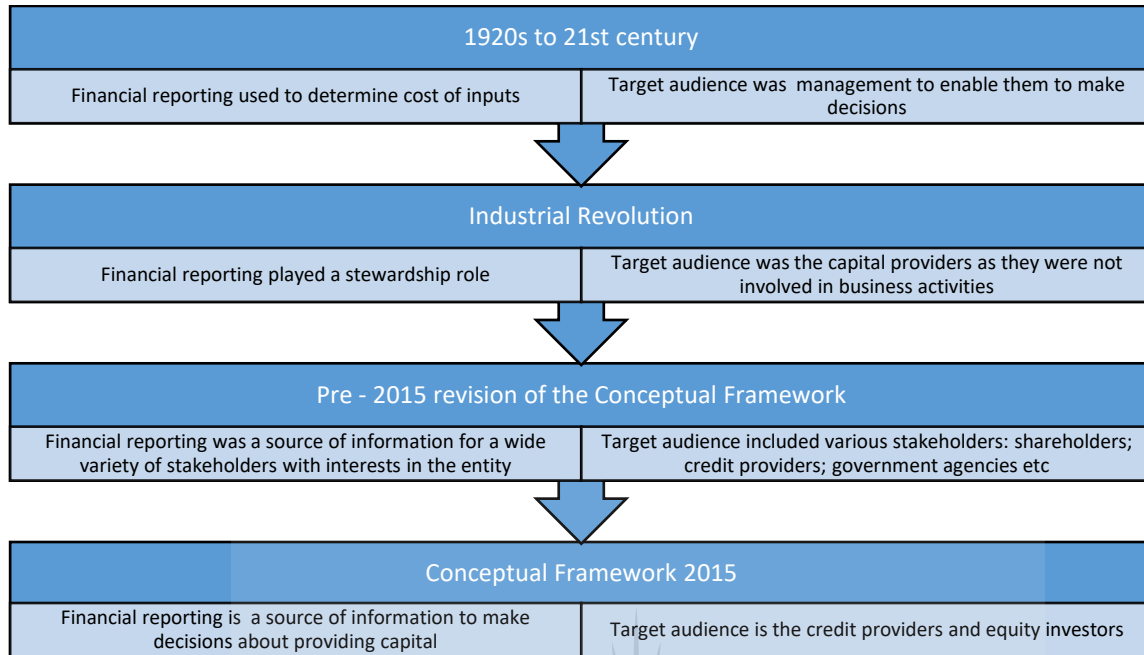
The purpose of this chapter is to define financial reporting and analyse the evolution of the objective of financial reporting as per the Conceptual Framework for Financial Reporting (IASB, 2015). This will link to a discussion on decision useful financial reporting information as it relates to equity investors. This will allow for the identification of specific information requirements that the researcher should consider to include in the study. In addition, literature is used to build a case for the PM, which has been identified as a suitable proxy to test the research objectives.

2.2 CONCEPTUAL FRAMEWORK CURRENT OBJECTIVE AND THE HISTORY OF THE OBJECTIVE OF FINANCIAL REPORTING

Although the need to reflect the economic substance of business activities has been central to accounting activities over time, the objective of financial reporting has evolved over the years as recorded in literature (Swartz, 1995; Gaffikin, 2008). The recent revision to the Conceptual Framework has seen the Financial Accounting Standards Board (FASB) and the IASB boldly singling out investors and credit providers as the primary users of financial reporting information (Bullen & Crook, 2010; IASB, 2015). The Conceptual Framework for Financial Reporting (2015) defines the objective of financial reporting as providing useful information to primary users to enable them to make decisions about providing resources to the entity (IASB, 2015). The decisions include buying, selling or holding debt or equity instruments of the organisation (IASB, 2015). The objective, as stated by the IASB (2015), is aligned to the FASB, the American counterpart of the IASB. The connection is as result of the convergence project undertaken in 2002 by the two boards to come up with a combined Conceptual Framework (Bullen & Crook, 2010; Deegan, 2010). The project has been partially completed and the IASB undertook an IASB only comprehensive project which the IASB expects to complete by the end of 2017 (IFRS Foundation, 2017).

The following section will investigate the evolution of the objective of financial reporting as recorded in literature. Figure 1 demonstrates a contrast between the objective of financial reporting and identifies the target audiences at each phase of evolution.

Figure 1: History of the evolution of the objective of financial reporting



Source: Author's own work

Gaffikin (2008) describes the evolution of the objective of Financial Reporting from the 1920s through to the 21st century as set out in figure 1 above. He documents how this objective started out from a need to record the results of economic activity undertaken by the business to make internal decisions with respect to the costs of inputs into the business process. The major shift occurred during the Industrial Revolution when financial reports were required to reflect management's stewardship over the resources of the business entrusted to them due to the divorce of ownership (capital providers) and control (management). Financial Statements then evolved to reflect the needs of various stakeholders who would rely on financial statements for decision making:

“Financial accounting is a process involving the collection and processing of financial information to assist in making various decisions by many parties internal and external to the organisation. These parties are diverse and include present and potential investors, lenders, suppliers, employees, customers, governments, the local community, parties performing a review or oversight function, and the media.”
(Deegan, 2010:34).

Accounting literature is clear that financial reporting has at its core, the need to provide information to enable users to make economic decisions (Gaffikin, 2008; Deegan, 2010). The narrowed objective as defined by the IASB (2015) recognises that providing useful information to a wide variety of users may be problematic as some of the information needs of the various users may be conflicting and therefore focuses the objective of financial statements on primary users. The IASB (2015) however, indicates that while financial statements are targeted at primary users of financial statements, the needs of a wide range of stakeholders would also be satisfied (IASB, 2015). The section below explains the attributes of decision useful information as defined by the IASB.

2.3 ATTRIBUTES OF DECISION USEFUL FINANCIAL REPORTING INFORMATION

In narrowing the objective of financial reporting to capital providers, the IASB (2015) determined that equity investors and credit providers need to be able to determine expected returns and the risk associated with those returns. Returns are in the form of dividends, interest and the corresponding growth in capital as represented by prevailing market prices in comparison to the price paid when funds were made available to the entity (Fama & French, 1992; Ohlson, 1995). Risk relates to the probability that the capital provided may be eroded or the entity may not provide the expected returns and this can be explained by information contained in financial statements (Ou & Penman, 1989; Fama & French, 1992). Financial reporting would then need to present and disclose sufficient information about the cash flows of the entity as well as management's stewardship over the affairs of the entity as evidenced in financial reports (Lennard, 2007). In addition, capital providers should be in a position to assess the amount, timing and uncertainty relating to those future cash inflows and outflows (Charitou, 1997). Financial reports contain information about the entity's resources and claims to those resources, as well as transactions that occurred during the reporting period, and their effect on resources and claims to the resources (IASB, 2015). This study focuses on information that is presented in the statement of financial position, the statement of profit or loss, the statement of other comprehensive income, the statement of changes in equity and the statement of cash flows. The study did not use information in the notes to the financial statements as this

was not required by the PM. The Discussion Paper to the Conceptual Framework for Financial Reporting (2015) makes a distinction between primary financial statements and notes to the financial statements. Primary financial statements include the statement of financial position, the statement of profit or loss, the statement of other comprehensive income, the statement of changes in equity and the statement of cash flows (IASB, 2015). The discussion paper explains that the objective of these primary financial statements is to provide useful information to users of financial statements in making decisions about providing capital to the entity (IASB, 2015).

The IASB (2015) identified the types of information that are likely to be most useful to the existing and potential investors, credit providers and other creditors for making decisions about the reporting entity. The qualitative characteristics required to achieve this goal distinguish between fundamental characteristics (relevance and faithful presentation) and enhancing qualitative characteristics (comparability, verifiability, timeliness and understandability). Although the requirements of all the qualitative characteristics are satisfied, this study mainly focuses on the relevance of financial reporting information. Relevant information alters the decision made if disclosed or withheld and enables users to predict future outcomes and/or confirm previous evaluations (Hellstrom, 2005; IASB, 2015). Accounting research that evaluates the decision usefulness of financial reporting information is referred to as value relevance research and is concerned with the extent to which certain financial reporting information relates to the market prices of equity (Gaffikin, 2008; Swartz, 1995). With respect to equities, value relevance is a concept that evaluates the degree to which financial reporting information can be used to predict the market prices or movement in market prices of equity instruments, which can be tested by empirical evidence (Ball & Brown, 1968; Lev, 1989; Easton, 1999; Barth et al., 2001; Hellstrom, 2005; Keener, 2011). This is regarded as so important that a body of research has emerged in the last five decades termed value relevance research, which is concerned with the relationship between financial reporting information and market prices of equity instruments (Lev, 1989; Barth et al., 2001; Beisland, 2009). Value relevance is important in the discussion of decision usefulness of financial reporting information as the returns expected by investors are largely related to the movement in the share prices of equity instruments.

