

THE VALUE OF FINANCIAL RATIO ANALYSIS IN PREDICTING THE FAILURE OF JSE LISTED COMPANIES

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DECLARATION

I declare that: **THE VALUE OF FINANCIAL RATIO ANALYSIS IN PREDICTING THE FAILURE OF JSE LISTED COMPANIES** is my own work; that all sources used or quoted have been indicated and acknowledged by means of complete references, and that this mini-dissertation was not previously submitted by me or any other person for degree purposes at this or any other university.

SIGNATURE

DATE

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I want to give all the honour, glory and praise to the author and finisher of my faith JEHOVAH JIRAH who has provided me with the ability to successfully complete this dissertation.

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I want to dedicate this dissertation to my father that has passed Reginald Mecuur he always had confidence in my abilities.

ABSTRACT

THE VALUE OF FINANCIAL RATIO ANALYSIS IN PREDICTING THE FAILURE OF JSE LISTED COMPANIES

Key words: Financial Ratios (FR), financial ratio analysis (FRA), bankruptcy, company failure, company performance, financial health, financial statements, Johannesburg Stock Exchange

The objective of this study investigated the successful prediction of business failure of JSE listed companies using financial ratio analysis. During the research, financial statement data of failed and non-failed JSE listed companies during 2007-2012 financial periods were analysed, compared and interpreted. The interpretation of the trends and comparisons is of a quantitative nature, together with a qualitative genre which examines the tables, figures and equations in order to get the entire picture of the company's performance for a five year period. The combination of literature on various failure predictor models and experience of these models resulted in the development of a modified model.

The conclusion from the study indicated that financial ratio analysis successfully predicts failure and non-failure of the 16 companies that were investigated. These companies were grouped into eight delisted (failed) and eight listed (non-failed) JSE companies, which were paired in accordance to industry, fiscal period and closest asset size.

The adoption of the traditional ratio analysis methods and EMS model yielded some interesting findings. The traditional ratio analysis methods (trend and comparative ratio analysis) were used with the Emerging Market Score (EMS) Model. The outcomes indicated the traditional methods are viable company failure prediction tools and the EMS model points out companies at a score of 2.60 and above as being financially stable. Between 2.60 and 1.10 the results are not very dependable because it is known that the company is in distress, yet uncertain whether the company has financially failed and below 1.10 the company has failed. It was concluded that a combination of the various prediction models enhances the accuracy of failure prediction.

Therefore further research is required to assist stakeholders of South African companies to predict business failure by developing an adjusted model in a South African context.

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LIST OF ACRONYMS

n	Number
R	Rands
\$	Dollar
€	Euro
ALC	Almac Limited
ARTO	Accounts receivables turnover
BCBS	Basel Committee of Banking Supervision
BIS	Banking for International Settlements
BRICS	Brazil, Russia, India, China and South Africa
CACL	Current Asset / Current Liabilities
CF2D	Cash Flow to Debt
CFR	Compagnie Financiere Richemont
CIMA	Chartered Institute of Management Accountants
D2E	Debt to Equity
DLG	Dialogue Group Holding Limited
DR	Debt Ratio
EBIAT	Earnings before interest after tax
EBIT	Earnings before interest and tax
EMS	Emerging Market Score
Excl	Excluding
F	Failed
FIFO	First In First Out
FSD	Financial Statement Data
GIGO	Garbage In Garbage Out
HIP	Human Information Processing
HWN	Howden-Africa Holding
IntC	Interest Cover
IT	Information Technology
ITO	Inventory turnover
JSE	Johannesburg Stock Exchange
LIFO	Last In Last Out
LTD	Limited
MDA	Multiple Discriminant Analysis

MTA	Metair Investment Limited
NEI	Northern Engineering Industries Limited
NPM	Net profit margin
OPM	Operating profit margin
PAL	Pals Holdings
QACL	Quick Assest / Current Liabilities
RAG	Retail Apparel Group Ltd
ROA	Return on Assets
ROE	Return on Equity
SER	Seardel Investments
SHF	Steinhoff International Holding Ltd
SHP	Shoprite Holding Ltd
SOCE	Statement of Changes in Equity
SOCF	Statement of Cash Flow
SOCI	Statement of Comprehensive Income
SOFP	Statement of Financial Position
TATO	Total asset turnover
TIE	Times interest earned
TIW	Tiger Wheels Limited
TRX	Terexko Limited
UK	United Kingdom
Vs	Versus
WES	Wesco Investment Limited
WHL	Woolworths Holding Limited
WKF	Workforce Holding
WOW	Who Owns Whom
Y1	Year one
Y2	Year two
Y3	Year three
Y4	Year four
Y5	Year five

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 BACKGROUND AND RATIONALE

Trade Economics (2013) reported that more than 61 032 companies failed globally over the past 10 years, of which 20 000 where in the United States of America (USA). South Africa (SA) did not escape this fate, as Stats SA (2013) reported that more than 2 400 companies failed in the period 1980 to 2013.

According to Charitou *et al.* (2004:466) “*the phenomenon of financial distress that leads to business failure attributes to high interest rates, recession-squeezed profits, heavy debt burdens, industry-specific characteristics, government regulation and the nature of operations*”. Charitou (2004:465) argues the most significant threat for any business, despite size or nature of operations, is insolvency. Tuvadaratragool (2013:1) cites various reasons for the dissolving of companies from the open market, namely financial distressed, liquidation and acquisition. Fitzpatrick indicates (cited by Tuvadaratragool, 2013:1) stakeholders; likely to be affected by investments in financially distressed companies are employees, banks, creditors, shareholders, community and government, irrespective of what event triggered the company’s disappearance. Charalambous *et al.* (2000:403-425) demonstrates that the market value of distressed companies declines substantially prior to their ultimate collapse. Tuvadaratragool (2013:1) concludes failure prediction is highly beneficial because of financial trauma (high costs and heavy losses).

Charitou *et al.* (2004:466) proposed that there is a need for reliable empirical models that predict company failure promptly and accurately, to enable stakeholders to take either preventive or corrective action. Anjum (2012:213) discusses many prediction models that have been studied by various researchers dating back to the 1930’s. Ahmad (2010:7) and De Vos *et al.* (2011:254) explain that WH Beaver, a professor at the Stanford University, developed the first bankruptcy prediction model called the univariate model, describing it as using one variable. According to Balcaen and Ooghe (2006:65), univariate analysis has advantages. The method is simple, statistical knowledge is not required and disadvantage as the assumption associated with this method is limited. Altman (1968:591) introduced the multiple discriminant

analysis known as MDA in failure prediction and Eidleman (1995:52-53) posits the MDA as being the most popular method in the discrimination between failed and non-failed companies. Altman (1968:592) describes the MDA as a technique where all the frequent financial ratios for applicable companies are considered simultaneously and Beaver (1966:100) defined it as “a *multiratio analysis, when a number of different ratios are used*”. Ohlson (1980:112) suggests one of the disadvantages of MDA is that predictors are levied with certain compulsory statistical requirements, for instance the variances and covariance of the set of conditions of the predictors should be the same for both the failed and non-failed companies. Altman and Hotchkiss (2006:3) report that prediction of company failure events only gathered momentum from the 1970s in the USA. Frequently quoted studies in this field are from Beaver (1966) and Altman (1968). These two studies are based on financial ratio analysis and develop an appropriate instrument for predicting business failure. Correia *et al.* (2011:5.38) argue that financial ratios analysis was designed with the intention to determine a company’s strengths and weaknesses, and can only be done if there is some kind of benchmark to compare it to. A company must be compared with another in the same industry. Beaver (1966:74) stated that the use of the pairing approach provides control. This study followed the method used by the above-mentioned authors as the non-failed or non-bankrupt companies are the benchmarks against which the failed or bankrupt companies are measured.

The study examines the ability of financial ratio analysis to forecast business failure, utilising techniques which are well developed and are widely accepted. This investigation employs comparative financial ratio analysis and various failure prediction models. The data covering the period 2007 to 2012 of South African listed companies formed the basis of this study.

In a globalized society, companies face constant and rapid changes in technology and exchange rates. Correia *et al.* (2011:1.16) states that financial managers need to find opportunities to create wealth for the company in a continuous changing environment. It is sometimes inevitable that companies will fail, regardless of the efforts of all stakeholders.

Edmister (1972:1477-1478) supports the studies by Beaver (1966), Altman (1968) and Blum (1974), conducting and concluding that the financial ratios have the ability to predict company failure up to five years before the occurrence of the event.

Correia's above argument is in line with the thoughts of Altman (1968) and Beaver (1966), as both their samples utilize the pairing approach, comparing bankrupt companies with non-bankrupt companies. Considering the above, raw data can be extracted from the financial statements and, by applying financial ratio analysis, still predict business failure effectively.

1.2 PROBLEM STATEMENT

The problem statement was developed from looking at the failure rate of companies globally. The relevance of financial ratio analysis that was introduced in the 1930s in today's changing environment is questioned. In doing a primary literature review, it became evitable that researchers focus on how ratio analysis successfully predicts business failure. Therefore it became clear that what needs to be determined, must be the ability of ratio analysis successfully predicting business failure in the current business environment. The gap that has been identified is different. Authors use different financial ratios within their model as their focus differs; the financial ratios are not being integrated. Another gap is that the literature encourages financial ratios to be above the rule of thumb, for instance the current ratio is favourable if 2:1 or above. This study will show that, if financial ratios are much higher than the rule of thumb, it can be considered a warning sign.

The purpose of the study is to investigate whether financial ratio analysis can successfully predict business failure of Johannesburg Stock Exchange (JSE) listed companies in the current global environment. Since there have been vast changes in the global economic environment, the market and technology, anyone can now order anything directly from anywhere in the world via internet. The problem is a question that was identified at the time, in the mist of all these changes that have being taking place over the years, is the financial ratios that were developed in the 1930s still effective and useful in predicting business failures in the current business environment? When various ratios, combining the different models within different industries are integrated, they may be a better predictor of failure.

1.3 OBJECTIVES OF THE STUDY

The following objectives have been formulated for the study:

1.3.1 Primary objectives

The primary objective of the study is to investigate the successful prediction of business failure of JSE listed companies by using financial ratio analysis.

1.3.2 Secondary objectives

In achieving the primary objective, the following supporting secondary objectives are formulated for the study:

- Investigate the use of financial ratio analysis as a reliable tool in predicting business failure.
- Examine the principles of financial ratio analysis and also establish if these same principles are useful and can be applied as a guideline today.

1.4 RESEARCH DESIGN AND METHODOLOGY

The study will comprise a literature review and an empirical review, using a mixed method research approach consisting of both qualitative and quantitative methods.

1.4.1 Literature Review

Embarking on an extensive literature review of the development, use of ratio analysis and various failure prediction models to gain an understanding of theories and how they are used in practice. Sources include relevant textbooks, peer review journal articles, newspaper reports, and internet as well as published annual financial statements for 2007 to 2012.

Financial ratios are one of the critical components of this study as Gouws and Lucouw (1999:107-108) explains. Data is transformed and expressed as ratios; understanding is attained when the ratios are comparable to other ratios. Beaver (1966:71-72) defines financial ratios as *“a quotient of two numbers, where both numbers consist of financial statement items”*. A large number of financial ratios are derived from financial statement data in the statement of financial position (SOFP) (known as the balance sheet), and the statement of comprehensive income (SOCFI) (known as the income statement). Previous studies use historical financial statement information and examine the ability to predict failure in a South African environment. Secondary data form the basis of this study, since the target population is public

companies listed on the Johannesburg Stock Exchange (JSE) and the financial data from financial statement to reports are readily accessible from the reputable McGregor BFA database.

1.4.1.1 Theoretical objectives of the study

- Conducting a literature review on the financial ratios and bankruptcy prediction models, their development and rationale behind the development will give a better indication of their usefulness.
- The validity of both the financial ratios and bankruptcy models can be determined through the literature review.

1.4.2 Data Collection

Welman *et al.* (2005:134) posit that *“each data-collecting method and measuring instrument has its own advantages and drawbacks. Furthermore, what counts as an advantage for one, may qualify as a drawback for another”*. Maree (2013:263) proposes that a mixed method approach using a combination of qualitative and quantitative methods will enhance the study and will be helpful in understanding theory, measurement instruments, different perspectives and relationships between variables. Data collection for this study will proceed by the selection of predictor variables, as the study employs a relatively large number of financial ratios, proved to be successful in predicting company failure in prior studies. The major categories of ratio testing are as follows: debt management also known as financial leverage or solvency ratios, operating cash flow, liquidity, asset management also known as efficiency ratios and profitability. A list of financial ratios tested in the study will be presented in a table which will include, under each ratio, the variable name and definition.

1.4.3 Empirical Review

Zikmund (2003:65) concludes that research methods can be divided into four types: surveys, experiments, secondary data studies and observations. Secondary or historical data are data originally gathered by previous studies for some purpose while primary data are data gathered by current studies for a specific purpose (Cavana, Delahaye & Sekaran 2001; Davis 2005; Neuman 2006; and Zikmund 2003).

The empirical study will be conducted using JSE listed companies as the target population generating data from JSE portals, namely the McGregor BFA (version number IP 143.160.190.156) database and who owns whom website for the period 2007 to 2012. JSE listed companies have been selected for their accessibility, reliability and publically availability of information. The sample consists of delisted JSE companies for the above mentioned period focusing on failed companies.

The non-probability sampling technique known as quota sampling is used to select the sample from the target population. Leedy and Ormrod (2014:220) describe quota sampling as a sampling technique that selects items, not in a random manner, but in the same proportion. Babbie (2013(a):75) clarifies this explanation by stating the selection of items in this sampling type is based on characteristics that are pre-specified. The rationale for this selection method is that the same characteristics exist in the total sample of the population being studied. In order for companies to be selected in the case of this study, they will have to meet the determined criteria. The sample has been divided into two groups 1) delisted companies and reasons for delisting given and 2) delisted companies that fit the dataset of the failed company's financial statements to be analysed.

1.4.3.1 Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives are formulated:

- Identify the JSE listed companies that failed over the period of 2007 to 2012 with accompanying reasons.
- Establish if financial ratio analysis and failure prediction models can identify failure timeously, making use of failed JSE listed companies.
- Test the reliability of financial ratio analysis and failure prediction models against the top 40 JSE listed index companies.

1.4.4 Measuring instrument and data collection method

This section is organised into the data analysis which has been divided into the instruments used to measure the data and the method applied to collect the data.

1.4.5 Data analysis

Grove (2007:34) posits that *“the analysis techniques identified need to be appropriate for the type of data collected”*. The purpose of data analysis according to Grove *et al.* (2012:46) is to reduce, organize and give meaning to the data. The data will be analysed by breaking it up into smaller sections by creating constructs and then analysing them on the following levels, taking into consideration the explanation by Welman *et al.* (2005:136) that the constructs will be indirectly measured.

Furthermore, this study is designed to explore the ability of financial statement information to predict business failure in a South African context. Analytical techniques used, are comparative financial ratio analysis, ratio trend analysis and the emerging market score model (EMS).

1.4.6 Ethical considerations

Information revealed in this study is mainly obtained from the public domain and is deemed to be public knowledge. The study will, however, comply with the minimum ethical standards pertaining to academic research.

1.5 CHAPTER CLASSIFICATION

This study will comprise the following chapters:

Chapter 1 Introduction and background to the study: An introduction to the study and a background to the research is provided, followed by the research problem and research objective containing primary, secondary, theoretical and empirical objectives. Thereafter a summary of the research methodology and the justification thereof is described. Lastly the outline of the study is provided.

Chapter 2 Literature review: The literature on bankruptcy and the causes thereof will be reviewed. To attain gaps in the studies of company failure in South Africa, the development and the theoretical background of company failure prediction models within South Africa and elsewhere are provided. The generic terms used in previous studies and the usefulness of business failure models are included. The evolution of financial ratios and financial ratio analysis will be explored and the financial ratios as cornerstones of different bankruptcy models are addressed.

Chapter 3 Research design and methodology: A description of the research stages, research problem and formulation of the research is given, followed by the research design, the target population and the sampling methods. The chapter further describes the data collection, data analysis and the analytical process thereof.

Chapter 4 Data analysis (Results and findings): A design to analyse the data collected is presented. The sample used is described, followed by the profiling of the financial ratios, financial statement, companies and the assets size used are discussed. The chapter commences with descriptive statistics measures adopted which was the mean, the analysis of the data and the methods applied according to the methodology portrayed in Chapter 3.

Chapter 5 Conclusions and Recommendations: The results of the objectives and problem statement are presented, followed by the summation of the previous chapters. The chapter continues with the study's limitations, conclusions, contributions and recommendations. Finally, suggestions for further studies are presented in conclusion of the chapter.

CHAPTER 2

THE PRINCIPLES OF FINANCIAL RATIO ANALYSIS

2.1 INTRODUCTION

This chapter will consist of the literature review considering relevant textbooks, scholarly articles, the internet and other relevant published information. The causes of bankruptcy, development of financial ratios and failure prediction models, determining what financial ratios are important to different bankruptcy prediction models and determining which financial ratios need to be considered in the empirical study. The principles of ratio analysis will be reviewed, to place the role and effectiveness of financial effects namely liquidity, solvency, profitability and asset management in perspective. During the course of this review it will become evident that a company's financial distress depends among others on the relationship between bankruptcy and managerial errors. Furthermore, the influence of the global financial crisis on bankruptcy is visited and the development of financial ratios and financial distress models will be discussed.

Various financial distress models will be analysed; these will include the financial ratio, cash flow, return and return variation and the variance of return variable models. Timely preventative measures need to warn stakeholders against bankruptcy. The chapter will consider four accepted techniques or models. The vital importance of the different models that exist, the correlation thereof and the seminal studies conducted by pioneers in the field will also be looked at. Previous studies include Beaver (1966), Altman (1968), Blum (1974) and Edmister's (1972) model. The failing company doctrine will be studied in order to understand the South-African's studies of Hlalhla (2010) and Rama (2012). Part of the chapter will contain a summary of the financial ratios that form the cornerstone of the previous studies. The chapter concludes with a brief discussion on why the study only considers certain financial ratios in obtaining data for the empirical study.