Literature identifies two types of decision useful approaches to relevant financial reporting information (Harris et al., 1994; Hellstrom, 2005). One approach utilises financial reporting information to derive a value (fundamental value) that represents the worth of the equity instrument and the other approach determines a score that represents the strength of that instrument (Piotroski, 2000; Mohanram, 2005; Wahlen & Wieland, 2011). In the first instance, different types of valuation methods are identified that make use of financial reporting information to estimate the value of an equity instrument in differing proportions (Ohlson, 1995; Swartz, 1995; Bruinette, 1998;). These methods are also referred to as Fundamental Valuation Techniques and include discounted present value of expected future returns, asset based methods and sales methods that make use of a comparison of variables such as adjusted price-earnings ratios (Swartz, 1995). Fundamental Valuation Techniques that focus on asset based methods have attracted much debate as researchers attempt to explain the gap between book values of equity and market prices (Keener, 2011). The second approach that relies on the relevance of financial information is where financial information is utilised to determine the direction of changes in equity instrument variables such as prices and/or earnings (Ball & Brown, 1968; Ou & Penman, 1989; Piotroski, 2000; Mohanram, 2005; Clubb & Naffi, 2007). This approach makes use of FA; however, the goal is not to determine the value of a business but to determine the strength of a business that will assist investors in making buy, hold or sell decisions with respect to equity instruments. The section below explores how financial reporting information is applied by investors in making equity investment decisions.

2.3.1 Decision usefulness of financial reporting applied in equity investment decision making approaches

Investors typically follow one or more of three processes of equity investment analysis in selecting individual equity investments namely, 1) FA; 2) TA; and 3) IIA. FA is an approach that makes use of key variables from financial statements that impact equity returns (Lee et al., 2011). TA is concerned with historical trends in share price and volume movements that may be used to predict the direction of future equity returns (Bruinette, 1998; Lee et

al., 2011). IIA, as the name suggests, is an approach that analyses the activity of institutional investors with respect to decisions to buy and sell equities as triggers of the direction of equity returns (Lee et al., 2011). IIA works on the premise that institutional investors have access to more information and expertise than the average investor and therefore studies have proved such approaches useful in equity investment decision making (Lee et al., 2011). This study particularly focuses on the decision usefulness of financial reporting information and therefore excludes TA and IIA since these approaches do not make use of financial reporting as a primary base for making equity investment decisions. The study will therefore focus on the FA approach as discussed below.

The first step in FA is to extract key financial reporting information that is known to have an impact on the future risks and returns of the equity instrument, referred to as value relevant information (Ball & Brown, 1968; Swartz, 1995; Sloan, 1996; Bruinette, 1998; Piotroski, 2000; Mohanram, 2005). Abarbanell and Bushee (1997) positively prove the value relevance of key financial reporting information in predicting future earnings that is not always fully exploited by analysts' predictions. The financial reporting information is utilised to derive a value (fundamental value) that represents the worth of the instrument or a score that represents the strength of that instrument (Piotroski, 2000; Mohanram, 2005; Wahlen & Wieland, 2011). Galdi and Lopes (2013) performed such a study in the Brazilian context based on evidence from literature supporting the fact that financial statement information could be used to derive the fundamental values of companies that could be applied in portfolio construction to design portfolios yielding above average market returns. In a study by Ou and Penman (1989), they prove that abnormal returns could be gained by portfolio construction that is based on a summary measure derived from financial statement information. Lev and Thiagarajan (1993) prove that company fundamentals, which are based on financial statement information, have value-relevant content and also contain information that could be used to determine the strength of companies in portfolio construction. They further prove that in scenarios where the fundamentals appear weak or are not correlated, the results are impacted by the macro-economic conditions prevailing at the time and not the financial reporting information used to make decisions. Sloan (1996) performed a study on the value relevance of information contained in the accruals and cash flows of companies and found that market prices fail

to reflect this information. Therefore, investors could take advantage of the insights contained in financial reporting information to create portfolios that yield superior returns.

The next step in FA is that researchers then compared the fundamentals with prevailing market prices to determine if the equity instrument is priced fairly before making investment decisions (Fama & French, 1992; Lakonishok et al., 1994; Piotroski, 2000; Mohanram, 2005). Where the equity instruments are undervalued, these are referred to as value equity instruments (Noma, 2010). On the other hand, overvalued equity instruments are referred to as glamour equity instruments (Lakonishok et al., 1994). Many studies have documented extensively the impact that value or growth equity instruments have on the ability to generate future returns in investment portfolios (Fama & French, 1992; Lakonishok et al., 1994; Piotroski, 2000; Mohanram, 2005). It is generally held that a portfolio construction strategy that longs value equity instruments and shorts glamour equity instruments will result in abnormal returns (Fama & French, 1992; Piotroski, 2000; Mohanram, 2005). In portfolio construction, when an instrument is long, it means that a decision to buy a particular instrument is made in expectation of a price increase to be held as part of a portfolio. On the other hand, a short position in a particular instrument means that the view is that the price of the instrument will reduce and therefore there is an opportunity to make a profit by pre-selling the equity instrument at the higher price (the result is that when the equity instrument price eventually reduces, the equity instrument is bought at a lower price to fulfil the short position in the portfolio (Fama & French, 1992; Piotroski, 2000; Mohanram, 2005). Piotroski (2000) explains that the success of FA in value equity instruments is driven by the fact that these firms are not followed by many market participants and therefore opportunities for mispricing would exist, creating an opportunity to buy shares at an advantageous price. Mohanram (2005) also applied FA to glamour firms and proved that returns could be maximised using such an approach.

The discussion above supports the fact that financial reporting information is useful to individual investors to make investment decisions. This study adopts the FA approach to equity investment decision making and elects to apply an instrument or tool to determine a score of the strength of equities based on information in financial reports. The section

below links the requirements for decision useful information detailed in the Conceptual Framework for Financial Reporting (2015) and related literature to the PM.

2.3.2 Link between decision usefulness literature and the Piotroski Nine Signal Model

Literature identifies various elements of information requirements for equity investors to enable them to make informed decisions. This section discusses the PM's application of the elements that have been identified in the discussion above as important to decision usefulness namely; 1) the objective of financial reporting; 2) ability to determine future cash flows and the related risk to obtain those cash flows and management's stewardship; and 3) qualitative characteristics of decision useful financial reporting information.

2.3.3 Link to the objective of financial reporting

The PM processes IFRS based financial reporting information into nine signals that are grouped into three categories used to determine the strength of individual equity instruments for the purpose of making investment decisions. The three categories are 1) Capital Structure; 2) Performance; and 3) Operating efficiency. The model's main objective is to provide useful information to make portfolio construction decisions. The model can be applied to indicate a buy, hold or sell decision on a particular equity instrument. This model therefore fully complements the objective of financial reporting.

2.3.4 Link to future cash flows (returns), risk and management's stewardship

Decision useful information must provide evidence to assist users to determine the future cash flows of the equity investment under analysis as well as the related risk to obtain those future cash flows. The PM uses nine signals that have been proven in literature to

contain the most decision content that impact future cash flows of the entity (Ball & Brown, 1968; Lev, 1989; Easton, 1999; Piotroski, 2000; Barth et al., 2001; Hellstrom, 2005; Keener, 2011). In the three signals that assess capital structure for example, the PM assesses the liquidity (ability to cover the short-term claims against the business), leverage (the extent to which the resources of the business have been financed using debt) and equity offer (the movement in the equity due to contributions by equity participants) that occurred in the entity in comparison to the prior reporting period. Analysing the capital structure provides information relating to both risk and returns in the form of future cash flows. A more aggressive trend in the liquidity ratio and leverage points to the additional risk the entity may be undertaking to generate returns. In addition, analysing the trend of capital contributions by equity holders points to the entity's ability to generate funds internally. This signals both the risk in the entity and its ability to generate future cash flows.