Faber (2012) concludes that Stewart McKinney popularized the phrase "*too big to fail*" as it was also used in relation to the Lehman Brothers in 2007 during the global financial crisis. The phrase was proved to be untrue in 2005 with the fall of Enron, the

US company that had \$31.2 billion in liabilities excluding off-balance liabilities, which was one of the largest bankruptcies due to fraud.

2.2 CAUSES OF BANKRUPTCY

2.2.1 Introduction

Altman and Hotchkiss (2006:4) illustrate that corporate well-being can no longer be represented by size. Describing whether a company is insolvent involves 1] its being unable to repay debt; 2] it having failed, which is to be unsuccessful; 3] bankrupt being legally declared unable to repay debts; and/or 4] default in failing to honour a financial obligation. (Cambridge Advance Learner's dictionary, 2010:104-747). Various authors, including Altman and Hotchkiss (2006:4), say that these four terms are commonly used and referred to as the four generic terms when economic problems are involved

Business operations and the risk of bankruptcy is an inherent risk. They cannot be separated from each other. Ijaz *et al.* (2013:864) propose that the bankruptcy rate vary between developed and developing countries, due to the difference in a country's political, social, legal and capital structures, as well as different accounting policies, economic sectors, input cost, product demand and how lenient lending policies and credit availability are. Stats SA (2013) reported the range of South African bankruptcies on a monthly frequency at being 63 companies at the lowest in May 1988 and at the highest at 511 companies in August 2000. This is in relation to the quarterly frequency bankruptcies of the USA and the United Kingdom (UK) (TE, 2013). Company bankruptcies are caused by financial and non-financial factors.

2.2.2 Causes of bankruptcies

Previous studies of the failure process have been conducted by Laitinen in 1993 and took into consideration non-financial causes of bankruptcy, without relating it to profitability, liquidity and solvency. The initiator of the study of failure as a process, Argenti, took the profitability, liquidity and solvency contained in different failure process and associated them with nonfinancial causes of company bankruptcy.

Argenti (1976:153-163) identified the types of business failure as a process and called them trajectories. Hlahla (2010:7) refers to the trajectories as paths taken by companies that commonly fail. The trajectories and the symptoms of each individual

type, namely the first trajectory, is the failure path of a typical starting-up company. Its flaw is unskilled management. These types of companies are newly formed and will probably fail within five years. The second trajectory is a company at its early stages. Their weakness is abrupt growth followed by a sharper drop, caused by no attention being paid to correctly managing the operational and financial side of the growth period. These types of companies are known for their “*know it all*” attitude, not open to any advice and the average time frame to collapse is 10 years. The third trajectory is a mature company. Its drawback is that the environmental transformations are not reacted upon. These types of companies have been trading successfully for decades. Approximately 20-30% of failures are due to overtrading or the launch of big projects that fail.

These trajectories have been adopted by Ooghe and De Prijcker in 2008 from the Argenti 1976 model being the failure prediction process of an unsuccessful start-up company, ambitious growth company and dazzled growth company. Ooghe and De Prijcker (2008:233-238) added a fourth type of failure process: an apathetic established company, its weakness being lack of motivation, commitment and strategic advantages by management.

2.2.3 Bankruptcies influenced by management error

Altman and Hotchkiss (2006:13) opine that the incompetence of management is the universal cause leading to a company’s possible distress or failure. Incompetence; insufficient skills; autocratic, doctoral and domineering management styles are just a few managerial problem areas companies face. Argenti (1976:1) states that company distress or bankruptcy is an unpleasant subject yet a reality that is surprisingly scarcely found in management articles, workshops or lectures. Sharma and Mahajan (1980:81) support Argenti in saying that ineffective management is a symptom of business failure and are in agreement with Altman and Hotchkiss that it is a pervasive cause of company failure due to its rippling effect ability. The performance of the company degenerates when corrective action is absent resulting from an oversight in the strategic planning or implementation caused by bad management.

Ooghe and De Prijcker (2008:227-237) applied different types of failure processors and linked them to nonfinancial causes of company bankruptcy with their variables. *“Management being the origin of most problems’ corporate policy, this is where the companies get lost, immediate environment basically the domino-effect that*

decreases a company's survival chances and the general environment being the excuse mostly used by management". There are various reason for business failure, economic factors are, however, one of the most influential or destructive factors. The Tsunami of all recent business failure was the 2007 global financial crisis (Madubeko, 2010:3-4).

2.2.4 The influence of the 2007 global financial crises on bankruptcy

Ahmed (2010:3) concludes that the 2007 global financial crisis had numerous causalities, crippling many markets and causing negative trends especially in the trade sector. The American and European governments tried to step in to bail out companies affected. Elliott (2011) reported that a G20 group (a forum formulated consisting of finance ministers and governors from the central bank of 19 global countries) was formed to attempt to prevent the inevitable global recession from turning into a total collapse. Part of their rescue plan was to give global fiscal stimulus packages to affected countries. South Africa (SA) was not hit so hard by the crisis due to the strict financial regulations that came into effect 1 June 2007, namely The National Credit Act (34 of 2005). This act's objective was to protect consumers by preventing them from willy-nilly applying for credit and just receiving it. So when the market might go into a downward spiral, debt will still be repayable as one of The National Credit Act (34 of 2005) goals is to disallow unfair, irresponsible and reckless credit and credit granting that could lead to company failure.

Deakin (1972:167) posits company failure is an event which can produce substantial losses for creditors. Ahmad (2010:1) adds that company failure can also create losses to the development of an economy and society, stakeholders, labour unions, employees, customers and suppliers. Bankruptcy is not limited to individuals and companies. It also affects governments. Greece dropped their single currency, the drachma, and shouldered the euro. This adoption took place on the 1 January 2002 and the transition period was 1 year (European commission, 2009). Elliott (2011) reported that the analysts were sceptical about the transition. They feared suffering losses as a result of moving from a single currency. Greece's debt increased significantly from €168 billion to €262 billion in 2004. According to Ahmad (2010:5-6), early-warning systems could reduce the probability of corporate distress or even bankruptcy.

2.3 BANKRUPTCY PREDICTION MODELS

According to Mossman *et al.* (1998:36–37), there are four types of bankruptcy prediction models that contain descriptive or predictive abilities. Altman and Hotchkiss (2006:251) refer to these models as different, but restrictive. The four models are the financial ratio models, cash flow models, return variation models and a variance of return variables model. Mossman *et al.* (1998:36–37) further explains that the ratio model is most effective in explaining a bankruptcy likelihood the year prior to bankruptcy and the cash flow model consistently discriminates between bankrupt and non-bankrupt companies from two to three years prior to bankruptcy. The results further indicated all the models to be statistically important one year prior to bankruptcy. Altman and Hotchkiss (2006:251) stated “*none of the models may be excluded without a loss in explanatory power*”. Financial ratio models’ groundwork was based solely on financial ratios. Fitzpatrick (1931:1-132) investigated whether a trend difference existed between failed and non-failed companies by applying financial ratios in 1932 to determine if the same financial ratios that were successful in the non-failed companies are unsuccessful in the failed companies (Yadav, 1986:13).

2.3.1 Financial Ratio Model

Collins (1980:52) accentuates that the financial deterioration of a company takes place over time because bankruptcy does not transpire at a certain point in time; therefore he refers to this model as an appealing model. In the seminal studies conducted by the likes of Beaver (1966) and Altman (1968), Blum (1974) found that the ratio model delivered significant results. Other disciplines found financial ratios to be useful when evaluating a company’s going concern for company valuation purposes (Mossman *et al.*, 1998:36). Du Jardin (2009:5) argues that Back *et al.* (1994) constructed a model with only common variables, yet it does not perform as well as models constructed with only financial ratios. Furthermore, Mossman *et al.* (1998:52) found ratio-based models provides more positive outcomes than the financial base variables model with only common variables, yet it does not perform as well as models constructed with only financial ratios. Mossman *et al.* (1998:37) opine even though this model has been applied with favourable outcomes and yet no agreement exists as to which financial ratio can be prescribed as the best predictor of bankruptcy. Altman Z-score (1968) and Zeta (1977) models have been referred to as

the eminent models globally (Eidleman, 1995:52-53). Rama (2012:38) and Mossman *et al.* (1998:37) argue that in spite of this no dominant ratio model has surfaced in South Africa.

2.3.2 Cash Flow Model

Aziz, Emanuel and Lawson (1988) developed the first cash flow model of bankruptcy. Lawson (1995:162) states that sources of funds are equal to the application of a fund in that sources of funds originate from a company's operational activities, assets sold, loans raised and shares issued. Application of funds are the assets obtained, tax payments, repayment of loans and dividend payment. This flow of funds gives an incorrect impression that the funds from operations form part of the reserves that can be used with the judgment of management. This perception could be rectified by re-organizing and reclassifying information contained in this flow of funds statement. This change could enable users to identify the source of funds and how they are produced. This statement being the cash flow of the entity equals lenders' cash flow plus cash flow of shareholders.

Bankruptcy is triggered when a company is unable to repay its debt due to inadequate cash and can no longer acquire any additional financing (Mossman *et al.*, 1998:37). Cassey and Bartczak (1985:384) state a company has a better chance to survive detrimental changes the greater its net cash flow from operations is. This model is based on the fundamental finance principle being that the value of a company is evenly matched to the net present value of its expected future cash flows. The tax on cash flow can also be utilized as an indication whether a company is financially fit or not. A financially fit company will be taxed on its income and a financially unfit company will not have income to tax (Mossman *et al.*, 1998:37).

Slotemaker (2008:18) agreed with Aziz *et al.* (1988:419-437) that the work of Beaver (1966), Edmister (1972) and Altman (1968) was not based on solid theory work. Therefore they found fault with their bankruptcy prediction models because they were based around ratios. The fact that cash flows are closely connected to company valuations supported their belief that the cash flow model was a better predictor of company failure than the ratio based model.

Aziz *et al.* (1988:419-437) tested their model and compared it to that of the Altman's Z-score and Zeta models and concluded:

- Results were favourable in comparison with the Altman's models.
- The accuracy was found to be roughly identical.
- The cash flow based model can probably predict bankruptcy up to five years and indicate early warning signs up to three or more years before it happens.
- In the period immediately before bankruptcy the Zeta and Z-score models have a higher ranking.

Slotemaker (2008:19) found that Viscione (1985) and Watson (1996) concurred that the cash flow from operations' information was deceptive; it is open to manipulation of the cash flows and the timing thereof by management. The cash flow information does not give added information over and above that of the accounting information that can differentiate between bankrupt and non-bankrupt companies.

2.3.3 Return and Return Variation Model

Beaver (1966:85) ranked the failure predicting ability ratios from the strongest to the least strong. He found that equity returns (cash flow/total debt and total debt /total assets) to be stronger predictors of failure than the liquidity ratios. Prior studies by Clark and Weinstein (1983:504-509) established when a company files for bankruptcy, it is possible that its share market risk can be negatively adjusted and the shareholder's gains are then at the mercies of the courts. The month in which the bankruptcy was declared, the studies have revealed that shareholders experience escalating losses, and this is in concurrence with similar earlier studies conducted. The declaration is actually the primary element of information released to the market. The findings of the research released that at least three years before bankruptcy, negative market returns appear.

Studies according to Chava and Purnanandam (cited by Malik 2013:82) found that there is a positive relationship between financial distress and expected market returns. Mossman *et al.* (1998:38) added that studies conducted by Aharony, Jones and Swary (1980) utilizing a prediction model based on the market return variances have demonstrated that four years before bankruptcy, it has officially been announced that there is a difference in the behaviour of the variances in returns, as bankruptcy approaches the unpredictability of company returns' increases. Beaver (1966:100) expressed the market rate of returns reveals information that includes

accounting and other relevant data required by investors and the market rate of return therefore results in a robust test. However Blum (1974:14) views that the market does not necessarily know the timing of company failure.

2.3.4 Variance of Return Variables Model

Empirical models have the ability to discriminate between bankrupt and non-bankrupt companies before the event occurs. However, these models are all prone to predict bankruptcy. To determine whether the classification is correct, the accounting and financial variables will be examined. Value is provided to practitioners when the models are predicted from the sample, in the following order: Initially make an effective distinction between failure and non-failure in the selected sample. Subsequently examine each models' power to discriminate and in the case of external factors overlapping with the original research data set, the knowhow of external predictive ability is crucial (Mossman *et al.*, 1998:38).

Hlahla (2010:8) points out that a weak strategic positioning is evident through different financial ratios, namely poor sales, poor profitability, poor cash flow and poor liquidity. This can be achieved through courses of action being put into place, appropriate planning and allocating resources wisely. However, putting financial ratios in place on their own will not overcome the problem. The managers in key positions need to have the ability to interpret the ratio that has been put in place in order for the ratios to be effective.

2.4 DEVELOPMENT OF FINANCIAL RATIOS AND FAILURE PREDICTION MODELS

2.4.1 Background

Financial ratios have been around since 33 B.C. Brady (1999:5) explains that approximately 300BC Euclids, a Greek mathematician, organized and applied logic to geometry in a book he wrote: Book V of his elements, this was the origin of financial ratio analysis. Ratio is a Latin term meaning reckoning, calculation and reason (Smith, 1925:478). Ratio is the relationship between two groups or amounts (Cambridge advanced learner's dictionary, 2010:1177). Lev (1974:11) points out a ratio measures numerical relations, fractions that contain a numerator and denominator and an outcome is achieved by dividing the numerator by the

denominator. According to Beaver (1966:71), a financial ratio is a percentage of two numbers that both involve financial statement elements. Horrigan (1968:284) posits that it is safe to say that everything that has virtually been started in ratio analysis is still going on somewhere.

Horrigan (1968:285-290) discusses the timeline of financial ratio analysis developments as from 1890 to 1968. The financial information and flow of information vastly increased in the 1890s. The evolution of financial statement analysis by creditors was in the following sequence item comparison, analysis on columnar basis, partition was made between current and non-current items and relationships in the financial statement started appearing between different items. On this progress the current ratio was developed. Foulke (1961:178) stated ratio that evolved in the late 1890s, for instance the current asset ratio (current assets / current liabilities) had very meaningful and enduring impact on financial statement analysis, while other ratios developed during the same time period did not have the same long-lasting effects. Ratio analysis became essential in the 19th century.

Brown (1955:13) points out the America's drive to industrial maturity in the last half of the 19th century brought about the necessity of ratio analysis. The refined increase of the capital markets and the information gush led to an overwhelming need for financial statements by stakeholders namely: creditors, investors and management. An overlapping of credit and managerial purposes occurred during the transfer of management from enterprising capitalist to professional manager, as the purpose for managerial control increased greatly. The credit purposes measure the ability to pay and managerial importance is placed on measuring profitability. Both routes were taken and their components were borrowed from each other.

Ratio analysis evolved before and during world war one (Horrigan, 1968:185). These developments consisted of three internal factors and two external factors. These factors increased the demand for financial ratio analysis and have been stated in the following sequence. Internal factors were a formulation of a large number of ratios, the renowned ratio criteria appeared being the 2 to 1 current ratio criteria. The external factors are the implementation of the Federal Income Tax Code of 1913 and the Federal Reserve System of 1914. Brady (1999:11) points out analysts acknowledged the importance for analysis and the need for ratio criteria. Regardless

of these developments, not many analysts used the ratios and if they did, they would mostly use the current ratio.

Wall (1919:229-243) conducted a study known as the study of barometrics. This study undoubtedly put him on the map as the pioneer of ratio works moving from use of a single ratio to multiple (seven different) ratios in 1919. Critics believed this method was complex, factors were not consistent and vital financial statement data was strenuous to obtain and in spite of the criticism Wall's study was deemed to be revolutionary (Brady, 1999:12).

In the same era, Du Pont (1961:5) a chemical company in the United States of America (USA) started using the ratio triangle pyramid system. According to Sloan (1963:140), it is the first documented framework system. Brigham and Ehrhardt (2007:464) state that the Du Pont system shows how in determination of the rate of return on equity, the profit margin on sale, asset turnover ratio and the use of debt interact. Furthermore, Sloan (1963:140) states he has no experience of any financial principle that better represents the rate of return as an unbiased assistance to business judgement.

Bliss (1923:34-38) was a firm believer that ratio was a fundamental measure of a business enterprise. Gilman (1925:111-112), a ratio analysis critic, condemned the accounting data limitation, the source from which financial ratio analyses are computed. He disagreed with the reliability of this type of analysis, due to the diversity of the indicator between ratios. He states numerator and denominator variations disable interpretation because of change in time, making the measurement thereof synthetic and redirects analysts' deliberations from a holistic outlook of the company. It can therefore not be said that the relationship between businesses is illustrated by financial ratio. He then introduces the trend percentage analysis as a substitution for the use of the ratio analysis.

Foulke (1961:176-229) being a Dun and Bradstreet employee in the 1930s enabled him to secure industry data for a group of 14 ratios, these ratios were compiled by Foulke and his employers. These ratios became well-known and extremely influential industry average ratios. The criteria of these ratios' legitimacy were based on the years of experience. Winakor and Smith (cited by Brady, 1999:15) used twenty-one ratios to scrutinize the trends of the prior ten years. They concluded working capital to total assets being by far the most accurate and steady failure indicator.

Fitzpatrick (1931:1-132) conducted a comparative analysis using 13 ratios. His sample consisted of 20 failed with 19 non-failed companies and his period of study was 1920-1929. The conclusion his studies reached is that all ratios had the ability to predict failure to some degree; however, commonly the best indicators were the net profit to net worth (Return on equity ratio), net worth to debt (Debt to equity ratio) and net worth to fixed assets (Fixed asset ratio).

Ramser and Foster (cited by Yadav, 1986:15) used 11 types of ratios on 173 companies; the failed companies were lower than non-failed companies. Merwin (1942:134-139) followed by dissecting an unspecified number of ratios for the trend of the previous six years on failed and non-failed companies. He identified three ratios as predictors of failure, classified as net working capital to total assets, net worth to debt and current ratio. Beaver (1966:76-101) conducted a direct study of the predictive power of ratios. Both studies conducted by Beaver (1966) and Merwin (1942) were able to predict company failure up to five years, however the statistical techniques result of Beaver's (1966) study was more powerful.

During the Second World War (1940–1945) ratios were still being used and during this time the crux of the matter was not the ratio itself, but the behaviour of the ratio over time (Horriggan, 1968:289-290). The return on investment ratio was examined in the 1950s and caused a commotion as this ratio could be used for the purpose of managerial analysis. This period brought into consideration the different accounting procedures' effects on ratios, example FIFO vs. LIFO, and the ratios pretending to measure the same thing, their behaviours (Brady, 1999:16).

2.4.2 Present day

The foundation of this period was the studies of quantitative methods, empirical research and statistical analysis (Brady, 1999:17). Edmister (1972:1477-1478) stated there was much of company failure prediction research done, but seminal studies were done by pioneers of the field of study. The studies cover the period 1954 to 1968 and they all used the one-to-one match, otherwise known as the pairing approach. These pioneers in the field would compare financial statements of failed companies to those of non-failed companies' financial statements (Hlahla, 2010:17). The pioneers referred to were RO Edmister a Professor of finance at the University of Mississippi, El Altman a Professor of finance at the Stern School of

Business since 1977, Dr WH Beaver a professor at the Stanford University and M Blum a CEO at Gordon Feinblatt. Their period of study ranged from 1946 to 1969.

Previous studies have shown that different financial ratios have been used for different reasons. According to Bary (2003:17-18), the cash ratio (Total cash/Total assets) is important in measuring a company's financial performance and it is not a depreciable asset, making it an exceptional way to compare earning over long periods of time. Wiersema (1998:40-42) posits inventory turnover is important (Cost of goods sold/Average inventory), suggesting a high inventory ratio indicates high cash flow in turn indicates that the business is thriving.

The views of Trevino and Robertson (2002:83-84) put forward, emphasize the importance of the price earnings (PE) ratio (Share price/Average net income). They say this will indicate the eagerness of investors or potential investors to invest on determining whether a relationship exists between P/E ratio and subsequent holding period of returns. The researcher has found the PE ratio not being of much help when predicting short term returns. In addition, in estimating long term average returns the current P/E ratio is useful. Even so the investors will not be capable of timing the market if the current PE ratio is isolated. Investors should, when the current P/E ratio is high, anticipate lower returns and when low, anticipate high returns.

The receipt of a lower return when the P/E is high, is likely a display of the risk/return trade-off and not consequences of an over-valuation or inefficient market. Furthermore, the findings point out in agreement with the theory that when current interest rates are low, current P/E is inclined to be high and the market premiums low. Trevino and Robertson (2002:84) continue by saying it will be a mistake not to invest in shares when the P/E ratio is high. Although the returns are lower, they still need to be higher than the Government Bond and Promissory Notes, and financial advisors should not use current P/E ratio to predict short term returns. Assuming a high P/E ratio is equal to the low long term average and vice versa, bearing in mind the standard errors that are linked to forecasting the expected returns that are conditional, average returns are compared to average returns over long term.

Arnott and Asness (2003:70-84) argue that the pay-out ratio (Total dividends/Net income) encourages the willingness to invest. Even though equities are not and have not been cheap, their recommendation is in favour of acquiring equities. The

intension of the study was to demonstrate that low pay-out ratios are strong positive signs for future growth; regrettably Arnett and Asness's (2003:84) views were in contradiction to the historical evidence. However, it was concluded that a low pay-out ratio ushers a low earning growth.

Empirical studies have found a large portion of earnings will be paid out when managers are in the possession of private information. Information boosts management's confidence level making them feel it is unnecessary to have dividend cuts, and smaller portions are paid out when they are not so confident. Assumptions are made by Arnett and Asness (2003: 84) that low pay-out ratio leads to less ideal projects due to poor growth. On the other hand, high pay-out ratio suggests a more cautiously chosen project. Chen and Shimerda (1981:51) posit diverse ratios are often embraced by different researchers. With the use of financial ratios there is one recurring question: *"which ratios among the hundreds that can be computed from available financial information, should be analysed to obtain the information for the task at hand?"*

Ratios have been adopted as a financial ratio analysis tool. Besides the ratio analysis, financial statement analysis has other analytical techniques, namely: comparative financial statements analysis, trend analysis, index analysis and common size analysis (Correia *et al.*, 2011:5.9). Kennedy and McMullen (1973:297), in agreement with Ebelthite (1998) and Gouws and Lucouw (1999:102), stated ratios are only estimates, not exact indicators, because a single ratio by itself is futile as it is only data instead of information and it does not give a holistic picture.

Ratios only become significant when they are attached to yardsticks to compare. Furthermore they do not replace the thinking process of an analyst, hence: if there are any changes, ratios need to be interpreted in light of the changes in the items that make up the ratio. Brigham and Ehrhardt (2007:462) are of the view that analysts should practise good judgment and intelligence and look beyond the numbers when conducting the analysis.

Ratio analysis has its problems and adjustments need to be made accordingly. Tuvadaratragool (2013:35) states the source of data used in the calculation of ratio analysis is acquired from financial statement items which are the statement of financial position (SOFP), statements of comprehensive income (SOCI), the statement of changes in equity (SOCIE) and the statement of cash flows (SOCF).

According to Brigham and Ehrhardt (2007:439), some people view financial statements as just accounting, but they are really much more: they furnish an abundance of information to vast numbers of stakeholders. One reason to analyse financial statements is to highlight the strengths and shortcomings of a company. These ratios are also accompanied by limitations and are effected by non-numerical factors. Brigham and Ehrhardt (2007:461-462) aptly sum up the limitations as follows:

Yardsticks used by companies are above average because companies benchmark themselves against the industry leaders. The aim of doing this is that companies want to stay in the game and therefore their goal is to be above average. This is to level the playing field. Ratio analysis is more effective in smaller companies, as they don't consist of a diverse number of departments or divisions resulting in difficulty to set relevant industry averages. Judgment needs to be used when interpreting comparisons between different companies due to inflation.

Service (2013:1067) agrees that inflation has an effect on the true values' meaning that the recorded values on the statement of financial position may have been misrepresented. Sectional and abnormal factors can also distort ratio analysis. In such a case, the use of monthly figures will be more appropriate. Companies manipulate their financial statements to look stronger than what they really are. This technique is referred to as "*window dressing*." Distortion can be created by different accounting practices of different companies, for example the valuation methods of inventory and depreciation. It is difficult to say as a rule whether a ratio is good or bad. Different ratios can indicate different outcomes. For instance, having excessive cash is bad. This excessive cash could be a result of a high current ratio that indicates a strong liquidity which is good; the effects of the same ratio could have different outcomes.

Furthermore Brigham and Ehrhardt (2007:463-464) went on to mention the non-numerical factors that could have an effect on the financial statement and consequently affect the ratio analysis namely: the increase in competition in the industry could decrease prices and profits, legal and regulatory environment, changes in laws and statues may have implications on the industry. Target markets aimed at one key type of customer: customers might go elsewhere. Distinct products result in lack of variety: the effects of a drop in demand. A single supplier might create unexpected shortages leading to lower profits and having a substantial foreign

clientele will have effects of currency fluctuation, political stability and additional market risk (Brigham & Ehrhardt, 2007:463-464) Kennedy and McMullen (1973:297) opine ratio analyses are more relevant when ratios are being compared against some or other standard. These standards vary from prior experience or judgment, past financial records and operational performances, the most successful companies in the industry, current budget data and the market the company trades in.

Lev (1974:11) accentuates that ratio analysis is merely a mechanical operation where one figure is expressed in terms of another figure in order to reduce big numbers into smaller indicators. A ratio analysis in itself does not provide any answers (Brady, 1999:7). Knowledge is obtained when financial figures are interpreted. Gouws and Lucouw (1999:107) explain that ratio analysis is only a tool to assist interpretation.

2.5 DEVELOPMENT OF DIFFERENT MODELS USING FINANCIAL RATIOS IN ANALYSING COMPANIES' FINANCIAL DISTRESS

Altman and Hotchkiss (2006:238) proposed *“the detection of company operating and financial difficulties is a subject that has been amenable to analysis with financial ratios”*. Research conducted on assessing the techniques on assessing the distress risk can be split into pre and post 1990s. The former was controlled by a single-period model. The aim of this model was to discover unique characteristics that are in contrast between distress and non-distressed companies. The period post 1990's and the scrutiny of the model during the pre-1990 have created a necessity to determine a company's distress at different time periods (Outecheva, 2007:87).

2.5.1 Credit Scoring Models / Distress Risk Techniques

The necessity of a credit risk model was influenced by two recent important circumstances. In Basel Accord II the capital requirements were recommended on credit assets and the massive amount of defaults and bankruptcies in the United States of America (USA). McCormac (2004:1) defines The Basel II Accord *“as a document that outlines the minimum capital requirements to which all large, internationally active banks in the G10 countries must adhere”*. Investopedia (2014) describes it as *“a set of banking regulations put forth by the Basel Committee on Bank Supervision, which regulates finance and banking internationally. Basel II attempts to integrate Basel capital standards with national regulations, by setting the*

minimum capital requirements of financial institutions with the goal of ensuring institution liquidity”.

Altman and Hotchkiss (2006:234) have compiled an evolution list of corporate credit scoring techniques which include: qualitative subjective models, univariate and multivariate analysis. There is the linear quadratic model which consists of the discriminant and logit probit models. There is the non-linear quadratics which is the recursive participating analysis and the neural networks. The (EMS) is the Emerging Markets Score, the artificial intelligence systems, the option or contingent claims models and blended ratio or market value models. The following models accounting base, market base, hazard and statistical model will be looked at and a brief description will be given. The objective of these models is to predict failure or financial distress. The difference is the manner in which it is done. All these models are based on financial ratios, the hazard and statistical models only apply to certain financial ratios, due to the nature of data that lead to not all the financial ratios being statistically important (Shumway, 2001:102). The source of the accounting based model is financial statement representing book values.

2.5.2 Accounting Based Models

In order to predict financial distress when using the accounting-based model, calculation of profitability, liquidity and solvency ratios need to be done using financial data. Dichotomous variable is used to measure distress risk in traditional accounting models to classify a company as either financially fit or unfit. When using financial data, the following factors need to be taken into consideration. The financial data is obtained from financial statements that are subjective to the preparers of the financial statements judgement and might possibly be manipulated by management. Comparing companies in the same industry could be difficult, due to the difference in a company's structure and accounting policies (Correia *et al.*, 2011:5.9).

Financial statement data is based on historical information and inflation is not taken into account as it results in distorted figures. These financial statements namely Statement of financial position (SOFP) and Statement of comprehensive income (SOCI) cannot make any assumptions regarding the future market forces. They only indicate a company's state of affairs at a certain point in time of the past operating activities (Vigario, 2008:214). Brigham and Ehrhardt (2007:440) describe the foundation of this technique as the computation of a single financial ratio or a number

of ratios that are then compared to a benchmark. The usefulness of information in financial statements is tested by this model (Outecheva, 2007:88). The market-based value source is market values.

2.5.3 Market Based Models

Merton (cited by Outecheva, 2007:95) introduced the first market-based model in 1974. A market-based model has since become a sought after model among investors. This model brings under control the obstacles inherent in the accounting-based model. This is achieved as it combines the company's liability structure with market prices of assets in the attempt of forecasting distress risk. The market-based model's core assumption is that market values contain all necessary information relevant for the capital providers to compute the possibility of default (Outecheva, 2007:94–95). The hazard model follows on the same variable as the above model over a period of time.

2.5.4 Hazard Model

Shumway (2001:101) points out that research on forecasting bankruptcy has been conducted over decades by economists, academics and accountants. The accounting and market based models were used to predict failure over single periods. Shumway (2001:101) purports that a single period model uses multiple period bankruptcy as bankruptcy is of such a nature that it occurs over a period of time and is a static model. Furthermore, this model's prediction probabilities are inconsistent and biased as it ignores certain important facts in particular that company's change over time, resulting in incorrect opinions being formed. Shumway (2001:101-111) is in favour of the Hazard model, stating it is a more appropriate model for predicting bankruptcy, as it utilizes all available information and does not disregard changes over time generating stable forecast. Even so, it is not clear whether all the variables relating to this model are significant. The statistical model applies statistical tools commonly known as means, median and mode.

2.5.5 Statistical Models

Back *et al.* (1996:1) informs that research for failure prediction originated with Fitzpatrick (1931). He compared failed to non-failed companies, used financial ratios during a period when researchers were without the now available technology and

statistical methods that refine failure prediction accuracy. Tuvadaratragool (2013:37-38) explains that Fitzpatrick used the trend percentage of certain financial statement items, for instance receivables, inventory, net worth and total debt and ratio comparison techniques. He proposed that these techniques can be used for failure prediction and as a tool to assist in identifying corporate failure symptoms. The ratios he found to have failure prediction ability being Return on Equity (Net profit/Net worth): the amount a companies make from their investments; Debt to Equity (Debt/Net worth) compares the total amount owed to owned and Fixed Asset ratio (Fixed asset/Net worth) an indication of the company's financial strength as noted above. These three ratios were a cut above the rest (Brady, 1999:15). Prediction studies have substantially grown to date as it has been a daunting task in the accounting discipline since the 1930s and it has been demonstrated through the studies of Ramser and Foster (1931), Winakor and Smith (1935) and Merwin (1942) (Back *et al.*,1996:5)

Altman and Narayana (1996:81) posit Tamari (1964) was the first academic to try a modern statistical failure analysis. Beaver, the founding father of the univariate approach, successfully applied the first statistical analysis in (1966) and this application changed the traditional research and laid the foundation for other analysis namely the multivariate discriminant analysis (MDA) of which Altman (1968) was the architect of. This multivariate techniques was dominantly used in failure prediction models till the 1980's and not being without criticism from the scholars in the field. Laitinen and Kahkaanpaa (1999:67-68) divides statistical studies conducted into three clusters. First cluster is when the theoretical part of the failure process is studied, next cluster when non-financial variables are included in the study with the aim to explore the pre-eminent failure prediction variables empirically. Finally the last cluster study determines the most predominant prediction model and it attracts new methods unlike as in cluster one and two. Table 2.1 below will illustrate the three levels of studies, instruments used researchers that conducted studies and the period studies that were conducted.

Table 2.1: Cluster of level of studies

Clusters		Ground of study	Instrument	Researchers	Year
1	Theoretical	Theory regarding the failure process	Theory based	Wilcox	1971
				Santomero & Vinso	1977
2	Empirical	Determine best financial variables	Ratios : Liquidity, Solvency, Profitability, Asset management	Merisah	1983
				Casey & Bartczak	1985
				Gentry <i>et al.</i>	1987
3	Empirical	Identify most effective model	Including non - financial variables	Peel <i>et al.</i>	1986
				Keasey & Watson	1987
				Betts & Belhoul	1987

Source: Adopted from Laitinen and Kahkaanpaa (1999:67-68)

From Table 2.1 above it is evident that there are different stages of statistical studies: firstly theory which will also be applied in the present study, followed by the measuring of both the financial and non-financial variables. Lastly, cluster three will also be applied in the current empirical study without applying new methods, but rather identifying the effectiveness of existing models.

As the need for failure prediction research grew, new approaches emerged in this growing process. These new approaches have been implemented in the attempt to increase the failure prediction level of accuracy by introducing and combining it with statistics. During the 1960s univariate and Multiple Discriminant Analysis (MDA) were developed, in the 1980s the Logit replaced the MDA and by the late 1980's the Recursive Partitioning (RPA) and Survival Analysis came into play. These models are not as sought after as the MDA and Logit. In due course, the Neural Network (NN) was introduced to predict failure. Leshno and Spector (1996) and Laitinen and Kankaanpaa (1999:82-83) agree the NN has a better accuracy rate than the MDA. Despite this, Edmister (1972), Deakin(1972), Ooghe and Spaeniers (2010) opine that the MDA is the easiest and most used technique (Rama, 2012:11).

The major features of the popular statistical techniques used in prior studies have been illustrated and summarized in Table 2.2 This table has been adopted by Tuvadaratragool (2013:49) and Laitinen and Kankaanpaa (1999:67-68) and adjusted for the purpose of this study. Table 2.2 indicates the various available statistical models for period 1932 – 2007

Table 2.2: Statistical studies comparisons and key features

Model Type	Features	Author	Date
Univariate	Analysis of the factors is done on a one by one basis. The presentation of the financial ratio variables in using this analysis is deceptive. Even so it does have the ability to predict failure (Altman & Hotchkiss, 2006:239).	Fitzpatrick	1932
		Merwin	1942
		Walter	1957
		Beaver	1966
Multiple Discriminant Analysis	This analysis finds the best combination that can predict the difference between the classified groups. The MDA is mainly used to predict when problems consist of independent variables that are in qualitative form (failed or non-failed). Blum (1974) found that this model could predict failure accurately in the first year up to roughly 93 to 95%.	Altman	1968
		Edmister	1972
		Deakin	1972
		Blum	1974
		Moyer	1977
		Altman, Halderman & Naarayanan	1977
		Altman	1983
		Booth	1983
		Rose & Giroux	1984
		Casey & Bartczak	1985
		Lawrence & Bear	1986
		Poston, Harmon & Gramlich	1994
		Grice & Ingram	2001
		Bei & Liu	2005
		Hossari	2007
Logit	This analysis makes use of a score to determine probability of failure. The score is created for the firms by weighting the independent variables. Back, Laitinen and Sere (1996) found that the logit analysis performed better than the MDA analysis three years before failure.	Ohlson	1980
		Gentry, Newbold & Whitford	1985
		Ugurlu & Aksoy	2006
		Chi & Tang	2006
		He & Kamath	2006
Recursive Partitioning (RPA)	This analysis is in the form of a tree and is known as a classification tree. The original sample is placed at the top of the tree and split into subsamples. The sample is then split further. This process is repeated until it is impossible to split it further.	Frydman <i>et al.</i>	1985
		Tam & Kiang	1992
Survival Analysis	Determines the time frame before an event occurs. It consists of two ideas, risk and hazard rate. Risk is a set of individuals that run the risk of events occurring at a certain point. Hazard rate also known as the failure rate: it is expected that an event will occur at a certain time to a certain individual who is at risk at that time (Allison, 1984:16).	Lane <i>et al.</i>	1986
		Luoma & Laitinen	1991
Neural Network	Computerized structured three layered neurons that are interconnected. The neurons	Tam & Kiang	1990 + 1992
		Coats & Fant	1993

Model Type	Features	Author	Date
Analysis (NN)	consist of input, output and connections between the layers. Certain layers can be connected, but not with the same growth in the same layer. When information flows in one direction between layers it is called a feed forward net.	Fletcher & Goss	1993
		Wilson & Sharda	1994
Human Information Processing (HIP)	Researching the decision-makers' behavior. Decision-makers use accounting information as indicators. Nevertheless the accounting information must be understood and evaluated in order to enhance the decision-making process (Belkaoui, 1990:XI).	Libby	1975
		Casey	1980
		Kida	1980
		Zimmer	1980

Source: Tuvadaratragool (2013:49) and Laitinen and Kankaanpaa (1999:67-68), adjusted

Table 2.2 above clarifies several studies within the literature suggests many different models, some being of statistical nature. It has also been indicated that various authors' model preferences differ. For instance, the logit model is found to be a recommended model, yet the MDA is seen as a better model performer subsequent to failure.