Information about the resources and claims can help users to identify the strengths and weaknesses and help users to assess management's stewardship in discharging their duties in managing the entity's resources (IASB, 2015). Changes in economic resources and claims should enable users to identify the cause of those movements and distinguish between changes due to financial performance and changes due to resources being extended to the business (IASB, 2015). There are four signals representing the performance category scoring positively if there was a positive return on assets, positive cash flow from operations expressed in terms of assets held at the beginning of the year, an improvement in the current year's return on assets compared to the previous year and if cash generated from operations exceeds the income for the year (Piotroski, 2000; Mohanram, 2005). Performance signals evaluate the financial performance as well as indicating the entity's ability to generate future cash flows (IASB, 2015). All four performance signals measure the return that the entity is able to produce utilising the resources available to the entity at the beginning of the year. The IASB (2015) links performance as an indication of management's stewardship in managing the entity's resources. The IASB (2015) further states that the ability to determine past performance and assess management's stewardship is useful in predicting future cash flows of the entity.

The two signals assessing operating efficiency measure and award positive scores if the margins over the preceding two years are improving, and the entity is increasingly able to increase the revenue as expressed in terms of the assets of the entity. Shrinking margins could be an indication of management's stewardship (Piotroski, 2000; Mohanram, 2005) or the impact of prices and external market forces on the business model (IASB, 2015). Similarly, the ability to improve revenue in relation to the assets indicates how management discharges its duties (Piotroski, 2000; Mohanram, 2005).

The section below links the PM to the qualitative characteristics as defined by the IASB (2015).

2.3.5 Link to qualitative characteristics

Relevance - Financial reporting information is relevant if it can make a difference in the decision made by users. As mentioned above, the nine PM signals were thoroughly researched as containing and extracting financial reporting information with the most decision content in as much as impacting future returns (Ball & Brown, 1968; Lev, 1989; Easton, 1999; Piotroski, 2000; Barth et al., 2001; Hellstrom, 2005; Keener, 2011). The IASB (2015) further states that relevant financial reporting information has predictive or confirmatory value or both. The PM is applied to predict the direction of future returns by determining strong companies (Piotroski, 2000; Mohanram, 2005). This aligns with the idea that relevant financial reporting information has predictive value (IASB, 2015). The information of equities previously identified as strong can be traced to future periods and assessed based on the growth in returns to confirm if the previous assessment was indeed useful. In this way, the PM analysis will prove to have confirmatory value.

Faithful presentation – This study applies the model to JSE listed companies that are regulated under the listing rules of the JSE as well the Companies Act. Both the Companies Act and the JSE listing rules enforce the requirement that financial statements be audited by independent external auditors. A review by external audit asserts that the

financial statements are faithfully presented in material respects to reflect the activities of the entity.

Comparability – The fact that the nine signals are assigned a score depending on the outcome of each calculation that are aggregated to determine the composite score, enables the users to be able to compare one entity to another in making equity investment decisions. The model therefore enables users to compare different investments with respect to the strength. The scores per category and the composite scores allow users to compare different entities with respect to the strength of the capital structure, performance and operating efficiency. This then assists in making choices of whether to buy or sell one equity instrument against another (IASB, 2015).

Verifiability – This characteristic refers to the fact that IFRS based financial statements are independently audited, resulting in similar outcomes if different individuals prepared the financials from the same information. In addition, if independent individuals apply the PM to the same set of financial statements, the two are likely to come up with materially similar conclusions. The outputs of the model are therefore verifiable.

Understandability – The IASB (2015) states that classifying, characterising and presenting information clearly and concisely makes it understandable. The nine signals in the PM are classified into three categories of financial reporting information and each of the nine signals in the model are allocated a value depending on the outcome of analysis for each signal. This process classifies, characterises and presents financial reporting information in a clear and concise manner for determining strength.

Timeliness - The IASB (2015) states that older information is less useful to users and therefore information needs to be available in time to influence those decisions. The model uses the most recent financial statements to make decisions and therefore also supports this principle.

The discussion below therefore extends the discussion from Chapter 1 on the choice of the instrument to apply as a tool in the study.

2.4 MOTIVATION FOR THE PIOTROSKI MODEL

The purpose of the literature review is to establish whether the modelling of financial reporting information using the PM will support the objective of financial reporting as set out by the IASB (2015) and not to evaluate the model itself. However, the model must impute inputs, being information from the financial statements that can be used to determine the expected future cash flows as well as assessing management's stewardship over the affairs of the entity. The result of the imputation will then provide insights that enable potential and existing equity investors to make buy, sell or hold decisions.

Apart from the fact that the PM was applied successfully in previous research, the model stands out as robust and simple to apply (Piotroski, 2000; Mohanram, 2005; Galdi & Lopes, 2013). The model applies information requirements defined by the IASB (2015) for decision usefulness with respect to equity investors. This information was discussed in Section 2.3. The model enhances the ability to understand and compare financial reporting information relating to different companies (IASB, 2015). The link between the model and financial reporting information will be explored in Chapter 3.

The literature review identified several such models that predict the fundamentals using a composite measure that could be used to determine the direction of future earnings (Piotroski, 2000; Mohanram, 2005; Noma, 2010; Galdi and Lopes (2013)). The PM's nine signals (explained further in chapter 3) are derived from information available on the face of financial statements. The signals are presented in three categories, namely, 1) capital structure, 2) performance, and 3) operating efficiency. The sum of the results of each signal make up the composite score which is used to determine company strength. Ou and Penman (1989) make use of a Pr measure which estimates the probability of an increase in expected future earnings. The Pr measure combines variables from financial statements into one single measure based on a complex mathematical calculation. Fama and French (1992) conclude that a company's size measured by market capitalisation is negatively correlated to expected future returns while the ratio of book value to

market(BM) is positively correlated to future returns. The BM effect explained by Fama and French (1992) was incorporated into models by Piotroski (2000), Mohanram (2005), Noma (2010) and Galdi and Lopes (2013). Mohanram (2005) accepts the success of the PM and extends his study to low BM companies. Mohanram (2005) formulates a model that encompasses eight signals organised into three categories. Two categories are aligned to the performance and operating efficiency categories in the PM. However, Mohanram (2005) omits the capital structure category of the PM and incorporates three signals into a third category. The three signals have respect to accounting conservatism that results in current expenditure relating to research and development, capital expenditure and advertising that reduce assets without corresponding intangible assets being recognised although these expenditures result in higher future earnings. In addition to the category difference, Mohanram (2005) compares the signals to an industry average in order to determine whether the result of each signal is good or bad and then assigns a binary number 1(good) or 0(bad). The sum of the signal results makes up the G score which is comparable to the composite score as per the PM. Noma (2010) formulates a model comprising of the four signals in the PM's performance category to work out a composite score termed F_score and Galdi and Lopes (2013) uses both the PM and the Mohanram (2005) model.

As discussed above, the use of complex statistical methods as in Ou and Penman (1989) to interpret results from a model defeats the purpose of simplifying the application of financial statement information in investment decisions for individuals. As the focus is on the decision usefulness of financial statement information, incorporating the BM effect would further complicate the study. The Mohanram (2005) model's emphasis on specific expenditure would only apply to companies in a business cycle that necessitates the investment in such expenditures and in addition, comparisons to industry averages would further complicate the computation. The idea is that when an individual is faced with an investment decision relating to one specific company, the financial statements of that company should suffice without the need to obtain other industry related information. The application of financial statement information in the Noma (2010) model is limited as the F_score only looks at four signals as compared to nine signals which would broadly apply financial statement information. The information required by the PM is available on the

face of the Statement of Financial Position and the Statement of Profit and Loss, which brings consistency and the composite score is a relative measure that makes it easier to decide whether a specific company is strong and enables comparisons with other companies when constructing portfolios. Strong companies have a high chance of maximising returns while minimising risk for the investor. The PM was found to be easier to apply and requires normal algebraic skills to apply and interpret. This is of particular importance as the study aims to apply the model as a proxy to prove that financial reporting information is useful in making investment decisions.

2.5 SOUTH AFRICA AND THE JSE

South Africa is one of the top three economies in Africa and as such, attracts investment activity from both local and foreign investors (Peter, 2017). According to the International Monetary Fund (IMF, 2007), stock exchanges are useful tools for accelerating economic growth. To increase the quantity and quality of investment, investors require credible sources of information in order to part with their hard-earned money. Decision useful financial reporting information enhances the credibility of financial reporting information available to investors of the JSE. As the JSE listing requirements compels adherence to IFRS, JSE listed companies provide a good target to test the decision usefulness thereof.