2.5.6 Conclusion

The foundation of the accounting base model is different financial ratios and the market base model integrates company's liabilities with their assets at market value when forecasting distress risk and is preferred by investors. The hazard model predicts failure using multiple periods and statistical models are models usually associated with technology such as computer programmes. These models are prominent among prior studies the statistical univariate analysis developed by Beaver in 1966, the statistical MDA analysis established by Altman in 1968 and both these models are accounting based. These models utilized the hazard model as the period of their studies was over multiple periods, not over a single period. This research is based on the combination of the accounting, hazard and statistical models consisting of the univariate employing trend and comparative financial ratio analysis and the MDA applied to the Emerging Market Score (EMS).

2.6 PREVIOUS STUDIES

Over the years, various studies were conducted that lead to the progress of failure prediction model building, leading to accurate prediction of a company's failure and success rate. The following is the most prominent, conducted by developers Beaver

(1966), Altman (1968), Blum (1974) and Edmister (1972). Blum (1974:84) explains the failing company doctrine also evolved with the aim of curbing the companies from making fake valuations with the intention to lower the financially distressed company's value. Berry (2000:5) states salvaging a company whereby artificial assessments were conducted is to the disadvantage of the stakeholders.

2.6.1 Beaver's Model (1966)

Beaver (1966) conducted a seminal study based on financial ratios (Slotemaker, 2008:19). Ahmad (2010:7) states that the development of bankruptcy predictions started with Beaver in 1966. Sharma and Mahajan (1980:84) are of the opinion that all other research done was merely just an extension of Beaver's work. Beaver (1966:71) defines failure as *"the inability of a company to pay its financial obligations as they mature. Operationally, a company is said to have failed when any of the following events have occurred: bankruptcy, bond default, overdrawn bank account or non-payment of a preferred stock dividend"*. This seminal study was designed as a yardstick enabling future investigations into alternative failure predictions (Beaver, 1966:72).

Altman and Hotchkiss (2006:238) referred to Beaver's work as classic in the area of ratio analysis and bankruptcy predictions. Beaver applied the univariate analysis (determining whether single financial ratios have the capacity to predict failure) and conducted dichotomous classification tests to forecast whether a company is financially fit or not and for a period of five years prior to failure. In his study Beaver experiences some difficulty in the data collection of the failed companies.

Beaver's (1966:100) focus was to probe the prediction ability of financial ratios and not to discover the best failure predictors. The period of his study was 1954–1964. The sample selected was 79 failed and 79 non-failed companies that operated in 38 industries and used 30 financial ratios. The sample selection criteria for companies, was listed on the Moody's Industrial Manual Manufacturing companies, industry and asset size (\$.6million to \$45 million). The data collected (financial statements) obtained for five years before failure. A selection criterion for ratio selection was frequency appearance which is the popularity, the ratio performance in prior studies and the ratios used within cash flow structure.

Beaver (1966:80) explained a comparison between the cash flow and ratio, using a reservoir as a comparison. The cash flow is seen as a reservoir that is filled up by inflows and emptied by outflows.

Considerable probability of failure:

- Substantial debt and operations fund expenditure held.

Failure is trivial

- An extensive reservoir and operation net liquid asset flow (cash flow)

As long as the reservoir is full the company is solvent. When the reservoir is empty, a company is then deemed to be bankrupt (Sharma & Mahajan, 1980:84).

Beaver (1966:85) classified his analysis of evidence in the following manner as ratios are not able to predict failure on the same level. He categorized from strongest predictor of failure to least strong. Strongest the cash flow/total debt, net income/total assets, total debt/total asset and the liquid assets ratios performed were the least well. Bellovary *et al.* (2007:2) opinion was the consequences of Beaver's univariate studies which laid the foundation for multivariate bankruptcy prediction studies. Beaver (1966:91-100) believes a more fitting conclusion will be drawn when using a multi-ratio analysis, rather than the use of a single ratio analysis. His findings were that the forecasting ability of the financial ratios is not evenly matched and that the financial ratio analysis can be used to predict failure for up to five years before its occurrence.

2.6.2 Altman's Model (1968)

Altman's (1968:589) focus for conducting this study to "*assess the quality of ratio analysis as an analytical technique*" The reason for the study is the academics/scholars in the field pouncing on the relevance of financial ratios. They questioned whether the gap between traditional and statistical techniques could be closed, bearing in mind that the statistical techniques are recent, popular and more precise.

Altman chose the Multiple Discriminant Analysis (MDA) as statistical technique. It statistically groups companies as either failed or non-failed. This type of analysis has been used in other disciplines, namely in behavioural sciences and biology for the

first time in the 1930s. Altman (1968:591) applied the MDA in order to obtain a linear combination to discriminate best between failed and non-failed groups. Altman and Hotchkiss (2006:239) *“This technique has the advantage of considering an entire profile of characteristics common to the relevant companies, as well as the interaction of these properties.”*

Z-score model was developed by Altman (1968) who later enhanced the model to Zeta model in 1977 and modified the Zeta into the Emerging Market Score in 2006. All these models were based on ratios and consist of five variables. For the Z-score model the sample selected was 66 companies and 22 ratios were used. For each bankrupt company a matching non-bankrupt company was chosen, known as the pairing approach. The cut off period was 1946–1965. Selection criteria were based on industry and asset size (\$.7million-\$25.9 million) of manufacturing companies that have filed for bankruptcy under Chapter X of the National Bankruptcy Act. Data was collected from the same year, but the groups were not completely similar, due to industry and asset size differences. Of the 22 ratio an overall of five ratios performed the best in predicting bankruptcy holistically (Altman & Hotchkiss 2006:241). Altman (1968:604) explains that the Z-score model's accuracy deteriorates, the longer the time period before bankruptcy. In years one and two before failure, the accuracy rate dropped from 95 to 72% with a further decrease in years three and four before failure from 48 to 29% and in year five before failure the accuracy rate increase slightly to 36%. Altman (1968:604) clarifies that the reason for the fluctuation is that the Z-score model prediction ability over longer periods before bankruptcy becomes less reliable and it is a better predictor within two years before failure. Anjum (2012:212) stated that the Altman's Z-score model can be applied to the modern economy in predicting bankruptcy and distress up to three years in advance. Rama (2012:5) in agreement with Eidleman (1995:52-53) has indicated that the Altman (1968) Z-score model is globally the most reliable company failure prediction model. This model has a cut-off period which is referred to as zones. These zones make interpretation easier, depending on where the companies lie. The safe zone is when the company is not bankrupt; the distress zone is contra to the safe zone: it is when a company is identified as bankrupt. The distress zone as per Altman (1968:602) is when a company has been identified or classified as bankrupt, yet that prediction is not certain. Altman (1968:606) distinguishes cut-off periods as:

Safe zone: Z-score >2.99

Grey zone: $1.81 < Z\text{-score} < 2.99$

Distress zone: $Z\text{-score} < 1.81$

Altman (1993:203-204) modified the Z-score model to the Zeta model to enable it to be used for private and non-manufacturing companies and resulted in the variable remaining at five a change of the weighting factors and the cut-off zones. The model's variable number four's numerator was revised and changed from market value of equity to the book value of equity by Altman (1993:203-204). The cut-off zone for Zeta model

Safe zone: $Zeta > 2.90$

Grey zone: $1.23 < Zeta < 2.90$

Distress zone: $Zeta < 1.23$

Altman and Hotchkiss (2006:267-268) upgraded the Zeta model and called it the Emerging Market Score (EMS) with the aim to improve accuracy. Enron and Worldcom cases were used to test EMS and it was found that there were warning signs before the occurrence. Enron filed for bankruptcy in December 2001 and in June 2001 the (EMS) score was below the safe zone. Worldcom filed for bankruptcy mid-July 2002 and at the end of the first quarter, the EMS score was also below the safe zone. The changes to this model entail a change from five to four variables removing variable number five as indicated in Table 2.3 below. The weighting and the cut-off zone also changed.

Safe zone: $EMS > 5.85$

Grey zone: $4.15 < EMS < 5.85$

Distress zone: $EMS < 4.15$

A summary of the evolution of the revised and modified Altman Model is demonstrated in Table 2.3.

Table 2.3: The evolution of the revised and modified Altman bankruptcy prediction model

Predictor	Formula 1968: Manufacturing core industry	Measures	Explanation	Revised by Altman and Narayanan 1977: Private + non-manufacturing industry	Modified by Altman and Hotchkiss 2006: Emerging Market Score (EMS)
	$Z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.998x_5$			$Z = 0.717x_1 + 0.847x_2 + 3.107x_3 + 0.420x_4 + 0.998x_5$	$EMS = 3.25 + 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4$
X_1	$\frac{\text{Working capital}}{\text{Total assets}}$	Net liquid assets of a company in relation to the total capitalization.	If a company continually undergoes operating losses their current assets will dwindle in relation to total assets.	$\frac{\text{Working capital}}{\text{Total assets}}$	$\frac{\text{Working capital}}{\text{Total assets}}$
X_2	$\frac{\text{Retained Earnings}}{\text{Total assets}}$	Company's cumulative profitability over time.	Occurrence of failure is higher in a company's earlier years than at the latter. This analysis automatically discriminates against younger companies.	$\frac{\text{Retained Earnings}}{\text{Total assets}}$	$\frac{\text{Retained Earnings}}{\text{Total assets}}$
X_3	$\frac{\text{EBIT}}{\text{Total assets}}$	Productivity of company's asset taken before deducting interest and tax factors.	A company's assets are valued by the assets' earning power. When the assets are less than the liabilities, bankruptcy is on the horizon if it has not occurred yet. A company's existence stems from their assets' earning power.	$\frac{\text{EBIT}}{\text{Total assets}}$	$\frac{\text{EBIT}}{\text{Total assets}}$
X_4	$\frac{\text{Market Value of Equity}}{\text{Book value of Total liabilities}}$	Display how far the value of company's assets can decline before liabilities exceed assets.	The bigger the value, the bigger the degree to which assets can decline. Market value aspects are attached that other studies have ignored.	$\frac{\text{Book value of Equity}}{\text{Total liabilities}}$	$\frac{\text{Book value of Equity}}{\text{Total liabilities}}$

Predictor	Formula 1968: Manufacturing core industry	Measures	Explanation	Revised by Altman and Narayanan 1977: Private + non-manufacturing industry	Modified by Altman and Hotchkiss 2006: Emerging Market Score (EMS)
X ₅	Sales Total assets	Ability to generate sales from company's assets. How capable management is in dealing with competitive conditions.	Its unique relationship to other variables contributes to the holistic discriminating ability, because of its high ratio ranking.	Sales Total assets	
	Source: Altman (1968:594 +606)			Source: Altman (1993:203-204)	Source: Altman & Hotchkiss (2006:239-241)

Table 2.3 above indicated the advancement of the Altman model. The first model could only predict failure for large to medium listed manufacturing companies and he upgraded his model to enable it to be applied to smaller, private companies within an emerging market.

2.6.3 Blum's Model (1974)

The focus of Blum's model (1974:1) was on mergers, as company mergers repeatedly transgress antitrust laws. The construction of the model was to aid in rating the odds of company failure. This study originated from The Failing Company Doctrine and the grounds for the failing company failure predictive model was to prevent the consolidation of assets, with the aim to control competition unreasonably. Business failure is defined in accordance with the meaning courts have imputed to it in the context of this antitrust defence. Blum's (1974) model will not be dealt with further, as his study mostly concentrates on mergers and whether his model has the ability to discern between failed and non-failed companies, not predict failure. The present study focuses on bankruptcy.

2.6.4 Edmister's Model (1972)

Edmister's (1972:1477) focal point of his research was to evaluate the usefulness of financial ratio analysis in predicting small business failure. The rationale of the study is because previous studies have ignored using small business as a sample, due to difficulty in obtaining data.

Edmister (1972:1485) used two samples: a smaller sampler called the Tri-annual sample consisting of 42 companies and a larger sample referred to as a Mono-annual sample consisting of 282 companies. The reason for the two samples is that biases could have entered into the smaller sample due to screening additions. The differences between these two samples are that the tri-annual sample has more restrictions than that of the mono-annual sample. The data was obtained from the Small Business Administration and Robert Morris Associates.

When choosing the method of ratio analysis, the choice relies on the selection of the analytical methods and the ratios selected. The ratios that are grouped are more meaningful than single ratios. Some ratios boost the discriminant ability. Even then they do not have forecasting ability individually (Edmister, 1972:1490). The period of

study 1954–1969: to create a linear model the MDA method was used. 19 common ratios were examined and selected on the basis of their being found to be important company failure predictors in earlier research. Edmister (1972:1488) concludes that seven-ratio discrimination accuracy was at 93% for 39 of 42 cases.

2.6.5 The Failing Company Doctrine

This doctrine prevents assets consolidation with the aim to control competition unreasonably when a company is on the brink of disintegration or break-down and the company has no other option but a merger, acquisition or sale of a division that is running at a loss to improve companies' profitability and chances of survival. The failing company doctrine introduced by the Supreme Court in *International Shoe Co. v. FTC*, is a defence for the companies that find themselves in such an unpleasant position without still being probed by the federal court and regulatory agencies. Blum (1974:1) states a merger of competitors normally violate the antitrust laws and the Failing Company Doctrine prevents such mergers. This is done on condition that the competition does not significantly reduce or control trading within the aims of the Clayton Act. Wueller (2013:590-591) explained that, for trading to remain within the purpose of the Clayton Act, the following needs to be present: the acquired company is confronted by bankruptcy due to their assets being totally depleted or due to company failure and there is no other potential buyer.

The pairing approach has been utilized: a selection of each 115 failed companies matched with 115 non-failed companies during the cut-off period 1954–1968 using the multivariate discriminant analysis (MDA) method. Criteria of the selection is 90% of companies that filed petitions under the Federal Bankruptcy Act per industry with a minimum of \$1million in liabilities, per sales, number of employees and fiscal year "Going to the market" is when a company issues shares to the public or finance a merger. Blum (1974) believes that "going to the market" is an unusual measure of the appearance of failure and the expectancy cannot be made known precisely by the market. Sharma and Mahajan (1980:80) state that one of the causes of company failure is that management believes failure is not a slow, but an unforeseeable process.

2.6.6 South African studies

In South Africa two studies were conducted by Hlalhla (2010) and Rama (2012). Hlalhla (2010:34) used the Beaver's univariate model and Rama (2012:4) used the Altman's (1968) Z-Score model. These studies are significant as the present study uses both these models (EMS) to predict failure accurately in the South African context.

2.6.6.1 Hlalhla's Study (2010)

According to Hlalhla (2010:1-33), company failure is a problem in both developed and developing companies. Due to the difference in the market, politics, legal and accounting structures, Hlalha (2010:1) aims to investigate whether contrasting variables of a failing company in South Africa exist. The ground for this investigation is justified by the popularity of studies on failure prediction in the field, by using the pairing approach with a sample of 14 failed and non-failed companies listed on the JSE. The data was obtained from McGregor BFA and Sharenet databases. Criteria of the sample comprised of the same asset size and fiscal year and companies should be listed on the JSE.

This study excluded the financial service sector. Hlalha (2010:5) was of the opinion that this sector's failure was more predictable as it was heavily regulated. MDA method was used in addition to 64 ratios. Ratio selection was based on the level of importance identified in prior studies used by both Beaver (1966) and Altman (1968). Hlalha (2010:32) found three financial ratios to be of consequence, which was the Times Interest Earned (TIE), Cash to Debt and Working Capital. Cash to Debt is consistent with the study conducted by Beaver in 1966.

2.6.6.2 Rama's Study (2012)

Rama (2012:5-35) aimed to determine if the globally used Altman (1968) Z-score model will be workable in a South African context, as the majority of the studies have tested the model in the United States market context. This study excluded the financial service and mining sectors and the top 40 JSE listed companies. The financial and mining sectors were excluded as Rama (2012:7) opines that they are both specialised sectors and their profitability and their asset structures differ from

those of other sectors. The top 40 JSE listed companies have been excluded as it is improbable for them to be exposed to financial distress.