2.6 SUMMARY

In conclusion, the literature review explains the evolution of the objective of financial reporting and explores the literature on decision usefulness of financial reporting information. Literature supports the application of accounting information in portfolio construction to enjoy above average market returns for equity investors. Literature has identified models that have been applied internationally in portfolio construction in order to identify strong companies that will maximise returns and minimise risk (Piotroski, 2000; Mohanram, 2005; Noma, 2010; Amedu, 2012). Through literature review, the PM has been identified as the appropriate research instrument to evaluate the research objective as a robust yet simple model that can be used as a proxy to prove that financial statements are decision useful for equity investors. The literature review therefore supports the

research objective. Additionally, the chapter focuses on how the PM applies financial reporting information to determine capital structure strength, efficiency and management's stewardship to enable users to determine expected future cash flows in making investment decisions.



CHAPTER 3

RESEARCH DESIGN

3.1 INTRODUCTION

The study identifies the PM as the main research instrument to apply financial reporting information from JSE listed companies to prove the decision usefulness of financial reporting information in making investment decisions. The 2006 financial year end was selected as the base year of analysis where a composite score was calculated for each company in the sample selected. The financial statements of companies that are listed under the Industrials Sector's Consumer Goods category of the JSE form the sample of the study. The composite score for each company is a sum of the results of the nine signals calculated according to the PM. The result of each signal was assigned a binary number 1 (defined as good) or 0 (defined as bad) depending on the outcome of each signal calculation in determining overall composite score (i.e. company strength). Each company's performance was then tracked over a two year, five year and eight year period using market values.

To analyse and interpret the results of the study, two portfolios were constructed: 1) Portfolio of companies with high composite scores; 2) Portfolio that excludes companies with low composite scores. These two portfolios were benchmarked against; 1) A portfolio comprising all companies in the sample and; 2) The ALSI. In addition, trend analysis was performed to demonstrate the relationship between the composite score and its respective three components and the performance over two year, five year and eight year periods using market values of share prices. The results are documented in Chapter 4.

The purpose of this chapter is to explain how the study is designed and organised to fulfil the research objectives. This chapter also summarises the design of the research with respect to the linking the research design to the PM including a definition of the signals, the determination of favourable or adverse signal outcomes, the philosophy, approach and sample selection relating to the research. The chapter will then summarise that the research design is adequate to meet the research objectives.

3.2 THE PIOTROSKI MODEL AND RESEARCH DESIGN

The following discussion of the PM is based on the studies by Piotroski (2000) and Galdi and Lopes (2013) who also applied the PM in their study. As depicted in the table below, the research strategy will be a quantitative study which assesses nine signals under three categories, namely: 1) capital structure; 2) performance and 3) operational efficiency (Piotroski, 2000).

The **capital structure** category analyses three components: 1a) Liquidity; 1b) Leverage; and 1c) Source of Funds. Liquidity is a measure of the company's ability to meet short term obligations while Leverage considers the extent to which the company is financed through debt and Source of Funds highlights whether the company is self-sustaining or if the shareholders have to inject capital in order to maintain operations. Increase in the use of debt, deterioration in liquidity and the use of external funding are seen as bad signs with respect to performance.

The **performance category** evaluates the company's ability to generate funds internally through profits and operational cash flows. The ability to generate operational cash flow or profits is viewed as a good sign with respect to the performance of the business. This category comprises four components: 2a) Current year return on assets (CY ROA); 2b) Cashflow generated from operations (CFO); 2c) Change in return on assets (Δ ROA); and 2d) Accrual. CY ROA calculates the ability of the entity to generate profits in relation to the resources at the entity's disposal during the financial year, while Δ ROA measures how the parameter for ROA has changed from one financial year to the other. This change signifies whether the entity is improving in its ability to generate profits from its resources from one financial year to the next. CFO is concerned about assessing the extent to which the profits generated translate into cashflow for the entity and Accrual measures the extent to which the performance is tied up in accruals.

The **operating efficiency** category measures management's ability to operate efficiently in applying the resources of the company to generate sales as well as the direction of the

company's margins. This category is made up of two signals namely, 3a) Change in margin (Δ in Margin); and 3b) Change in Turnover (Δ in Turnover). The higher the turnover generated from a unit of the assets, the stronger the company. In addition, growing margins are a good sign whereas shrinking margins are viewed as a threat.



Table 1 – Signal definitions

The definitions below further explain how each signal is calculated

1. Capital Structure	1a. Δ in Liquidity	The change in the current ratio from the previous year's current ratio. Current ratio is calculated as current assets divided by current liabilities.
	1b. Δ in Leverage	The change in the ratio between liabilities and assets from the previous year's ratio. The ratio is calculated as total liabilities divided by average total assets for the year.
	1c. CY Equity Offer	Capital contributions made by equity holders. Calculated as the difference between capital contributions at the beginning of the year and the balance at the end of the year.
2. Performance	2a. CY ROA	Represents the return on assets for the current year. This is calculated as the earnings before interest and tax for the current year divided by the asset balance at the beginning of the year.
	2b. CFO	The ratio between the cash flow generated from operations and the total assets at the beginning of the year.
	2c. Δ in ROA	The movement in the ROA from the previous year.
	2d. CY Accrual	Measures the proportion of the earnings before interest and tax that is tied up in accruals as a percentage of the total assets at the beginning of the year. This is calculated as the Earnings before interest and tax minus Cash flow generated from operations divided by the total assets as at the beginning of the year.
3. Operating Efficiency	3a. Δ in Margin	The movement in the margin of the company from the previous year. Margin is calculated as the gross profit for the year divided by the turnover.
	3b. Δ in Turnover	Turnover is the degree to which the total assets of the company are used in generating revenue for the company compared with the previous year. Calculated as turnover divided by total assets at the beginning of the year.

Source: Piotroski, 2000 adapted

3.2.1 Explanation of binary measure assigned to the results of each signal

The following discussion explains the calculation of the composite score per the PM. In addition, the section discusses binary measures assigned to the results of each calculation of the nine signals in more detail. The method followed in the calculations is based on the research approach applied by Piotroski (2000) and Galdi and Lopes (2013).

Piotroski (2000) allocates a proxy (binary) number (0 or 1) to the result of each signal calculated. A desirable result is allocated a binary number 1 and an undesirable result is assigned a binary number 0. The desirability of the results is based on the impact of each signal on the long-term profitability and market value per share. The final measure for a company's strength is referred to as the **composite score (F_Score)** which is the sum of all the binary numbers assigned to the nine signals. Since 1 represents a favourable position, the higher the F_Score, the stronger the company. The expectation is that the higher the composite score, the better the returns and company performance.

3.2.1.1 *Piotroski model: Change in Capital Structure*

Movement to a more aggressive current ratio and rising debt levels indicates increasing risk levels of the company and is therefore classified as a bad sign. Although Piotroski (2000) identifies literature supporting the fact that rising debt levels may be good for the entity, for this study his view is acknowledged that rising debt levels are a bad sign. In addition, an injection by equity holders may signify the entity's inability to stay afloat from internally generated growth. Consequently, a reduction in the current ratio; an increase in leverage and equity-offer is assigned a binary number of 0, and vice-versa.

3.2.1.2 *Piotroski model: Financial Performance*

This category is concerned with the ability of the company to generate profit using the assets the company started off with at the beginning of the year. In addition, this category considers the impact of accruals on the cash flow of the company representing the company's ability to generate cash from the business activities. Good signals include

where the company is generating profits; if the profits are growing from previous years and if the profits are not tied up in accruals and are being converted to cash flows on a timeous basis. The results are also assigned a binary measure of 1 or 0 depending on whether the result of the calculation is favourable.

3.2.1.3 *Piotroski model: Operating Efficiency*

This category consists of two signals that measure the growth in the company's revenue as well as the movement in the margin levels. Obviously, an increase in revenues is a good sign and dwindling revenues may be indicative of a loss of market share and reducing prices without a corresponding increase in the sales volumes. On the other hand, if margins are being squeezed, it is not a good sign for the company unless this is offset by a corresponding increase in sales volumes. Shrinking margins are a bad signal. Both measures give investors an ability to predict future trends and the impact on future equity instrument prices and profitability. This is an example of the predictive value of relevant decision useful information. Growth in revenue is viewed positively and assigned a binary number of 1 and a decline in revenue is assigned a binary number of 0. Consequently, shrinking margins are assigned a binary number of 0 and a growth in margin is assigned a binary number of 1.