Test conducted on a total of 227 JSE listed companies for the period of 2008 to 2013. Data obtained from McGregor BFA data base. Rama (2012:30) applied the model in two stages. In the first stage he applied the Z-score model to determine how accurate this model can discriminate between failed and non-failed companies. It was found that this model could accurately discriminate at 91.63% that 21 companies have failed with an accuracy rate of 78.57% and 206 companies have not failed at a 93.47% rate of accuracy within a two year period (2008-2010). Secondly Rama (2012:31) applied the model with the aim to investigate further whether the model could successfully predict failure. Companies were divided into 10 deciles. The companies that fell within the 10th decile range had the lowest accuracy rate and were further split into three groups: first, second and third. The following conclusion was drawn: first group Z-score range (1.355 and 2.641) had an accuracy rate of zero, the second group consisting of Z-score range of 0.051 to 1.185 had an accuracy rate of 57.14%. Lastly the third group-score range was negative 0.03 to negative 8.649 and the accuracy rate 28.57%. The companies within the first group had positive Z-scores or fell within the safe zone (>2.99). For the companies with negative scores or that fell within the uncertainty zone (<2.99 and 1.80) namely companies within second or third group, this model is not reliable. The rationale for Rama's (2012:35) reasoning is that the accuracy levels of the companies in this range (second and third group) are much lower than the companies within the first group.

2.6.7 Concluding on previous studies

The primary difference between Beaver (1966) and Altman's (1968) study is the statistical analysis method used. Even though the period and sample size differed, Altman (1968:591-592) had a few concerns with the univariate analysis that was used by Beaver (1966). This analysis only considered the financial ratio variables one at a time in predicting failure and Altman believed when the financial ratio analysis is presented in such a manner it influences faulty interpretations because it is confusing, ambiguous and misleading. Altman explains the seriousness of situations might be underestimated through furnishing an example. If a company has a poor profitability that is considered a warning sign for possible bankruptcy and the same company has a liquidity ratio (indication of a company's financial health) that is

above average. The seriousness of this contradicting outcome is that both these ratios are built into the same analysis.

Altman and Hotchkiss (2006:239) disagreed with Beaver (1966:85) regarding the univariate analysis failure prediction ability. Their view is that this analysis technique does have potential to predict bankruptcy; however, in order to improve on this analysis technique, a multivariate needs to be applied. The multivariate analysis is based on objective weight in order to expel the ambiguity and no longer be misleading. This is the core reason for the basis of using the MDA. Tuvadaratragool (2013:49) and Laitinen and Kankaanpaa (1999:67-68) concur even though the studies conducted by Edmister (1972:1479) and Blum (1974:2) were based on different criteria, both using the MDA. South African studies conducted by Hlalha (2010) and Rama (2012) have excluded the financial and mining sector, due to their difference in profitability structures and the sound regulations governing the sector. The empirical study will therefore also exclude the financial and mining sector.

2.7 FINANCIAL RATIOS AS THE CORNERSTONE OF DIFFERENT BANKRUPTCY MODELS

2.7.1 Introduction

In determining the qualitative aspects, different financial ratio analyses will be observed as was found in most of the earlier studies conducted on the failure prediction models, as their foundations were built on the financial ratios.

A summation of the studies conducted over the years by the trend setters in the field Beaver (1966), Altman (1968), Blum (1974) and Edmister (1972) based on the financial ratios used in each study, is noticeable in Table 2.4 below. The studies below used one or two similar financial ratios. In the current study the majority of these financial ratios that have been used by these various models in order to determine failure or non-failure of companies will be employed.

Table 2.4: Financial ratios used in earlier studies

Ratio	Beaver (1966)	Altman (1968)	Edmister (1972)	Blum (1974)
Net income/Total assets	√			
Earnings after taxes/Total assets		√		

Ratio	Beaver (1966)	Altman (1968)	Edmister (1972)	Blum (1974)
Net income/Common equity				√
Net worth/Sales			√	
Sales/Total assets		√		
Working capital/Total assets	√	√		√
Total liabilities/Total assets	√			
Total liabilities/Net worth				√
Funds flow/Total debt	√			√
Funds flow/Current liabilities			√	
Retained Earnings/Total asset		√		
Current assets/Current liabilities	√			
Quick assets/Current liabilities			√	
Current liabilities/Net worth			√	
Inventory/Sales	√	√		

Source: Chen and Shimerda (1981:57)

The findings of Table 2.4 shows that Working capital / Total assets have been applied by Beaver (1966), Altman (1968) and Blum (1974) and (Fund flow =cash flow/Total debt) was implemented by Beaver (1966) and Blum (1974), and these were the only common ratios used. Due to the commonalities being the lesser, these models cannot be used in isolation; better results will be obtained if these models can be applied in consolidation.

2.8 CONCLUSION

This chapter presents the principles of financial ratio analysis and failure prediction models based on the conducted literature review. It was determined that various models have been developed. In total, four bankruptcy models were studied, and trying to find the relationship between the models, it was determined that these four models are based upon financial ratios, cash flow, stock returns and variance of return variables. Previous studies have shown mismanagement or management error as the prime cause of bankruptcy. Literature has also identified the most common bankruptcy prediction models were developed by Beaver (1966), Altman (1968), Edmister (1972) and Blum (1974).

Finally, the chapter concludes by presenting the summary of ratios used in the different models. Of the ratios used in the models by the forerunners in the field, not more than two identical ratios was applied in the four studies conducted by the likes of Beaver (1966), Altman (1968), Edmister (1972) and Blum (1974), even though the sample and criteria of the sample were not the same. Nonetheless, these models have been the major players within this field of study, yet the financial ratios used within these prediction models were vastly diverse. Agreeing with Chen and Shimerda (1981:51), financial ratios are useful, different researchers use different ratios. Out of the 26 studies conducted by Chen and Shimerda and 100 financial items used, 65 were accounting ratios and 41 of those ratios were identified as being useful by various researchers. Yet it cannot be said that all 41 ratios are of equal importance, as the importance of a ratio depends on the objective of the researcher.

The following chapter will present the research design and methodology used in this study, as well as the justification for choosing the research design (for example, exploratory research and secondary data technique) based upon the purpose of the study.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

The focus of this study is to investigate whether financial ratio analysis can successfully predict company failure of JSE listed companies in the current global environment. Implementing a mixed method approach, making use of qualitative and quantitative research methodology were applied throughout the study. Creswell (2014:4) defines mixed method as the collections and integration of both qualitative and quantitative data and the research problem is better understood by applying this approach. An extensive literature review on the development of financial ratios and failure prediction models led to determining the qualitative framework. Qualitative research places emphasis on meaning and processes, and does not examine or measure in terms of amount, quantity or frequency. According to Zikmund *et al.* (2013:135) emphasis is placed on observation and interpretation. De Vos *et al.* (2002:79) indicate that the primary focus of qualitative research is not in explaining, but rather in understanding.

After realising the qualitative objective of the study, the quantitative research was conducted and formed part of the empirical study. Brynard *et al.* (2014:39) make it clear that quantitative puts data together by evaluating things and objects in other words and simply put forward by Welman *et al.* (2005:8), the importance is placed on measurement and analysis of the associations between variables rather than involving the investigation of processes. Zikmund *et al.* (2013:135) adds that quantitative research orderly and meaningfully assigns numbers. Mouton (2011:164) asserts utilizing quantitative analysis is preferred by an epistemological stance making use of secondary data which already exist. Burns and Grove (2011:20) summarised research methodology as research methodology equals research method plus research design. Henning *et al.* (2004:36) describes methodology as the studies value and the motive why the study has been chosen and not mere methods being collected.

A rundown of the research methodology warranting the research designed that will be used and explaining how data will be collected and the analyses, will be the

primary aim of this chapter. The chapter will look at the research problem and formulation thereof. An elaboration of the research design will be covered, as well as a comprehensive report of the population as explained by Welman *et al.* (2005:53), a population being a full set of cases from which a sample is taken. The sampling design will be given, the data collection will be discussed and a description of the analytical approach will be imparted. A brief differentiation between the univariate and MDA models is given and ultimately a conclusion of the chapter will be drawn.

3.2 RESEARCH PROCESS STAGE, PROBLEM AND FORMULATION

3.2.1 Research Process Stages

This is a brief indication of the route the research will take and the various stages to be reached. Mouton (2011:48–49) refers to this process as phases. Zikmund *et al.* (2013:59) identify the stages as follows, which will be the process taken by this research.

1. Defining the research objective (research problem)
2. Research design
3. Population and sampling
4. Data collection
5. Data analysis
6. Conclusion formulated

Considering this process, the study will focus on the issues and concerns that have been identified within the literature in relation to the present study, by making use of the univariate analysis and the multivariate analysis. The basis of all three these methods are statistical, which is accounting-based and analysed over duration of time. The grounds for using these methods is to ensure the reliability of the data used and the conclusion derived.

3.2.2 Research Problem

Creswell (2014:20) describes the research problem as “*an issue or concern that needs to be addressed*”. The gaps or negligence in the literature or a dispute in research creates these issues or concerns. Specific approaches need to be taken to handle specific research problems. Creswell continues by identifying different types of research approaches of which the mixed method approach is one, and it was identified to be best suited to study the effective and usefulness in predicting company failures in the current company environment. The problem is whether company failure within the current business environment can still be effectively predicted using financial ratios that were developed in the 1930s.

3.2.3 Problem Formulation

Zikmund (2003:8) identifies the problem and opportunities to be the initial and pre-eminent phase in research. Davis (2005:100-104) explains that the formulation of the problem determines the direction and extent of research that needs to be followed. Kumar (2014:39) suggests the following need to be taken into consideration when determining the direction and extent of research: time available, accessibility of resources for instance financial resources, knowledge in the field of study, knowledge concerning important disciplines and the statistics required for analysis purposes. With the problem being identified, the direction of study will be the analysis of secondary data and the extent of research will be over a five year period from 2007 to 2012.

3.3 RESEARCH DESIGN

Subsequent to the identification of the research problem and the formulation thereof the research design needs to be evolved. Kumar (2014:39) states this is a crucial stage in research as it enables the researcher to arrive at valid findings, comparisons and conclusions. A faulty design results in misleading findings and has the same effect as a waste of human and financial resources.

Mouton (2011:55) describes this phase of research as a plan or blueprint on how the researcher intends conducting the research. Henning *et al.* (2004:30) point out the rationale behind the research design is to tackle different kinds of questions. Punch (2006:47) adds that the research design assists in connecting the research questions

to the data. Davis (2005:134–135) concurs with Mouton that the research design is seen as a road map for researchers enabling the researcher to have the means and methods of solving the research problem.

3.3.1 Purpose of research

The motive of using research can be split into basic and applied research. Neuman (2011:26) and Durrheim (2006:45) both describe basic research as an improvement of basic knowledge. According to Brynard *et al.* (2014:7), the purpose of basic research is to develop theories, which was in agreement with Huysamen (1994:34) and Smith (1995:4). Applied research is reported by Neuman (2011:27) to suggest useful results to existing problems and this view is shared by Durrheim 2006 and Zikmund *et al.* 2013. Brynard *et al.*, (2014:8) and Huysamen, (1994:34) and Smit, (1995:4) claim that applied research is used with the objective to solve problems that are practical.

Mouton (2011:164) explains the research design is classified, based on empirical studies that comprise of secondary numeric data that is statistically medium-controlled. Mouton (2011:57) further states that empirical studies can utilize either primary data which includes surveys, experiments, interviews or observations or secondary data consisting of text or numeric data that already exist. Kumar (2014:171-172) refers to this empirical study as consisting of two major approaches of data gathering and makes a distinction between them, namely primary data gathering which is obtained firsthand and the secondary data gathering which is data that is readily available and only needs to be extracted. The research instrument or tool utilized for the purpose of this study is the secondary data obtained from the McGregor BFA database. The purpose of the research is to determine the financial ratio's ability to indicate financial trouble and not to identify the best failure predictors.

3.3.2 Secondary data

Kumar's (2014:196) view is that this type of data is already available and only needs to be extracted, analysed and communicated. Struwig and Stead (2001:80) categorize secondary data as (i) raw data normally obtained from, for instance, surveys, (ii) data summaries acquired from agencies, for example Statistics SA and (iii) written data from books, articles and thesis.

The quality of this data type needs to be measured; Babbie (2013(a):64) indicates that the following three criteria can be used to measure the quality, namely precision and accuracy. Precision being the fineness of a distinction made between attributes that make up a variable and accuracy giving a better reflection of the data. Next is validity according to De Vos *et al.* (2011:173) who believe that the definition of validity can be grouped: firstly whether the instrument can measure the concept in question, followed by the concept being measured accurately. Babbie (2013(a):64) concurs with De Vos *et al.* (2011:173) by stating that data is valid when the measurement accurately reflects the concept it intends to measure. This is also in concurrence with Leedy and Ormrod (2005:28). Finally, reliability of data is explained by Moser and Kalton (1989:353) as a scale or test that will give the same result if the measurement is done under consistent conditions and De Vos *et al.* (2011:177) is in agreement. Babbie (2013(a):64) refers to reliability as that the same data will result in the same outcome. Kumar (2014:215) states data needs to be constant, stable and accurate. Reliability was ensured by making use of a test group of non-failed companies. The selection criteria depend on the Top 40 JSE listed index companies discriminating firstly against financial and mining sectors, industries not on the delisted companies' list, availability of financial statement data and lastly, but least important, the companies with the closest assets size.

This study meets the criteria of both validity and reliability as the data is obtained through a JSE portal which is also a reputable database; the data is accessible, accurate and publically available. Data will be able to measure the objectives and can be said to be reliable. The three criteria: precision and accuracy, validity and reliability as referred to by Babbie (2013(a):64) have been met by this study. The study is not only on delisted companies, but also on delisted companies due to bankruptcy; the instrument used meets the validity and reliability requirements as it is secondary data from a reputable database.

3.3.3 Types of research

McMurray (2007:11) points out that researchers have come to know what they know through many research types they have adopted. Brynard *et al.* (2014:8) explain that a particular field of study is often linked to different types of research.

Kumar (2014:11) maintains that the objective of different types of research must be able to determine how appropriate a specific research method is in finding and

answering the research questions posed. The research type to be used in this research is from an objective perspective that is based on purpose and goal.

Zikmund *et al.* (2013:52) say there are three types of research commonly used, namely: exploratory, descriptive and explanatory, and this is in concurrence with Durrheim 2006, Davis 2005 and Neuman 2006. Babbie (2013(a):42-43) calls it the three most common and useful purposes of research, exploratory being when the researcher familiarizes with the research topic. Descriptive observes and describes what was observed and explanatory explains the why of an event.

Neuman (2006:33) and Zikmund *et al.* (2013:52) agree that the exploratory research type is normally the first step in research, anticipating extra research to be conducted to provide more conclusive proof. This research type is administered to shed light on vague situations or to uncover potential business opportunity ideas or to clarify decisions that need to be made. Kumar (2014:13) asserts that this research type is the most suitable research type in areas of study where little is known. Cavana *et al.* (2001:108) maintain that the nature of a certain problem that has previously required a few studies to be conducted, is better understood. Neuman (2011:38) comments that exploratory research creates a general mental picture of surroundings.

Kumar (2014:13) contends that descriptive research gives a description, for instance about a situation, systematically; problems and phenomenon provide information and describe attitudes with regard to certain issues. Zikmund *et al.* (2013:53) purport that descriptive research attempts to paint a picture of a given situation by describing characteristics of environment, objects and ranges. Various authors for example Brynard *et al.* (2014:8); Babbie (2013(a):43) and Neuman (2006:35) have concluded this research type is based on a description given of what the researchers have observed.

Kumar (2014:13) indicates that explanatory research focuses on the why and how of a relationship. Zikmund *et al.* (2013:54) refer to this type of research as being very powerful as it leads to greater control, as the aim is to spot the cause and effect of a relationship. When the cause of outcomes is known, decisions are made and conducted in a positive fashion. These three research types could on numerous occasions be described as building blocks; the exploratory build foundations for the descriptive, descriptive in turn initiate the basis for explanatory research. Even though this study is capable of applying all three types of research by using

explanatory research to spot the cause of bankruptcy or failure, the descriptive to describe it and the exploratory to understand the problem. This research will employ the exploratory only as it is the most suitable research type for this study, as no confirmation has been imparted of any study conducted in South Africa (SA) on the usefulness of financial ratios. For that reason the exploration of the usefulness of financial ratio in a South African (SA) context has been brought about. Bless *et al.* (2013:62) explain that when there is limited knowledge or information on a specific area under discussion and the research aim is to obtain a better understanding of a situation, phenomenon or community, this research type is employed. Creswell (2014:220-225) refers to exploratory as when *“the qualitative data builds up to the quantitative data that will be interpreted, as the starting point will be qualitative phase followed by the quantitative phase.”*

3.4 POPULATION AND SAMPLING

3.4.1 Population

Babbie (2013(b):134) describes a population as a group or a collection of interest in general from which elements of a sample are selected. Zikmund *et al.* (2013:385) affirm a population as a common set of attributes shared in a complete group. Brynard *et al.* (2014:57) claim it as being a group of elements that contain certain characteristics that researchers are interested in. In other words, a population is every-one of interest in the field to be studied. The target population in this research includes all companies listed on the Johannesburg Stock Exchange (JSE) for the period 2007 to 2012. Mabhunu (2004:13-15) explains that the now JSE Limited (JSE) was founded November the 8th 1887 by Benjamin Woollan.

The establishment of the JSE was first and foremost to equip investors to buy and sell their shares. This is after the Witwatersrand Gold Fields and later the formation of mining and investments companies. The JSE has been operating as a market place for trading for almost 127 years. It has been licensed as an exchange under i) The African Premier Exchange and ii) The Security Services Act of 2004. The JSE is the major provider of financial information and has progressed from a conventional floor-based equities trading market to a modern securities exchange. It tries to settle securities and other associated instruments, provides full electronic trading, clearing and has substantial surveillance abilities. By end May 2003, 443 companies were

listed with a market capitalization of R1460 billion. Unlike South Africa which only has one stock exchange, there are countries like America that have up to three stock exchanges (New York Stock Exchange, NASDAQ, American Stock Exchange). The JSE's prior form of supremacy was the Stock Exchange Control Act of 1985 and currently they are being governed by the Service Act of 2004, Act of Parliament and they also have their own directives and guidelines they were previously governed by (Correia *et al.*, 2011:13.3).