3.4 RESEARCH PHILOSOPHY

Ontology is one's position with respect to the nature of reality (Saunders et al., 2012). This takes on a two-pronged approach, where one school of thought believes that reality exists in relation to the subjects of the experience known as subjectivity or social constructionism and the other school of thought holds that reality exists and is independent of those experiencing it (the knower) and is termed objectivity.

One's research philosophy is routed in the epistemological position of the researcher that describes what is acceptable as knowledge. Four epistemological positions can be identified, namely: 1) Positivism – holds that the research involves observable facts in a value-free way to establish law-like generalisations; 2) Realism – like positivism, assumes

a scientific approach that states that there is a reality that exists independent of the mind; 3) Interpretivism – instead of taking a strict approach, this approach accepts the role that humans play in understanding their role and their interpretation of the roles that others play in a particular setting and 4) Pragmatism which is a position that supports concepts that result in action.

Axiology is a branch in research philosophy that recognises that the researcher's value system creates judgements that remain prevalent in the research process (Saunders et al., 2012). This research is based on a positivist philosophy with an ontological position of objectivism, as company data can be collected and tested against the signals as defined in literature. Financial statements of companies listed on the JSE are published and this information does not depend on any influence from the researcher. The epistemology will result in observable results utilising the financial statement information from the selected companies in order to apply the PM to achieve the objective of financial reporting relating to equity investors. Since the results will be based on the information contained in the financial statements of JSE listed companies, the view is that the research takes on a value-free axiology. In addition, data collection techniques will be quantitative in nature.

3.5 RESEARCH APPROACH

Research approach refers to the way the research will be conducted as it relates to the literature, use of data and logic applied (Gaffikin, 2008; Deegan, 2010). The deductive research approach was applied to the study. As concluded in Chapter 2, literature supports the fact that financial statement information is useful in making investment decisions and can be analysed and applied in portfolio construction to generate above average market returns. This hypothesis which has been successfully tested in the US, UK, Asia and Brazil was tested on JSE listed companies. The research takes the view that equity investments are made for the long-term, consequently, the performance over two, five and eight year periods are tracked to demonstrate the validity of this hypothesis in the South African context. If the model is positively verified as a suitable proxy using the sample, the deductive inference will enable the application of the results in general to the

companies listed on JSE and be used as a simplified tool that could be applied by individual investors in equity instrument selection.

3.6 SAMPLE SELECTION

The study focuses on all the equity instruments listed under the Industrials Sector's Consumer Goods category according to the JSE in the 2006 financial year, which were still listed on the JSE on 31 May 2015 to cover the period of the study. The study focuses on a single industry to ensure that conclusions made are not influenced by industrial category nuances. Companies in the same industrial category are expected to broadly behave in a similar manner in response to market or economic considerations. The Industrials Sector's Consumer Goods category was selected as a means to contain the study to one sector which is representative industry of the behaviour of the JSE due to the diversity of companies encompassed therein.

Due to the input requirements of the PM, calculations and the corresponding analysis, the companies needed to be listed and have the required financial statement information for the 2004 to and including the 2006 financial year. This is because several the PM signals make use of opening balances from the statement of financial position for the current and prior financial years with reference to the base year of analysis (2006). In addition, the equity instruments needed to be listed until 31 May 2015 so that the market capitalisation information for the succeeding two, five and eight year periods from the portfolio construction date 31 May 2007 would be available. The 31 May 2007 date was chosen as a safe date that all information will be available for analysis as the JSE rules require financial results to be published within three months of the end of the financial year. The two, five and eight year periods were selected on the assumption that equity investment decisions are made for the medium to long term and to cover a complete investment cycle which is believed to span over a period of a year to ten or twelve years (Stock & Watson, 1998; Kaminsky & Schmukler, 2008). 2006 was selected as the base year of calculation for all equity instruments and performance of the equity instruments is tracked over a two year, five year and eight-year period. The performance is based on the market

capitalisation of the equity instruments as at 31 May 2009 (two years), 31 May 2012 (five years) and 31 May 2015 (eight years).

A total of 55 companies were identified according to the I-Net BFA database (available on www.inetbfa.com). The required data inputs were extracted from 2004 to 2015 to perform the following calculations: Current Assets, Current Liabilities, Total Assets, Total Liabilities, Earnings before Interest and Tax, Gross Profit, Turnover, Balance of Capital Contributions, Cash flow Generated from Operations, Book Value, Market Capitalisation, Closing Prices and ALSI prices over the analysis period. Assuming that the portfolios would have been constructed on 31 May 2007, the final sample is determined by equity instruments where data exists to support the 2006 base year; i.e. 2004 to 2006 depending on inputs required. The final sample consists of 29 companies under the Industrials Sector's Consumer Goods category.

3.7 SUMMARY

In summary, this chapter summarises the design of the research with respect to the philosophy and approach. The study takes on the positivist approach, using the PM as a proxy to test the decision usefulness of financial reporting information as per the Conceptual Framework for Financial Reporting (2015). The last section discussed the sample selection as well as the research period. The research methodology is sufficient to meet the research objectives.

CHAPTER 4

RESULTS

4.1 INTRODUCTION

This chapter documents the results obtained to validate the research objectives and conclusions drawn from the study. Furthermore, the chapter provides a link between literature and research design to support conclusions made from the study.

The results from the study show that financial reporting information, derived from financial statements of JSE listed companies, could be applied in constructing portfolios that yield superior returns. Therefore, understanding and applying the financial reporting information of the sample proved to be decision useful in making equity investment decisions.

The following section provides high level results of the two portfolios constructed after applying the PM to the companies in the sample. In addition, the section displays a comparison of the growth experienced in the two portfolios in contrast to the identified benchmarks.

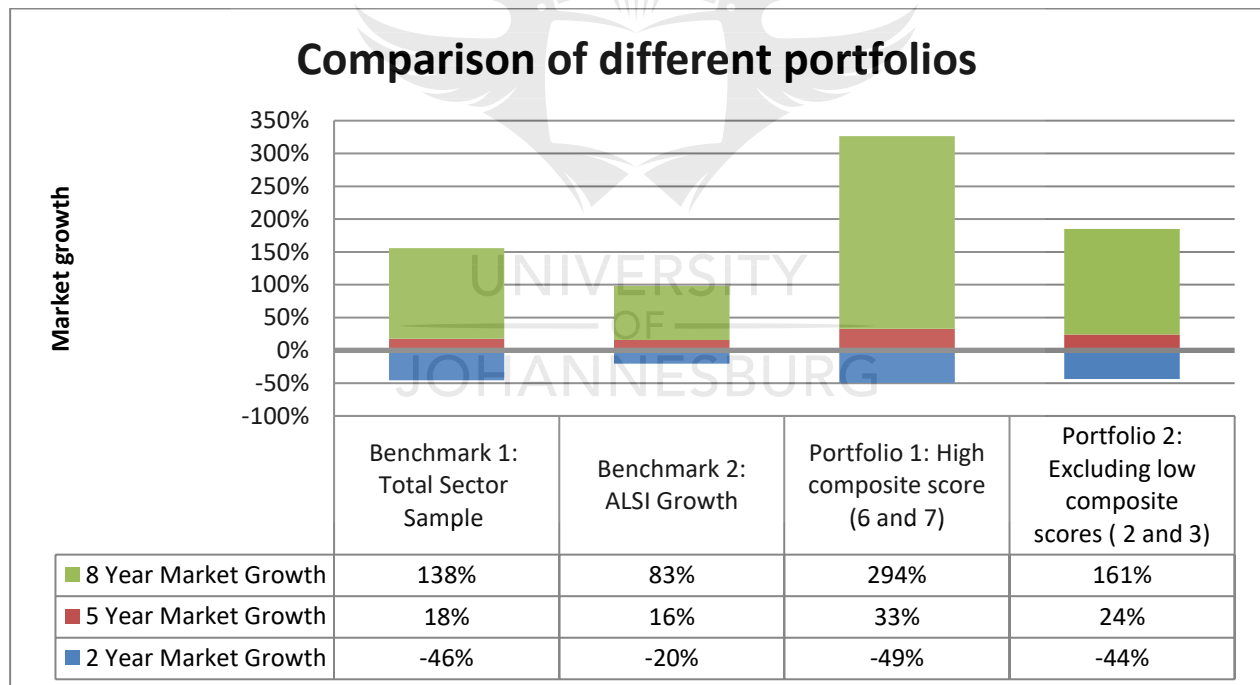
4.2 PORTFOLIO GROWTH COMPARED TO BENCHMARK

The study analyses the performance of two portfolios constructed, the first comprising high composite scores and the second eliminating companies with low composite scores. The high composite score portfolio produced returns of (3%), 15 % and 156 % higher (lower) when compared to the sector returns (total portfolio) over two year, five year and eight year periods. Comparing the portfolio to the ALSI indicates an increase (decrease) of (29%), 17% and 211% for two, five and eight years respectively. Additionally, the results show that a portfolio that excludes low composite score companies can increase returns by 2%, 6%, and 23% over two-year, five year and eight year periods when compared to the sector returns. The returns are increased (decreased) as follows: (24%), 8% and 78% when compared with the ALSI over two year, five year and eight year periods.

Superior results are consistently experienced over five and eight year periods. The credit crisis of 2007 and 2008 brought abnormal share performance. The portfolios selected performed worse than the sector overall during this period. These results are very difficult to unpack and interpret and it would be inappropriate to make any conclusions from them. The credit crisis as mentioned earlier is a limitation of the study.

The portfolio results are presented in Figure 2 clearly demonstrate the benefit of calculating a composite score when constructing portfolios for investment decision purposes. The figure displays that constructing a portfolio of high composite score companies maximises investment growth based on market values. In addition, sector performance can be enhanced by constructing a portfolio that excludes companies with low composite scores.

Figure 2: Comparison of different portfolios to benchmarks



The aim of this section is to demonstrate the high-level results for the two portfolios constructed in comparison with the two benchmarks selected (Total Sample Portfolio and the ALSI) and link the results to decision usefulness of financial reporting information. As the PM could be successfully applied to maximise equity returns of the portfolios, it can be concluded that the financial reporting information was decision useful.

The rest of the chapter will expand on the results of the study starting with an explanation of the approach taken to construct the two portfolios, a summary of the number of companies per composite score, the number of companies that showed favourable results per signal and the correlation between the composite score and three category scores against company performance. This will be followed by a summary and conclusion of the chapter.

4.3 APPROACH TO PORTFOLIO CONSTRUCTION

The PM was applied to all 29 companies in the sample and a composite score for each company was determined. Using the composite scores, two portfolios were constructed: 1) Companies with a high composite score of 6 and 7; and 2) Eliminating companies with low composite scores of 3 and below. The results of sample did not yield any scores above 7 and therefore scores of 6 and 7 were the highest in the sample. Similarly, there were no companies with scores of 0 and 1 in the sample, and therefore companies with scores of 2 and 3 were the lowest scoring companies. The performance of the two portfolios was tracked over two, five and eight year periods. The choice of the period to hold equity instruments was to demonstrate the impact of selecting equity instruments by applying financial reporting information from a short, medium and long term investment perspective in line with the literature review. The performance of the two portfolios was benchmarked against the portfolio of all companies in the sample for comparison purposes. In addition to the total portfolio, the performance on these portfolios was compared to the market returns for the JSE represented by the ALSI over the same period. Although the sector outperformed the ALSI, the results of the two portfolios are enhanced by selecting companies with strong composite scores or eliminating companies with low composite scores (refer to Figure 2).

Sections 4.4 and 4.5 below analyse the results in more detail to understand the spread of the companies based on the composite score and understand how many of these companies demonstrated strength as depicted by the nine signals. These detailed results

will lead into the trend analysis to determine which PM categories are strongly correlated to market growth as displayed in the figures in section 4.6.

4.4 NUMBER OF COMPANIES PER COMPOSITE SCORE

As depicted in Table 2 below: out of the sample of 29 companies, none had a composite score of 0, 1, 8 or 9. One company had a composite score of 2; 4 had a score of 3; 5 had a score of 4; 9 had a score of 5; 8 companies had a score of 6; and 2 companies had a score of 7.

Table 2: Number of companies per composite score

Composite score	Number of companies in sample
0	0
1	0
2	1
3	4
4	5
5	9
6	8
7	2
8	0
9	0
Total	29

4.5 NUMBER OF COMPANIES WITH FAVOURABLE RESULTS PER SIGNAL

The detailed results of the PM calculations for the 9 signals for each of the 29 companies in the sample are presented in Annexure A: Table 4 and to protect the companies' confidentiality, a proxy number was assigned to each of the companies from number 1 to 29. Below is a summary of the number of companies that produced favourable results with respect to each of the nine signals.

Table 3: Number of companies with favourable results per signal

Capital Structure	Δ in Liquidity	12 companies improved their liquidity ratios from the previous year.
	Δ in Leverage	10 out of 29 companies reduced their leverage in 2006 from 2005.
	CY Equity Offer	There were 18 out of 29 companies where the shareholders made equity contributions.
Performance	CY ROA	All 29 companies made a positive return on assets.
	CFO	26 had a positive cash flow generated from operations
	Δ in ROA	18 companies improved return on assets from the previous year.
	CY Accrual	6 companies generated more cash flow than the earnings in 2006.
	Δ in Margin	13 out of 29 companies improved margins.
Operating Efficiency	Δ in Turnover	16 out of 29 increased Turnover

4.6 CORRELATION BETWEEN THE COMPOSITE AND CATEGORY SCORES AND PERFORMANCE

This section analyses the performance of the companies in the sample over two, five and eight year periods. This is done by evaluating the average market growth per composite score as well as category scores for each of the three PM categories.

Presenting the results with a trend analysis of the two year, five year and eight year returns, an upward trend in average market growth is observed as the composite score increases (refer to Figure 3). This is in line with the expectation from the literature review that the higher the composite score, the better the returns. A strong correlation is depicted by the financial performance category where the higher the financial performance score, the market returns indicate a distinct upward trend (Figure 4). This is aligned to the findings in the study by Lee et al. (2011) who quote previous research as identifying profitability measures as strongly correlated to future equity performance. The capital structure category does not present strong enough patterns with market returns and the operating efficiency category indicates a declining trend. Despite these patterns for the capital

structure as well the operating efficiency categories, there is strong evidence that applying the composite score to portfolio construction yields superior results and the PM can be used as a proxy for decision usefulness to achieve the objective of financial reporting. The ultimate point of the PM is the total composite score.