JSE has 10 primary industries and secondary, more defined sectors that fall under these 10 industries. These industries are categorized as basic materials, consumer goods, consumer services, financials, health care, industrials, oil and gas, technology, telecommunications and utilities. Table 3.1 below will illustrate the primary industries and the abbreviations that will be used in this study for these industries.

Table 3.1: JSE Industries

Industry	Industry abbreviation	Industry	Industry abbreviation
Basic Resources	BR	Industrials	IND
Chemicals	CHEM	Oil + Gas	O&G
Consumer Goods	CG	Technology	TECH
Consumer Services	CS	Telecommunications	TC
Financials	FIN	Utilities	UT

Source: JSE (2014) adjusted for own research

Table 3.1 above illustrates all the industries in the Johannesburg Stock Exchange (JSE) and within the above industry there are sectors. The rationale for using listed companies is that their financial data, for instance the financial statements, is easier accessible and available than the financial statement of private or non-listed companies. The target population has a cut-off period of 2007 to 2012.

3.4.2 Sampling

Zikmund *et al.* (2013:385) refers to a sample as some smaller part of the larger population. Zikmund *et al.* (2013:66) continue by stating that a sample is a process from which a conclusion is drawn. This is based on a portion of the population. Brynard *et al.* (2014:56) define sampling as a “*technique employed to select a small group (the sample) with the view to determining the characteristics of a large group (the population).*” Brynard *et al.* continue by stating the advantage of a sample being formulated is to cut cost, save time and simplify the research being conducted. Adams *et al.* (2009:96) express it as being vital that a sample represents the population.

The techniques used to select a sample from a population can be divided into two groups, probability and non-probability. These two techniques are the inverse of each other. Welman *et al.* (2005:56) explain probability is when it is probable that an item can be included in a sample, meaning all items have an equal opportunity of being included and non-probability is when there is a zero chance of all or any item being included. Types of sampling for each category are as follows: probability is simple, stratified, systematic and cluster sampling. Non-probability is accidental or incidental, quota, purposive, snowball, self-selection and convenience.

In this study the non-probability technique will be applied as according to Leedy and Ormrod (2014:220). There is neither guarantee nor any prediction that can ensure all the items in the population will be selected as the sample. The type of sampling that will be employed in this study is quota sampling and it is so nicely explained by Leedy and Ormrod (2014:220) as a type of sampling that selects items not in a random manner, but in the same proportion. Babbie (2013(a):75) clarifies this explanation by stating the selection of items in this sampling type is based on characteristics that are pre-specified. The rationale for this selection method is that the same characteristics exist in the total sample of the population being studied. In order for companies to be selected in the case of this study, they will have to meet the determined criteria. Comparison of samples dated 2007 to 2012 will be split into two groups: failed and non-failed. (1) Delisted companies have been identified and an investigation was done to determine the reason for delisting. (2) Delisted companies that fit the dataset of failure companies were identified and the financial

statements were analysed by conducting financial ratio analysis to determine whether failure could have been predicted.

A complete list was compiled from the Who Owns Whom (WOW) website of all the delisted companies for the period 2007 till 2012. The complete list consisted of 129 companies. The sequence of company elimination to be followed will be as follows. Firstly the companies delisted during the cut-off period that fall under the financial and mining sectors will be eliminated. Secondly companies delisted not due to bankruptcy will be indicated. These are mainly due to mergers or take-overs, company disposals, restructuring and scheme of arrangement. The companies that have been delisted due to a schemes of arrangement have been indicated, including the companies having entered into an arrangement based on the definition in The Companies Act 71 of 2008, section 114 as: *“Unless it is in liquidation, or in the course of business rescue proceedings in terms of Chapter 6, the board of a company, may propose and, subject to approval in terms of this Part, implement any arrangement between the company and holders of any class of its securities, including a reorganisation of the share capital of the company by way of, among other things— (a) a consolidation of securities of different classes; (b) a division of securities into different classes; (c) an expropriation of securities from the holders; (d) exchanging any of its securities for other securities; (e) a re-acquisition by the company of its securities; or (f) a combination of the methods contemplated in this subsection.”*

In the light of this, Routledge and Gadenne (2000:233) add that in order to deal with financial distress, companies would reorganise, meaning that bankruptcy is not an exclusive end product according to Coat and Fant (1993:147). Nevertheless, Tuvadaratragool (2013:66) states that companies that are financially weak will always end up going bankrupt. Stats SA (2014:5-6) released the percentage of company liquidation over 2007–2012 and has divided these liquidations into voluntary and compulsory company liquidations. The total company liquidations for 2007 were (6.3%), 2008 (6.45%), 2009 (5.65%), 2010 (5.48%), 2011 (5.28%) and 2012 (7.26%). Delisted companies not due to bankruptcy will be removed from the sample. Companies that have been delisted due to a scheme of arrangement will be deleted from the sample list. Table 3.2 below illustrates the delisted companies for the period under review and the reason for delisting.

Table 3.2: JSE listed companies not associated with bankruptcy

Industry	Code	Company	Date	Reasons
IND	PSC	Pasdec Resources SA Ltd	2007/01/22	Disposal of co
C G	NMS	Namibian Sea Products Ltd	2007/01/29	Scheme of arrangements - Bidvest
IND	CSL	Consol Ltd	2007/04/11	Scheme of arrangements - Brait
C S	PTG	Peermont Global Ltd	2007/04/25	Scheme of arrangements – Mineworkers Investment Company
C S	ECO	Edgars Consolidated Stores Ltd	2007/04/28	Scheme of arrangements - Shareholders
C S	UTR	Unitrans Ltd	2007/05/29	Disposal of co
TECH	BRY	Bryant Technology Ltd	2007/06/18	Scheme of arrangements – Zamori 243 (Pty) Ltd
C S	BRC	Brandcorp Holding Ltd	2007/09/04	Scheme of arrangements – Main street 566
C S	PMA	Primedia Ltd	2007/10/01	Scheme of arrangements – General Trading (Pty) Ltd
TECH	BTG	Bytes Technology Group Ltd	2008/01/15	Scheme of arrangements – Allied Electronics Corporation Ltd
C S	ELH	Ellerine Holdings Ltd	2008/01/22	Scheme of arrangements – African Bank Investments
C S	TAL	Tiger Automotive Ltd	2008/03/04	Scheme of arrangements – Tiger Automotive Investments
C G	BSB	The House of Busby	2008/04/30	Scheme of arrangements – Ethos Private Equity
IND	SUL	SAB & T Ubuntu Holdings Ltd	2008/07/07	Scheme of arrangements – Simeka Business Group
C S	TRT	Tourism Investment Corporation Ltd	2008/09/09	Scheme of arrangements – Primetime Trading 6 (Pty) Ltd
IND	ENV	Enviroserv Holdings Ltd	2008/11/04	Scheme of arrangements - Parchment Trading 72 (Pty) Ltd
IND	KWS	Kwikspace Modular Buildings Ltd	2009/02/24	Scheme of arrangements – Clidet No 803 (Pty) Ltd

Industry	Code	Company	Date	Reasons
IND	VTL	Venter Leisure & Commercial Trailers Ltd	2009/02/24	Disposal of co
CS	CEL	Celcom Group Ltd	2009/05/26	Scheme of arrangements – V Cellular Stores
C S	KNG	King Consolidated Holdings Ltd	2009/10/27	Scheme of arrangements – Pocot Trust
IND	TWP	TWP Holding Ltd	2009/12/21	Scheme of arrangements – Basil Read Holging Ltd
CS	ELE	ElementOne Ltd	2010/01/11	Scheme of arrangements – Sherbourne Capital Ltd
CG	EMG	Emergent Properties Ltd	2010/03/08	Voluntary delisting
IND	SPO	Set Point Group Ltd	2010/05/25	Disposal of co
TECH	DTH	DTH Dynamic Technology Holdings Ltd	2010/09/14	Scheme of arrangements – DTH Management Consortium
IND	ABU	a.b.e. Construction Chemicals Ltd	2010/09/28	Scheme of arrangements – Chryso Southern Africa (Pty) Ltd
IND	CCI	CIC Holding Ltd	2010/11/16	Scheme of arrangements – Imperial Holding Ltd
TECH	DDT	Dimension Data Holdings Ltd	2010/12/14	Scheme of arrangements – Nippon Telegraph & Telephone Corporation
TECH	SPS	Spescom Ltd	2011/01/25	Scheme of arrangements – Jasco Electronics Holding Ltd
TECH	UCS	UCS Group Ltd	2011/10/25	Scheme of arrangements - Shareholders
IND	UNI	Universal Industries Corporation	2011/11/01	Scheme of arrangements – Ethos Private Equity Fund
TECH	PCN	Paracon Holdings Ltd	2011/11/28	Scheme of arrangements – Adcorp Holding Ltd
TC	VOX	Vox Telecom Ltd	2011/11/29	Scheme of arrangements – Business Venture Investment No 1542 Ltd
IND	ABK	African Brick centre Ltd	2012/01/10	Scheme of arrangements – Yakani Infracore (pty) Ltd
IND	KIR	Kairos Industrial Holding Ltd	2012/02/13	Failed to submit results to JSE on time

Industry	Code	Company	Date	Reasons
CG	ITR	Intertrading Ltd	2012/03/16	Disposal of company
IND	OLI	O-Line Holdings Ltd	2012/07/03	Scheme of arrangements – OBO Bettermann GmbH & Co KG
C G	CVI	Capevin Investments Ltd	2012/08/13	Scheme of arrangements – Capevin Holding Ltd
CS	AVU	Avusa Ltd	2012/09/25	Scheme of arrangements – Times Media Group Ltd
IND	EXL	Excellerate Holdings Ltd	2012/10/09	Scheme of arrangements - Shareholders
IND	CRM	Ceramic Industrial Ltd	2012/11/27	Disposal of co
IND	SFH	SA French Ltd	2012/12/03	Scheme of arrangements – Torre Industrial Holding Ltd
IND	PSC	Pasdec Resources SA Ltd	2007/01/22	Disposal of co

Source: Who Owns Whom (2014)

Table 3.2 above gives a clear indication of all the delisted companies not included in the sample due to non-bankruptcy reasons. The companies delisted due to bankruptcy have been excluded from the list above and the companies delisted for other reasons have already been eliminated in the first stage of the elimination process. The remainder of the sample is equal to eight delisted companies due to bankruptcy. In this study, delisted companies are identified as delisted when they have been delisted from the JSE. BDO (2011:40-42) interprets delisting of companies as caused by many reasons some of the reasons were highlighted by BDO, an auditing firm, and are as follows:

- The burden and the cost related to compliance are too tedious.
- Investors are not interested due to the liquidity lack.
- The only market to sell shares to is the major shareholders.
- There is no increase in the share price in spite of large dividends being paid.
- In the long term the share price is not moving in line with the companies' profits.
- The listing is no longer beneficial due to the exuberant costs related to a company being and remaining listed.

According to the JSE the total number of companies that have delisted for that period are exhibited in Table 3.3 below.

Table 3.3: Number of companies delisted due to bankruptcy (2007-2012)

Year	Number of delisting	Percentage of delisting
2007	3	38%
2008	0	0%
2009	4	50%
2010	0	0%
2011	0	0%
2012	1	12%
Totals	8	100%

Source: Adopted by Tuvadaratragool (2013:70) adjusted own research

In 2007 three of the eight companies (38%) were delisted; in 2008 no companies were delisted meeting the above-mentioned criteria. In 2009 four of the eight companies (50%) were delisted in, 2010 and 2011 none of the total eight companies were delisted due to bankruptcy. In 2012 one company was delisted, portraying 12%.

Companies delisted due to merger, take-over or disposals, etcetera, will be excluded from the sample. The financial service sector and the mining sectors will also be excluded from the sample, on the grounds that different standards are used in the preparation of the financial statements. Hlaha (2010:5) stated that the reason for the exclusion of the financial sector is due to this sector being “*heavily regulated*”. Rama (2012:7) states that the reason for the exclusion is because these sectors are specialized sectors and have different asset and profit structures. Table 3.4 below includes the sample of delisted companies from the JSE that have adhered to the requirements in order to be included in the sample. Summations of the requirements are as follows:

- Companies need to be delisted from the JSE.
- Companies need to have been delisted due to bankruptcy.
- Delisting period should have occurred for the period 2007-2012.

- Companies delisted from the JSE, during the cut-off period from the banking and mining sector, will be excluded from the sample.
- Companies delisted due to the likes of merger, take-overs, disposal or scheme of arrangements, will be excluded from the sample.

The sample of delisted companies due to bankruptcy is demonstrated in Table 3.4 below

Table 3.4: Sample of the JSE delisted companies.

Industry	Code	Company	Date
CG	ALC	Amlac Ltd	07/04/16
CG	PAL	Pals Holding	09/03/16
CG	TIW	Tiger Wheels Ltd	09/04/20
CG	WES	Wesco Investment Ltd	09/07/06
CS	RAG	Retail Apparel Group Ltd	07/04/16
CS	TRX	Terexko Ltd	07/04/16
IND	NEI	Northern Engineering Industries Ltd	09/02/16
IND	DLG	Dialogue Group Holding Ltd	12/02/13

Source: Who Owns Whom (2014)

Making use of the sample selector, Table 3.4 above identified eight companies that met the criteria within the three JSE industries that will be included in the sample. Table 3.5 below gives a summary of the elimination phases of the failed group of companies.

Table 3.5: Stage of elimination of failed group of companies

Stage 1: Industry	Total sample	Financial and Mining	Other
	129	55	74
Stage 2: Reasons	Total failed	Bankrupt	Other
	74	15	59
Stage 3: Financial data	Available	Five year period before delisting	Not five years period before listing
	15	8	7

Source: Adopted from Momberume (2012:58) adjusted for this study

In Table 3.5 above the stages of elimination can be observed. This was done according to the elimination criteria. Asset size has not been included in the list, due to it only being a guideline.

A controlled group is formulated consisting of a list of JSE Top 40 index companies. The reason for utilizing the JSE Top 40 index companies is the improbability of these companies experiencing financial difficulties (Rama, 2012:7). This control group will represent our non-failed group of companies displayed in the table 3.6 below. Selections of the non-failed group of companies are as follows and listed in order of importance:

- Top 40 JSE index company (if not available, listed company in the same industry).
- Non-failed companies able to be matched with failed companies based on the same industry.
- Non-failed companies able to be matched with failed companies based on the same fiscal year (meaning having the same financial year ends) will be used. According to Tuvadaratragool (2013:72), by matching the companies based on fiscal years, the changes over the same period will be accounted for.
- Non-failed companies able to be matched with failed companies based on closest asset size using the latest financial statement. Norton and Smith (1979:73) believe asset sizes are more stable over time than net sales. This criterion is least important and the judgements will be flexible and lenient, as it is expected that these companies do not meet this criteria, the rationale being the difference in the

two groups used. Group one is failed groups of companies and group two is non-failed group of companies represented by the controlled group of companies that have been selected from the JSE Top 40 index companies. These companies in group two have a track record of not being likely to fail, as they are well established companies that have been around from as early as the 20th century. For instance, some of these companies were founded many years ago, like Shoprite (1979), Steinhoff International (1964), Woolworths (1931), etcetera. It is therefore expected that there will be a huge difference in the assets size of the failed company they will be matched with. In the Table 3.6 below, the JSE Top 40 listed index companies are demonstrations of the full list, excluding the financial and mining sectors and were selected on the criteria mentioned above, and used as a control group.

Table 3.6: Control group consisting of JSE Top 40 index companies

Industry	Code	Company	Industry	Code	Company
BR	KIO	Kumba Iron Ore Limited	CS	MSM	Massmart Holding Limited
BR	MNP	Mondi Plc	CS	TRU	Truworths
BR	MND	Mondi Limited	HC	APN	Aspen Pharmacare Holding limited
CG	BTI	British American Tobacco Plc	HC	MDC	Mediclinic International Limited
CG	SAB	SAB Miller Plc	IND	REM	Remgro Ltd
CG	CFR	Compagnie Financiere Richemont	IND	BVT	Bidvest Group Limited
CG	TBS	Tiger Brands Limited	IND	IPL	Imperial Holding Limited
CG	SHF	Steinhoff International Holding Limited	O&G	SOL	Sasol
CS	NPN	Naspers Limited	TC	MTN	MTN Group Limited
CS	SHP	Shoprite Holding Limited	TC	VOD	Vodacom Group Limited
CS	WHL	Woolworths Holding Limited			

Source: Courtney Capital (2014)

Table 3.6 illustrates the JSE Top 40 index companies after the financial and mining sectors have been eliminated. In Table 3.7 a summation of the elimination process of the non-failed companies is exhibited.

Table 3.7: Stages of elimination of non-failed group of companies

Stage 1: Industry	Total sample	Financial and Mining	Other
	40	19	21
Stage 2: Matching failed industry	Total failed	Same Industry	Other
	21	12	9
Stage 3: Financial data	Available	Five year period before delisting	Not five years period before listing
	12	4	8
Stage 4: Other companies within industry	Total	Needed	
	4	4	

Source: Adopted from Momberume (2012:58) adjusted for this study

Table 3.7 above shows that four companies are needed from the same industry that have not failed and did not appear on the JSE Top 40 index list of companies. Of the Top 40 index companies, the only companies that will be used in the matching group will be the companies within the same industry as in the failed group, meaning that the basic resources industry will be eliminated. Health care industry, Oil and Gas, Technology and Telecommunications industry will also be eliminated due to the fact that there is no financial statement data available for the same time period as that of the matched failed company. Similar companies will be identified in the same industry over the same time period and with the closest asset size which will be illustrated in Table 3.8 below in the final control group which is a total of eight companies. Companies are selected firstly from the JSE Top 40 index company and if no match is found, companies within the same industry with financial statement data over the same time period will be used obtained from the McGregor BFA

database. Table 3.8 indicates the final selection of companies included in the non-failed group of companies.