Figure 3: Market returns per composite score

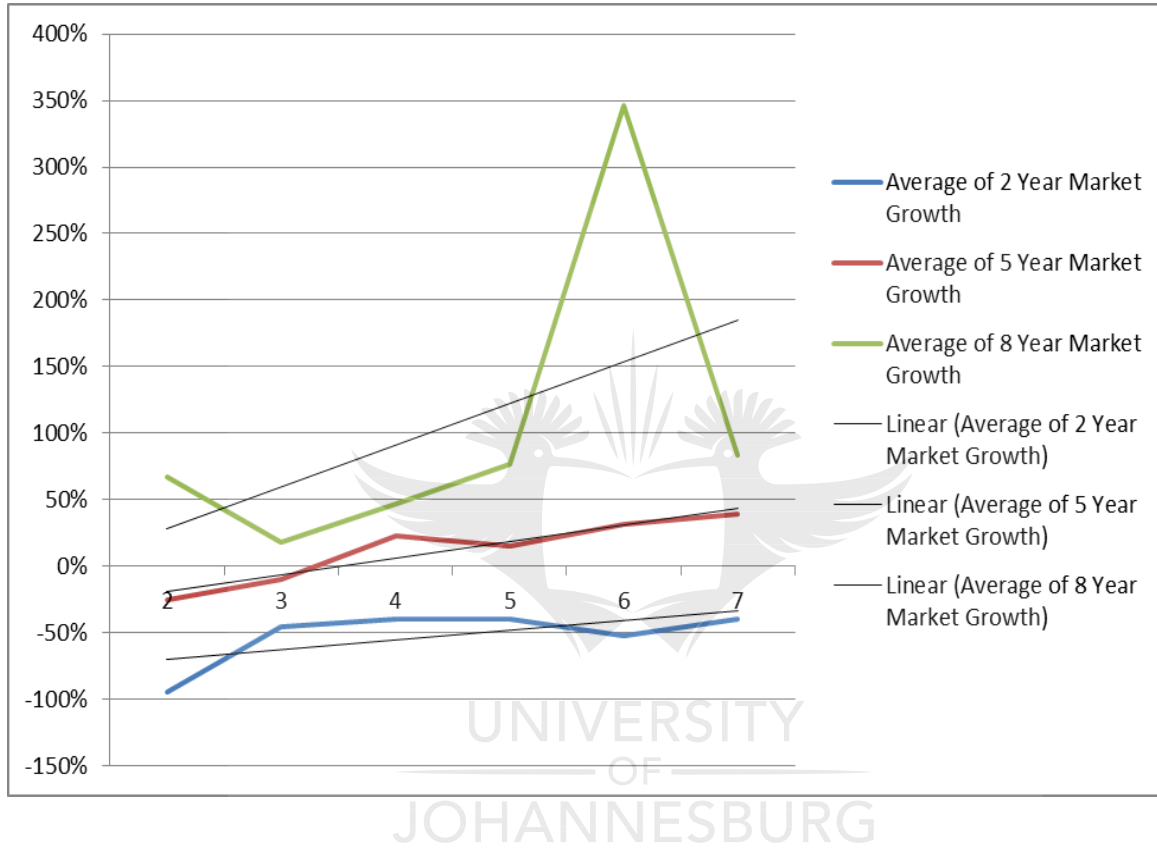


Figure 4: Market returns trends: Financial performance score

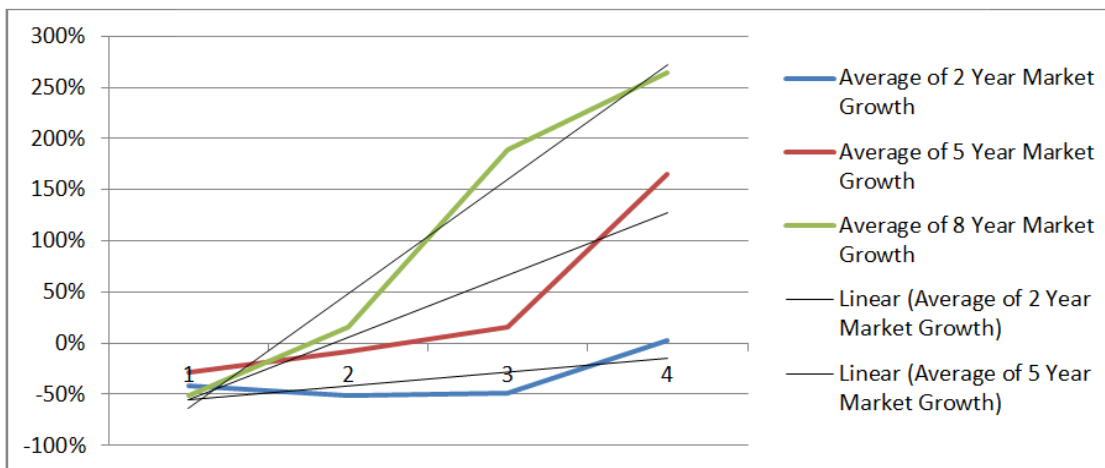


Figure 5: Market returns trends: Capital structure score

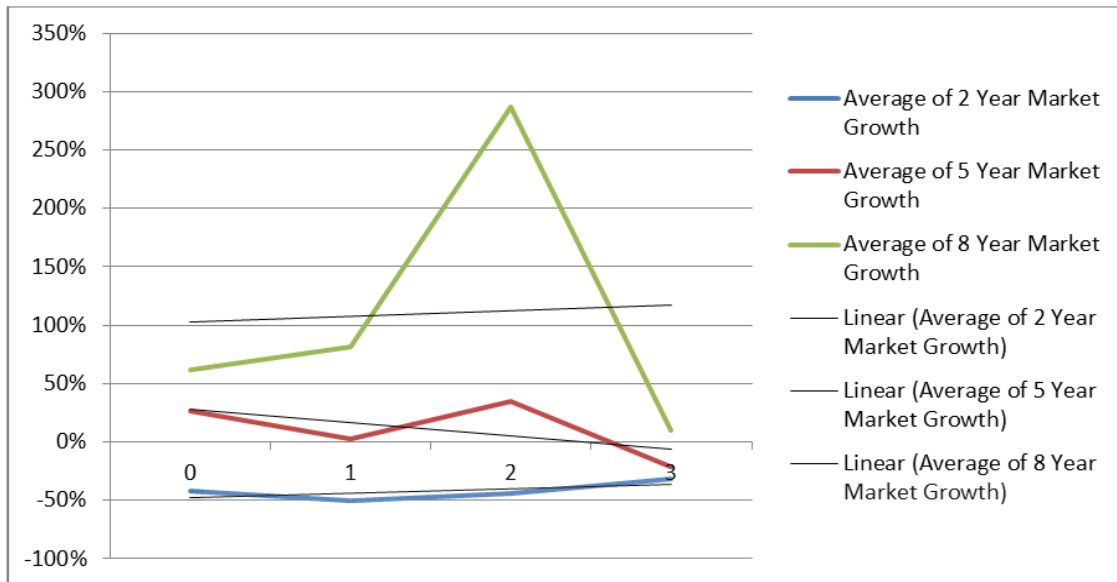
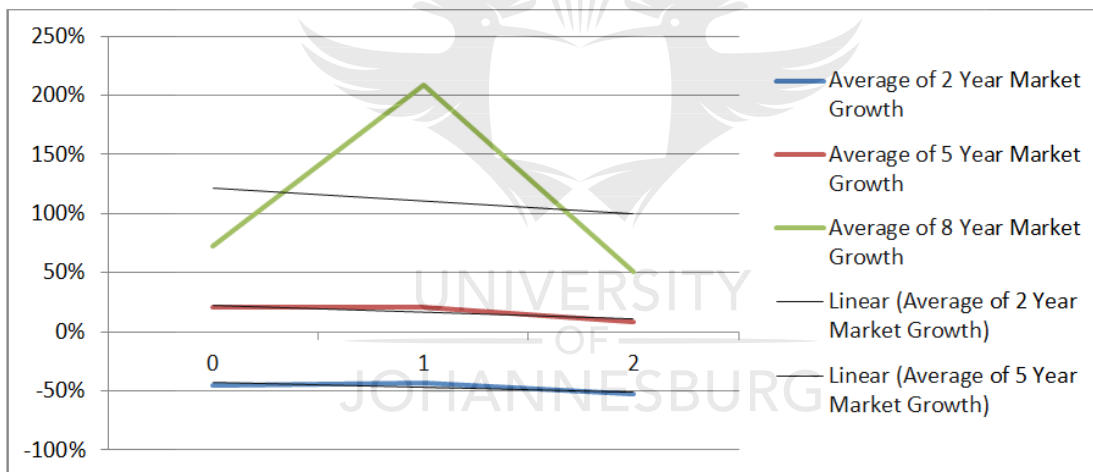


Figure 6: Market returns trends: Operating efficiency score



4.7 SUMMARY

The results show that financial reporting information was useful in making investing decisions and the PM could be applied as a suitable proxy to test the decision usefulness of financial reporting information. However, the financial performance category signals indicated the highest value relevance as opposed to the other two categories. The results recorded indicated superior returns over five year and eight year periods. The results over the short-term indicated inferior returns, however as these results incurred during the

credit crisis of 2007 and 2008 it was not further unpacked and purely treated as a limitation of the study. The view is taken that it would be inappropriate to form conclusions from these results.



CHAPTER 5 CONCLUSION

5.1 INTRODUCTION

This chapter records how the objectives of the research were met. For each objective, the chapter provides context, demonstrates the findings of the study as well as interpret the results. The two objectives of the study were as follows: 1) contributing to the decision useful literature by extending findings of previous research to the South African context; and 2) evaluating whether the PM could be applied as a suitable proxy to test the decision usefulness and improve the understanding of financial reporting information for JSE listed companies when making equity investment decisions. Both objectives were met and the findings and results were interpreted and documented in the following sections. The conclusion incorporates areas identified and not addressed as part of this study which could become suitable subjects for future research.

5.2 CONTRIBUTION TO DECISION USEFULNESS LITERATURE

The study identifies three important areas with respect to decision usefulness literature namely: 1) the objective of financial reporting; 2) ability to determine future cash flows and the related risk to obtain those cash flows and management's stewardship; and 3) qualitative characteristics of decision useful financial reporting information.