Table 3.8: Final list of the non-failed companies

Industry	Code	Company
CG	MTA	Metair Investment Ltd
CG	CFR	Compagnie Financiere Richemont
CG	SHF	Steinhoff International Holdings Limited
CG	SER	Searidel Investments
CS	SHP	Shoprite Holding Limited
CS	WHL	Woolworths Holding Limited
IND	HWN	Howden-Africa Holdings
IND	WKF	Workforce Holding

Source: Courtney Capital (2014) and McGregor BFA (2014)

Table 3.8 is a demonstration of the total list of non-failed companies the failed companies will be matched with.

The financial statement data will be drawn five years prior to bankruptcy or based on the availability of the financial statement data over a five years period before bankruptcy. The financial statement data order does not have to be immediately consecutive to the delisting, the importance is that financial statement data have to be over a continuous five year period and the control group representing the non-failed group of companies' data will be drawn in accordance with that of the failed group of companies. These financial statements will be obtained from the McGregor BFA database in a standardized format. Therefore if there is no financial statement data available over a five years period for any of the failed group of companies, that company will be excluded from the sample. If there is no company on the controlled group of companies that represents the non-failed group of companies based on the same industry, the same fiscal period but there is no financial statement data, the company on the controlled group list will be removed and a company in the same industry that meets all three requirements, will be matched to the failed company.

Steyn *et al.* (1996:141) explain when individual values need to be compared in one dataset to another, the standardization techniques need to be applied. Oberholzer and Van der Merwe (2010:33) agrees in order to make values comparable, standardized values need to be used. This format will be used, as a comparison will be done and the published financial statements are from investor's perspective, as it represents actual amounts.

An indication of when the company in the sample went bankrupt five years before the date of bankruptcy, the standardized format financial statement data will be drawn of the delisted companies (failed) and the controlled group (non-failed) in the same industry, for the same fiscal period from the McGregor BFA database. Financial statements include the Statement of financial position (previously known as the balance sheet) Statement of comprehensive income (previously known as the income statement) and the Statement of cash flow (previously known as the cash flow statement). This is done in order to identify whether bankruptcy or distress could have been detected in the failed companies in comparison to the non-failed company, by evaluating the outcome of the analysis conducted.

The pairing approach is applied by pairing the failed (delisted) companies with the non-failed companies which is the controlled group (represented by the JSE Top 40 index). This approach has been applied in the majority of the former studies conducted. Beaver (1966:74) referred to this approach as the paired sample design and stated the reason for selecting this design in earlier studies was to help control the elements that may cause the association between ratio and failure to be vague. Blum (1974:6) claims the rationale behind the pairing criteria is to avoid the matching of dissimilar companies. Babbie (2013(a):103) recommends this approach as one of the ways of achieving comparability between groups; the pairs are matched based on their similarities of one or more variables.

The application of the pairing approach is done in the attempt for this study to remain consistent with previous studies conducted by the field pioneers, specifically Beaver (1966), Altman (1968) and Blum (1974). The pairing of the failed and non-failed companies was prepared according to the following criteria i) same industry ii) same fiscal year's financial statements will be used (this is to make the companies more comparable) iii) close size of assets, (this is acquired from the statement of financial position one year before the date of bankruptcy) and the unprocessed data displayed

will then be closely scrutinized. The assets size is not of such importance as the difference in the years of establishment between the failed and non-failed companies. They have been taken into consideration resulting in a vast difference in the value of the assets. Matching of the failed and non-failed companies will be guided by the failed companies and the prescribed criteria: firstly the same industry, the same time period and the closest asset size. The non-failed companies will then be matched to the failed companies accordingly. A list of failed companies matched with the non-failed companies and the time period financial statement data are available as illustrated in the Table 3.8 below. This table has been adopted from Tuvadaratragool (2013:74) and adjusted to accommodate this study. The companies illustrated in Table 3.9 have been paired, the failed with the non-failed companies in accordance with the required criteria, and will be utilized to determine whether financial distress can be identified within the five year period prior to failure.

Table 3.9: List of matched companies

Failed companies		Non-failed companies		Industry	Availability of financial statement data
Code	Company	Code	Company		
ALC	Almac Ltd	MTA	Metair Investment Ltd	CG	1996-2000
WES	Wesco Investment Ltd	CFR	Compagnie Finaniere Richemont	CG	2005-2009
PAL	Pals Holdings	SHF	Steinhoff International Holdings Ltd	CG	2003-2007
TIW	Tiger Wheels Ltd	SER	Sear del Investments	CG	2002-2006
RAG	Retail Apparel Group Ltd	SHP	Shoprite Holding Ltd	CS	1997-2001
TRX	Terexko Ltd	WHL	Woolworths Holdings	CS	1998-2002
NEI	Northern Engineering Industries Ltd	HWN	Howden Africa Holding	IND	1996-2000
DLG	Dialogue Group Holding Ltd	WKF	Workforce Holding	IND	2006-2010

Source: Adpoted from Tuvadaratragool (2013:74) adjusted for this study

Table 3.9 suggested the matched companies which constitute our sample in view of the fact that the above companies met the criteria as they are within the same industry, same five year period under review and have the closest assets size.

3.5 DATA COLLECTION

Welman and Kruger (1999:129) advise that in light of the research problem and population in question, the most suitable data collection method needs to be taken into consideration. Brynard *et al.* (2014:37) states that data collection consists of two primary methods: the qualitative method utilized the following techniques per Kumar (2014:192) interviews, observations and secondary sources; and according to Brynard *et al.* (2014:39), the quantitative method employs techniques, namely observations, surveys and experiments.

At this stage in the research, the problem has been formulated, research design has been originated, the population has specified our instrument which is secondary data and the sample has been selected. Furthermore, data to be collected has been gathered, which will subsequently be analysed in order to draw a conclusion (Kumar 2014:41). The data was collected from the McGregor BFA database which has been operating since 1965 at the University of Pretoria, was called the Bureau of Financial Analysis and who owns who (wow) website, operational since 1980. Both these systems are JSE portals.

Tuvadaratragool (2013:78) expresses that the financial statements, namely the statement of financial position and the statement of comprehensive income, are the providers of a large number of financial ratios. Service (2013:1067) and Koltz *et al.* (2009:12) agree with Tuvadaratragool (2013) and believes that financial statements are vital and supply an abundance of information. Yet in isolation it cannot give a true reflection of the business. Grossman and Livingstone (2009:31) add that financial ratios are only as reliable as the data used to calculate them. As noted, financial statements are vital, whether it be, for instance, in calculating financial ratios, always being mindful of the inherent flaws financial statements contain. Service (2013:1067) points out these flaws as firstly financial statements using historical amounts, meaning inflation is not reflected meaning that the values are not stable. Secondly, predictive value is limited as included in the definition of assets and liabilities “as

result of a past event". Because of the fact that it results from a past event, it has no relevance on the future.

Service (2013:47) defines asset and liability:

- Asset: *"A resource controlled by an entity as a result of a past event from which future economic benefits are expected to flow to the entity."*
- Liability: *"Present obligation of the entity as a result of a past event, the settlement of which is expected to result in an outflow from the entity of resources embodying economic benefits."*

Thirdly, financial statements do not always report risk in the sense that not all risk is always identified and only limited data or information is disclosed. Finally, the comparability restraints being that the differences in industries and fiscal year result in comparability difficulties, therefore the pairing approach has been applied according to the pairing criteria in order to eliminate these types of comparability obstacles.

Beaver (1966:71) explains a financial ratio as being two proportioned financial statement item numbers. In other words, financial ratios are derived from financial statements. Financial ratios have been around since 33 B.C and they are outcomes from financial statements. The users of financial statements cannot be isolated to a specific stakeholder. These stakeholders use the financial statements for various different reasons. Service (2013:1067) indicates some of the stakeholders and the importance of utilizing the financial statements. Finance providers look into the risk they might come across and the other parties' ability of debt repayment when entering into any transactions with certain entities. Tax authorities' core interest is for tax purposes. Employees' concern is being informed regarding their job security. Directors and management use the financial statements in the decision making and budgeting process. Investors are divided into current investors. They are more concerned with the returns they will receive on their investments and potential investors look at the risk involved if they invest and can compare the risk to the returns if they had to invest in another company.

An analyst evaluates the risk of a company and then compares it to the returns. Auditors have an obligation to give a report regarding the fair presentation of the financial statements and the possible risk of misstatement, misallocations, errors and

fraud. Forecasters forecast or set out feelers for the weak and vulnerable company. Those companies are an easy target for mergers, take-overs or acquisitions at ridiculous prices. Slotemaker (2008:12) explains how forecasters value unhealthy companies by using default forecast. The Failing Company doctrine was also introduced with the aim to alleviate companies from obtaining control over a competitor unfairly from a legal standpoint (Blum, 1974:75). Altman and Hotchkiss (2006:288) state that if it can be proven that the competitors that are trying to merge are connected, either in the market or geographically, and at least one of the companies involved is on the brink of bankruptcy, then the falling doctrine can be enforced.

Hossari (2006:36-37) conducted a study on all studies that relied on financial ratios in predicting corporate failure over a period, 1968-2004. He concluded of the 208 studies conducted, 79% relied on financial ratios. Hossari (2006:49) stated as far back as the early 20th century financial ratios have been useful in analysing financial statements, but only in 1966 did researchers discover financial ratios as being useful in warning of corporate failure. A summary of these studies is illustrated in Annexure 1 attached. Hossari categorized the ratios under:

- Possession – assets as denominator
- Ownership – equity as denominator
- Liquidity – liabilities as denominator
- Performance – sales as denominator
- Peripheral – does not fit into any of the above categories

In pursuing this further, it is found that the financial ratios to be used in the present study correspond with the ratios indicated by Hossari. The financial ratios will be applied as the qualitative factors to ensure they are of importance to this study.

Chen and Shimerda (1981:51) pose a question: “*Over the hundred financial ratios available, which of the financial ratios should be analysed to acquire the data for the task at hand?*” Hossari (2006:53) feels certain financial ratio categories may be more useful in one business sector than in another. He furnished an example to understand his statement better. A specific group of financial ratios that are very useful in predicting failure in the telecommunication sector yet that same group of ratio may not have the same level of usefulness in the health care sector. A summary

of all the ratios per category is done by Hossari (2006:61-76), has been adopted and adjusted for this study by including the ratios that will be employed in this study and in the Emerging Market Score model (EMS) that will be indicated in the Table 3.10 below. The EMS model has been selected as it relies on the above financial ratios.

Table 3.10: Summary of financial ratios per Hossari's category, employed in this study and in Emerging Market Score model

	Ratio	Numerator	Denominator		Ratio	Category	EMS
Possession	C:TA	Cash	Total assets	This Study			
	CA:TA	Current assets	Total assets				
	CF:TA	Cash flow	Total assets				
	CL:TA	Current liabilities	Total assets				
	EBT:TA	Earnings b4 tax	Total assets				
	EBIT:TA	Earnings b4 interest & tax	Total assets				X (x3)
	FA:TA	Fixed assets	Total assets				
	LTL:TA	Long-term liabilities	Total assets				
	NI:TA	Net income	Total assets				
	QA:TA	Quick assets	Total assets				
	RE:TA	Retained earnings	Total assets				X (x2)
	S:FA	Sales	Fixed assets				
	S:TA	Sales	Total assets		X	Asset management	
	TE:TA	Total equity	Total assets				
	TL:TA	Total liabilities	Total assets		X	Debt management	
	EBIAT:TA	Earnings b4 interest after tax	Total assets		X	Profitability	

	Ratio	Numerator	Denominator		Ratio	Category	EMS
	WC:TA	Working capital	Total assets				X (x1)
	C:TA	Cash	Total assets				
	CA:TA	Current assets	Total assets				
Ownership	CL:TE	Current liabilities	Total equity	This Study			
	EBIT:TE	Earnings b4 interest & tax	Total equity				
	FA:TE	Fixed assets	Total equity				
	LTL:TE	Long-term liabilities	Total equity				
	NI:TE	Net income	Total equity		X	Profitability	
	S:TE	Sales	Total equity				
	TL:TE	Total liabilities	Total equity		X	Debt management	
Liquidity	C:CL	Cash	Current liabilities	This Study			
	CA:CL	Current assets	Current liabilities		X	Liquidity	
	CF:CL	Cash flow	Current liabilities				
	CF:TL	Cash flow	Total liabilities		X	Cash Flow	
	MVE:TL	Market value of equity	Total liabilities				
	QA:CL	Quick assets	Current liabilities		X	Liquidity	
	TE:LTL	Total equity	Long-term liabilities				
	TE:TL	Total equity	Total liabilities				X (x4)

	Ratio	Numerator	Denominator		Ratio	Category	EMS
Performance	C:S	Cash	Sales	This Study			
	CA:S	Current assets	Sales				
	CF:S	Cash flow	Sales				
	EBIT:S	Earnings b4 interest & tax	Sales		X	Profitability	
	Inv:S	Inventory	Sales				
	NI:S	Net income	Sales		X	Profitability	
	QA:S	Quick assets	Sales				
	WC : S	Working capital	Sales				
Peripheral	AR:S	Accounts receivable	Sales /365	This Study	X	Asset management	
	EBIT:I	Earnings b4 interest & tax	Interest		X	Debt management	
	Inv:WC	Inventory	Working capital				
	S:Inv	Sales	Inventory		X	Asset management	

Source: Hossari (2006:61-76) adjust for this study

In order to carry out the quantitative analysis, the ratios to be applied to the failed and non-failed companies are indicated in Table 3.10 above and will be discussed and better understood in more detail in Chapter 4.

3.6 DATA ANALYSIS

Data analysis is when reasoning is applied in order to understand the data that has been gathered (Zikmund *et al.*, 2013:68). Grove *et al.* (2012:46) point out that the purpose of analysing data is to reduce, organize and give meaning to the data. In the data collection process, basically only the data needed to carry out the analysis was gathered; irrelevant data was removed (Brynard *et al.*, 2014:62). Mouton (2011:108) is of the opinion that data analysis is to split up data into smaller manageable elements with the aim to understand the data. Tuvadaratragool (2013:81) makes known that earlier studies by Beaver (1966) and Blum (1974) utilized comparative ratio analysis and trend analysis techniques as their analytical approach. This study will adopt the same techniques as Lucouw (2013:71) points out it is of little use when comparing financial ratios of prior years or similar companies if there is no known benchmark. This study will also include the Emerging Market Score (EMS) model. Of the 46 financial ratios 44 adopted from Hossari (2006:61-76) in addition (Earnings before interest after tax / Total Assets) and (Quick Asset / Current Liabilities) were included. Only certain financial ratios that fall under the five major categories which consist of the most frequently used in the group of 46 financial ratio totaling 13 financial ratios and the four financial ratio of the Emerging Market Score Model that will be applied in this study will be defined totaling 17 selected ratios. The ratios that will be utilized in this study are indicated by Correia *et al.* (2011:5.38–5.39) as the ratio for industry sector of South Africa compiled by ABSA and computed by the Bureau of Financial Analysis. Major categories are i) Debt management also referred to as solvency or financial leverage ii) Operating cash flow iii) Liquidity, iv) Asset management also known as market performance, activity ratio or turnover ratios finally profitability. Smart and Graham (2012:41-46) describe the categories of the 17 financial ratios (including EMS) this study will employ of the 46 ratios.

3.6.1 Debt Management

Service (2013:1072-1073) explains that because a company uses different sources of funding internally and externally, funds namely debt and equity, this category

indicates how safe the company debt structure is. If the company has more debt, it is a cheaper form of debt due to the tax benefit the company is able to receive from the South African Revenue Service (SARS). Yet finance through debt carries a higher risk because whether the company is making a profit or not, they are legally obligated to repay capital plus interest. Equity is a more expensive form of finance due to there being no tax benefit but the risk is lower. If the company does not make a profit, it is not obligated to repay any money because it was financed with its own funds.

Equation 3.1: Debt Ratio

$$DR = \frac{\text{Total Liabilities}}{\text{Total Assets}} \quad (3.1)$$

This ratio is equal to total liabilities divided by total assets. It indicates how much of the assets are financed externally (Service, 2013:1088), gives a clue as to how dependent a company is on external (debt) funding. Correia *et al.* (2011:5.16) claims: the higher the debt ratio, the higher the financial risk.

Equation 3.2: Debt to Equity Ratio

$$D2E = \frac{\text{Total Liabilities}}{\text{Total Equity}} \quad (3.2)$$

Service (2013:1088) explains that this ratio indicates how much of a company's finance or funding is internally (equity) in correlation to externally (debt). The ratio is calculated by dividing total liabilities by total equity. The higher this ratio is the greater the risk of the company.

Equation 3.3: Interest Coverage

$$\text{Interest coverage} = \frac{\text{EBIT}}{\text{Interest}} \quad (3.3)$$

The ratio is determined by dividing earnings before interest and tax, by interest and measures the amount of times interest can be repaid. The higher the ratio, the greater the ability of interest being repaid. Correia *et al.* (2011:5.17) believe this ratio can measure how far earnings can drop before resulting in financial loss for the company.

3.6.2 Operating cash flow

This is the lifeblood of any company, according to Correia *et al.* (2011:5.19). If the cash flow is insufficient, a company will be unable to meet its future obligations,

which in turn could lead to failure. Research has found that cash flow to total debt ratio is trustworthy when a company wants to indicate company failure and is a good indicator of how stable a company is.

Equation 3.4: Cash Flow to Total Debt Ratio

$$\text{Cash flow to Total debt} = \frac{\text{Cash flow from operations}}{\text{Total debt}} \quad (3.4)$$

This ratio is calculated by taking the cash flow from operations divided by total debt. Correia *et al.* (2011:5.19) affirm the total debt associated with the cash flow generated from trading activities is measured by this ratio. Koen and Oberholster (1999:22-23) affirm that cash available from operations is seen as a crucial amount and the three cash flow components (namely investing, financing and operating activities) are just the starting point of analysis of the cash flow statement. Analysis should be built only on cash available for normal operations; abnormal items should be removed, as cash available from operating activities includes abnormal items, but excludes extraordinary items. Smart and Graham (2012:35) simply stated operating cash flows as the cash a company produces from its operations.