The literature review successfully linked the study with the objective of financial reporting as defined by the IASB (2015) and singles out the needs of equity investors in the research design. The research proves that equity investors can apply financial reporting information in making investment decisions.

The study successfully determined the direction of future cash flows depicted by average market returns in that strong companies provided superior average market returns over the research period compared to the benchmarks applied. Literature identifies two methods under the FA approach by which investors make an assessment of expected

future cash flows. The first method focuses on determining a valuation for the company and the second method is concerned about value relevant financial reporting information which predicts the direction of future earnings and or prices of equity instruments. The PM follows the second method and was applied to analyse financial reporting information of JSE listed companies in three categories. The model works on the premise that companies with higher composite scores should demonstrate higher market returns while managing the risk inherent in the company.

The overall results showed that five year and eight-year market returns increased with higher PM composite scores. Portfolios that excluded companies with low composite scores or only included companies with high composite scores produced returns that were superior to both the sector and the average market returns as represented by the ALSI. The credit crisis of 2007 and 2008 brought abnormal results over the short- term and therefore no conclusions for formulated from this result.

The most important information need for equity investors is information that enables them to maximise equity returns (Swartz, 1995). The study therefore contributes to the decision usefulness literature by concluding that financial reporting information of JSE listed companies could be applied in investment decisions that maximised investor returns. Although the study is strongly linked to the relevance qualitative characteristic, the literature review was able to link the PM and study to the other qualitative characteristics. The discussion therefore proves that the study contributes to the decision usefulness literature.

5.3 IS THE PIOTROSKI MODEL A SUITABLE PROXY TO DETERMINE DECISION USEFULNESS OF FINANCIAL REPORTING?

A secondary objective was to test the PM as a suitable proxy to test the objective of financial reporting. Although all the three category results did not behave in the expected manner, strong companies with higher overall composite scores showed superior market returns. The model can thus be applied as a suitable proxy to test the decision usefulness of financial reporting information for equity investors. Additionally, the study intended to

prove whether the PM can be a simple tool for individuals in analysing the financial statements of target investment companies. The PM provides a mechanism to perform financial statement analysis as per Swartz (1995), quoting International Valuation Standards (2005), where the monetary values in the financial reports of the companies were evaluated using various percentages and ratios to understand the financial returns as well as the level of risk in the business. The binary figures allocated to the different scores made it easier to compare different companies. Portfolios that excluded low composite score companies reduced the risk of not meeting the investment returns and a portfolio of high composite score companies could maximise investors' returns. The study recognises that while financial reporting information is not the only source of information for making investment decisions, the PM could assist investors as a tool to select strong companies. Additional considerations would then be applied in making the final decisions.

5.4 SUMMARY AND RECOMMENDATION FOR FUTURE STUDIES

In conclusion, the study objectives were met and the results of the study confirm the work that was performed in other jurisdictions, could be successfully applied to the South African context. By applying the PM to analyse financial statement information, the objective of financial reporting was met and it can be concluded that the financial reporting information of JSE listed companies was useful in making equity investment decisions. The study could eliminate weak companies and identify strong companies in order to maximise returns above the market and the sector sample.

To extend this study, future research could apply the model on a yearly or bi-annual basis to rebalance the portfolio. It is important to note that longer-term returns over eight year periods, indicated the biggest wins for the portfolio tested. When rebalancing, the long-term time horizon of equity investments should be considered. Another approach could be to analyse the gap between the book value of equity and market prices in addressing the value relevance of financial reporting information for highly technological, service and knowledge driven companies with a high degree of internally generated goodwill.

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ANNEXURE A

Table 4: Detailed results per company

Company Name	Proxy	Composite Score	Δ in Liquidity	Δ in Liquidity Result	Δ in Leverage	Δ in Leverage Result	Equity Offer	Equity Offer Result	Capital Structure Result (out of 3)	ROA	ROA Result	Δ ROA	Δ in ROA Result	CFO	CFO Result	Accrual	Accrual Result	Financial Performance Result	Δ in Margin	Δ in Margin Result	Δ in Turnover	Δ in Turnover Result	Operating Efficiency Result
1	2	-4%	0	7%	0	12,906	0	0	11%	1	-4%	0	9%	1	2%	0	2	-2%	0	-27%	0	0	
2	3	-7%	0	-1%	1	58,541	0	1	24%	1	-2%	0	12%	1	12%	0	2	-1%	0	-10%	0	0	
3	3	-2%	0	3%	0	84,565	0	0	17%	1	-4%	0	0%	1	17%	0	2	-6%	0	68%	1	1	
4	3	-14%	0	54%	0	271,505	0	0	20%	1	-4%	0	334%	1	-314%	1	3	-2%	0	-5%	0	0	
5	3	-18%	0	19%	0	2,354	1	1	5%	1	-2%	0	-1%	0	6%	0	1	0%	0	21%	1	1	
6	4	6%	1	-3%	1	10,088	0	2	22%	1	1%	1	-1%	0	23%	0	2	-2%	0	-4%	0	0	
7	4	-43%	0	-5%	1	12,724	1	2	10%	1	-7%	0	10%	1	1%	0	2	-2%	0	-50%	0	0	
8	4	-32%	0	3%	0	14,600	0	0	10%	1	-3%	0	10%	1	0%	1	3	-19%	0	2%	1	1	
9	4	-11%	0	9%	0	27,500	0	0	31%	1	2%	1	10%	1	22%	0	3	2%	1	-25%	0	1	
10	4	-7%	0	23%	0	834	1	1	15%	1	4%	1	-7%	0	22%	0	2	2%	1	-39%	0	1	
11	5	-9%	0	-1%	1	21,000	0	1	15%	1	3%	1	12%	1	2%	0	3	-4%	0	5%	1	1	
12	5	24%	1	-5%	1	-	0	2	26%	1	-7%	0	1233%	1	-1208%	1	3	-4%	0	-9%	0	0	
13	5	2%	1	2%	0	-	0	1	16%	1	7%	1	14%	1	2%	0	3	4%	1	-3%	0	1	
14	5	-44%	0	2%	0	2,660	0	0	23%	1	2%	1	8%	1	15%	0	3	0%	1	9%	1	2	
15	5	15%	1	6%	0	904,000	1	2	15%	1	-5%	0	11%	1	3%	0	2	-2%	0	4%	1	1	
16	5	-32%	0	10%	0	135	1	1	28%	1	-6%	0	30%	1	-2%	1	3	-6%	0	22%	1	1	
17	5	149%	1	0%	0	2,140,000	0	1	11%	1	9%	1	2%	1	9%	0	3	37%	1	-5%	0	1	
18	5	-17%	0	6%	0	-	0	0	21%	1	3%	1	25%	1	-4%	1	4	-1%	0	2%	1	1	
19	6	-6%	0	10%	0	-1,070,000	1	1	16%	1	3%	1	12%	1	3%	0	3	1%	1	14%	1	2	
20	6	22%	1	1%	0	239	0	1	22%	1	21%	1	14%	1	9%	0	3	10%	1	14%	1	2	
21	6	5%	1	8%	0	-1,320,944	1	2	18%	1	1%	1	12%	1	6%	0	3	0%	0	20%	1	1	
22	6	-12%	0	13%	0	732	1	1	5%	1	4%	1	0%	1	5%	0	3	1%	1	14%	1	2	
23	5	7%	1	-7%	1	252,852	1	3	23%	1	-13%	0	14%	1	9%	0	2	-18%	0	-33%	0	0	
24	6	-44%	0	32%	0	61,051	1	1	15%	1	2%	1	21%	1	-6%	1	4	4%	1	-41%	0	1	
25	6	16%	1	-6%	1	230	0	2	6%	1	26%	1	1%	1	6%	0	3	37%	1	-3%	0	1	
26	6	49%	1	-14%	1	5,261	0	2	24%	1	9%	1	1%	1	23%	0	3	-1%	0	51%	1	1	
27	6	-20%	0	12%	0	-1,108,900	1	1	15%	1	3%	1	7%	1	8%	0	3	1%	1	7%	1	2	
28	7	13%	1	-5%	1	-	0	2	27%	1	3%	1	0%	1	27%	0	3	1%	1	54%	1	2	
29	7	7%	1	-1%	1	-	0	2	38%	1	11%	1	1%	1	38%	0	3	1%	1	31%	1	2	



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