3.6.3 Liquidity

Smart and Graham (2012:41) explain that in this category the companies' ability to repay their short term obligations will be measured as they become due and it is a good cash flow problem indicator. In this study a group of three ratios will be subjected to this category. Marx and De Swart (2013:72) state it is a means used to acquire the financial state of a company through financial information on a company's ability to repay its accounts. Grossman and Livingstone (2009:19) indicate it can answer the question as to whether a company can survive.

Equation 3.5: Current Assets Ratio

$$\text{Current Assets} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (3.5)$$

This ratio is calculated by dividing the current assets by the current liabilities. It indicates whether a company can meet their current obligations or not. A higher ratio is better. When a strong ratio is obtained, it is evident that the chances or ability of the company to pay their current obligations is good when the current assets are more than the current liability (RMA, 2011:14).

Equation 3.6: Quick Asset Ratio

$$\text{Quick Assets} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \quad (3.6)$$

The ratio is computed by deducting inventory (least-liquid current assets) from the current assets, divided by current liabilities. It measures if a company can meet its current obligations without inventory. When the ratio is less than 1:1, it reflects the company as being dependent on inventory or other less liquid current assets (RMA, 2011:14).

Equation 3.7: Working Capital Ratio

$$\text{Working Capital} = \frac{\text{Working capital}}{\text{Total Assets}} \quad (3.7)$$

This ratio is equal to working capital divided by total assets. Service (2013:1085) says the liquidity portion of the total assets is indicated by this ratio. Working capital is simply explained by subtracting the current assets from the current liabilities. X_1 of the Emerging Market Score model is portrayed by this ratio.

3.6.4 Asset Management

An indication of how effective a company's assets are used is the momentum at which amounts are converted into cash (Smart & Graham, 2012:42). Grossman and Livingstone (2009:21) agree and add that the faster assets are turned over, the more business the company can do without increasing assets; resulting in less cash being tied up in assets. Block *et al.* (2009:57) state this category measures the number of times a company can sell assets or collect all their accounts receivables in a year.

Equation 3.8: Inventory Turnover Ratio

$$\text{Inventory turnover} = \frac{\text{Sales}}{\text{Inventory}} \quad (3.8)$$

The speed or number of times a company sells their goods is measured, defined as sales (cost of sales can also be used) divided by inventory (RMA, 2011:15). When there is a high turnover of inventory it could be an indication of extensive liquidity. However, it can also indicate an inventory shortage for needed sales. Low inventory turnover can be a sign of poor liquidity, possible overstocking or obsolete inventory.

On the other hand, it could point out good planning for inventory accumulation in case of material shortages.

Equation 3.9: Total Assets Turnover Ratio

$$\text{Total asset turnover} = \frac{\text{Sales}}{\text{Total Assets}} \quad (3.9)$$

It indicates how efficient the company is when using all their assets to generate sales. The ratio is determined by dividing sales by total assets. A higher ratio is desired by analysis, as investors receive more cash flow because it indicates that the company is creating sales. Total assets include fixed assets and RMA (2011:19) advises that the largely depreciated assets or operations that are labour intensive, can be misrepresented.

Equation 3.10: Accounts Receivable Turnover Ratio

$$\text{Account receivable turnover} = \frac{\text{Accounts receivable}}{\text{Sales}/365} \quad (3.10)$$

Correia *et al.* (2011:5.14) explain this ratio is used to calculate accounts receivable by dividing accounts receivable by average sales per day (sales/365). It measures the average time it takes for the collection of the accounts receivables. It is a determination of how long the company must wait for their payment (cash) after making a sale.

3.6.5 Profitability

This category indicates how effective and efficient company operations are and whether the company is using their funds wisely (Brigham & Ehrhardt, 2007:449). Service (2013:1071) indicates that this category mandate is based on decision making and policies. Grossman and Livingstone (2009:26) state this group of ratios allows a company to survive, to grow and alternatively prosper when favourable.

Equation 3.11: Net Operating Profit Margin Ratio

$$\text{Net operating profit margin} = \frac{\text{EBIT}}{\text{Sales}} \quad (3.11)$$

A measure of the percentage left per rand after all costs and expenses have been deducted, excluding interest and tax. This ratio is equal to earnings before interest

and tax divided by sales. A high percentage is favourable, as stakeholders can see the operating profit before the payment of tax and creditors.

Equation 3.12: Net Profit Margin Ratio

$$\text{Net profit margin} = \frac{\text{Net Income}}{\text{Sales}} \quad (3.12)$$

This ratio measures the percentage per rand after all costs and expenses have been deducted including interest, tax and dividends (preferred). It is calculated by dividing the net income by sales.

Equation 3.13: Return on Assets Ratio

$$\text{Return on assets} = \frac{\text{EBIAT}}{\text{Total Assets}} \quad (3.13)$$

It is an indication of how effective management used the assets of a company to produce a return for their shareholders. According to Vigaro (2008:236), this ratio determines the effectiveness of the investment in assets in assisting a company in generating profit. Performance is based on the level of the ratio, meaning the higher the level, the better the company performed. Computation of this ratio is equal to earnings before interest and after tax, divided by total assets. Altman (2002:11) affirms that this ratio is suitable when concerned with credit risk because the earning power of a company is the basis of its existence and this ratio measures the productivity of a company's assets.

Correia *et al.* (2011:5.18-5.19) explains this ratio measures how profitable a company is holistically in relation to its total assets employed. This study will apply the above ratio as this ratio can be computed by dividing i) EBIT, ii) net profit and iii) EBIAT by total assets.

i) $\frac{\text{EBIT}}{\text{Total Assets}}$ is useful when analysis is done of companies in different taxation situations and will also be used in this study as this ratio represents X_3 in the Emerging Market Score Model.

ii) $\frac{\text{Net Profit}}{\text{Total Assets}}$ is after interest and taxation. Financial leverage will have an influence on ROA as the returns are understated because after-tax cost of debt finance has not been removed, therefore it is not the best option to use.

- iii) $\frac{\text{EBIAT}}{\text{Total Assets}}$ will be applied in this study as Correia *et al.* refer to it as the “*most correct approach*”. Interest is excluded which is a cost of finance and taxation is included, which is operating cost.

Equation 3.14: Operating Return on Assets Ratio

$$\text{Operating return on assets} = \frac{\text{EBIT}}{\text{Total Assets}} \quad (3.14)$$

This ratio gives an indication of an earning-generating capacity from assets of a company (Tuvadaratragool, 2013:86). Correia *et al.* (2011:5.19) explain that this ratio is computed by dividing the earnings before interest and tax by total assets and the aim is to determine the profitability of the company relative to the assets.

Equation 3.15: Return on Equity Ratio

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Total Equity}} \quad (3.15)$$

The portion of the profit generated by the company that belongs to the shareholders is demonstrated by this ratio (Vigaro, 2008:238). It is calculated by dividing net income by total equity. It is evident that the company has given the shareholder a higher profit per rand when this ratio increases. Basically determine how effective managements use the funds to create a return on the shareholders (owners) investment.

Equation 3.16: Retained Earnings to Total Assets Ratio

$$\text{Retained earnings/Total assets} = \frac{\text{Retained Earnings}}{\text{Total Assets}} \quad (3.16)$$

Altman (2002:11) describes retained earnings as the total amount reinvested or lost by a company over its lifetime. A measure of the proportion of internally accumulated resources a company utilizes and equals to retained earnings (internally accumulated funds) divided by total assets. The higher the ratio, the more favorable it is as it is a sign that more earnings can be retained by the company (Tuvadaratragool, 2013:86). This ratio represents X_2 in the Emerging Market Score Model. Altman (2002:11) believes a company has not used a great deal of debt, but retained their profits to finance their assets, indicated by a high ratio.

Equation 3.17: Total Equity to Total Liabilities Ratio

$$\text{Total equity/Total liabilities} = \frac{\text{Total Equity}}{\text{Total Liabilities}} \quad (3.17)$$

This is the inverse of the debt to equity ratio, calculated by dividing total equity by total liabilities. Tuvadaragool (2013:87) affirms that this ratio also forms part of one of the EMS model and signifies X_4 of the EMS model. It measures how reliant a company's operations are on funds borrowed externally and internally.

3.7 RATIO ANALYSIS

3.7.1 Comparative Ratio Analysis

According to Marx and De Swart (2013:66), comparative ratio analysis is when different companies are compared with each other at the same time to give an indication of a company's financial condition. This approach is known as the benchmark approach, as companies are curious to know how they are performing financially in relation to their competitors and points analysts in the direction of potential areas of concern. Brigham and Ehrhardt (2007:14) referred to the comparison of financial ratios of companies to their industry equals or higher ranked, as benchmarking. By performing the comparison, a company's strength and weaknesses can be determined. Tuvadaratragool (2013:91) explains that not all ratios will indicate a company's strength or weakness, but certain ratios will indicate either the strength or weakness of a company. He identifies that a high current ratio, return on assets and return on equity will be an indication of a company's strength. However, a high debt to equity, total debt to total assets and operating ratio signal a company's weakness.

According to Tuvadaratragool (2013:90), because this technique can be applied within or among companies, the results differ, depending from which point of view they are looked at. From the perspective within a company, this technique will indicate if the company is making a profit or a loss, whether the company's assets are managed effectively, if the company has sufficient funds to repay their current and long-term commitments and whether the shareholders are attaining or losing from their investment. From the perspective among companies the question is whether the company's performance is better or worse than that of their competitors within the same industry. Vigario (2008:232) explains that in order to perform this

technique, the financial results needs to be recorded over a preferred period, for instance five – ten years. The trends are identified, which enables forward forecasting to be made by scrutinizing the changes over the years.

Garrison *et al.* (2012:680) believe when utilizing this approach, it needs to be kept in mind for any lack of comparability, for instance accounting treatment differences, size and fiscal years between companies. This study will use 13 ratios to apply the comparative ratio analysis.

3.7.2 Ratio Trend Analysis

Firminger (2003:2) informs us that there are different kinds of trend analysis namely historical trend analysis, content analysis and cyclical pattern analysis. In this study the historical trend analysis will be utilized. According to Brigham and Ehrhardt (2007:464), the ratios will be plotted over our period of study as this technique gives an indication whether a company's condition has improved or weakened over time.

Correia *et al.* (2011: 5.9) are in agreement and state that trend analysis give clues as to the direction of change a company is heading to and this is only possible if a number of years' financial information is available. Companies' profits fluctuate annually. So using only one year's financials will not give a clear picture of the company. So trend analysis is applied to determine whether the trend of a company is moving upward or downward. However, doing a trend analysis is not enough. Lucouw (2013:71) states that not much information is attached if a trend analysis is without a reference base and in the case of a rising trend it is not always favourable. Block *et al.* (2009:63) concur and believes if there is no benchmark available the trend analysis will not provide a complete picture. In this study the non-failed group of companies will be the benchmark against which the failed group of companies will be compared.

Tuvadaratragool (2013:92) is of the opinion even though this technique can be used in different disciplines or fields of study like education, politics, health, business planning and consumer behaviour, it is not so sought after as ratio analysis. If applied with other methods, it is more powerful. Vigario (2008:232) called this technique the most informative and his statement is based on his belief that this technique has the ability to analyse a company's financial position and every part thereof.

Marx and De Swart (2013:67) propose when a company's financial performance is evaluated over a period of time, economic and environmental changes need to be account for as well. Like with in comparative ratio analyse 13 ratios will also be used out of the 17 ratios adopted when applying this technique. The starting point of assessing companies' status in comparison to other amounts from other years will be the first year of the five years and will be referred to as the base year. The reason why the EMS is used in the current study is because South Africa forms part of the emerging market and the BRICS countries therefore the Altman's EMS was selected.

3.7.3 Emerging Market Score Model (EMS)

The emerging market score model is a modification credit scoring model from the original Z-Score model that was developed in 1968 by Altman. The aim of this model was to accommodate non-manufacturing and privately owned companies because the Z-Score credit scoring model was developed to only meet the requirements of manufacturing and publicly held companies (Altman 2005:311).

Altman (2002:7-15) explains in earlier years a company's creditworthiness was determined using a rating, in 1849 Dun and Bradstreet Inc. known as the forerunners of this credit rating. The credit scoring model was built to estimate a certain level of risk. The rating AAA would be equivalent to 5.0 Z-Score in the safety zone (>2.99) and B would be similar to 1.70 Z-Score in the distress zone (<1.81).

Altman and Hotchkiss (2006:265–266) outlines that the EMS model was developed in 1990s with the aim to analyse emerging market companies using bonds (credit rating). The improvement of the Z-Score model is the foundation on the Emerging Market Score's models and has been modified on the following basis. Firstly, the unguarded currency devaluation, secondly the affiliations of the industry and finally the industries' competitive position and the rationale of the modifications is to subsequently compare the actual bond rating to that of the resulting analyst modified rating.

Altman (2002:24-27) better explains the usefulness of the EMS model using the Enron and World com crashes saga's. Enron's rating in 1999 was AAA by the rating agencies and the model indicated it to be BBB. The 2001 rating agency rated it at BBB then it declined to B- then CCC+ before filing for bankruptcy. The model indicated B in 2001 already to be a signal of distress and to make matters worse, this

rating was based on misrepresented liabilities and not the true liabilities estimated to be \$60 billion. World com's liabilities when they filed for bankruptcy totalled \$43 billion. The rating agency gave then a rating of A- at year end 2000-2001; the model indicated it to be at BB-, downgraded from BBB+ in 2001 to BB in 2002 and to CCC just before bankruptcy. The EMS Model signalled the rating to be 1.66 in 2002 which is represented by a D on the list of the credit scoring (Altman and Hotchkiss, 2006: 268). The EMS was applied as a foundation in the study of Altman and Hotchkiss and adjusted for an emerging corporate bonds scoring system, meaning the variables (financial ratios) and weightings used, remain the same. Only the EMS zones will differ to meet the needs of the different studies as it is a promising corporate market framework.

i) The variables included in the EMS are as follows: Equation 3-18 EMS Model

$$Z = 3.25 + 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4 \quad (3.18)$$

Where:

X_1 = working capital / total assets

X_2 = retained earnings / total assets

X_3 = earnings before interest and taxes / total assets

X_4 = book value of equity / total liabilities

ii) EMS = overall index or score. : Credit scoring system for corporates

Discrimination zones

Safe zone: $EMS > 5.85$

Grey zone: $4.15 < EMS < 5.85$

Distress zone: $EMS < 4.15$

iii) Rating overall index zones

Safe zone: $> 8.15 - 5.85$

Grey zone: $< 5.85 - 4.15$

Distress zone: $< 4.15 - < 1.75$

iv) EMS = overall index or score. : Emerging markets (original)

Discrimination zones

Safe zone: $EMS > 2.60$

Grey zone: $1.10 < EMS < 2.60$

Distress zone: $EMS < 1.10$

The original EMS model will be applied in this study. As previously mentioned the EMS falls under the MDA umbrella and chapter 2 concludes that the MDA is a well sought after method. In the next section, the difference between the univariate and the MDA models and the importance of the MDA will be stated.

3.7.4 Univariate and MDA Models

Argenti (1976:138) does not dispute that ratios have the ability to detect if something is wrong, yet doubts that a ratio on its own could be a predictor of company failure or collapse. Balcaen and Ooghe (2006:65-81) explain the univariate discriminant analysis model which Beaver (1966) pioneered and developed (ratios are analysed one at a time), requires no statistical familiarity and is referred to as being extremely simple. Altman (1968:591-592) overcame the shortcomings of the univariate analysis by introducing the multiple discriminant analysis. MDA aims to develop a linear combination of attributes that can best differentiate between groups. This is done by utilizing a statistical technique that categorizes a single observation into quite a few groups that rely on the observations independent attributes. Mosalakae (2007:49) simply states MDA is when discrimination is made between failed and non-failed companies.

Balcaen and Ooghe (2006:66-82) agree with Altman (1968) that the MDA is the most sought after method and continues by stating both the univariate and the MDA comply with the classification rule when the company's financial health status is determined, depending on whether it is above or below the discriminant score.

3.8 CONCLUSION

Bless *et al.* (2013:56–57) claim research can be classified in four ways. Firstly according to methodology used which is qualitative, quantitative or mixed method. The author has pointed out that the method to be employed in this study is the mixed

method. Secondly, according to the aim or reason of the study, it can be basic which means: aiming to obtain human understanding and applied, which aims to solve a specific problem faced by a group. Thirdly it is based on primary or secondary data. This is connected to the data collection and an indication was made in the study that secondary data will be used. Finally it is centred on the demands of the research namely descriptive, explanatory and exploratory, which we have identified as the method to be applied in this study.

The aim of this chapter was firstly to identify the study problem and describe how the problem was formulated. The research covered the purpose for choosing the exploratory research and the method we used was secondary data. Secondary data's pros and cons were highlighted and it was concluded that this complies with the validity and reliability needed.

The target population and the sample to be utilized in this study were pointed out, indicating the criteria used to select the sample. Data was collected from a reputable database McGregor BFA, which is a JSE portal. The inclusion of a controlled group being non-failed JSE Top 40 index companies, was to ensure validity of findings. The analysis of data will be run through two traditional analysis methods namely comparative ratio analysis and ratio trend analysis, in addition to applying the Emerging Market Score Model (EMS).

In Chapter 4 the data collected will be analysed and interpreted by means of the traditional analysis known as ratio trend analysis and comparative ratio analysis, followed by the assessment of the EMS model per industry over five consecutive years under investigation.

CHAPTER 4

DATA ANALYSIS

4.1 INTRODUCTION

Zikmund *et al.* (2013:68) refer to data analysis as applying reason in order to understand the relevant gathered data in the simplest form to aid in drawing a conclusion. Mouton (2011:108) maintains the intent of data analysis is to analyse raw data in order to understand it. This entails data being broken up into manageable forms. Focus in this chapter will be to pay attention to detail. The input recording should be appropriate in order to acquire an output that is appropriate. A commonly used phrase in many disciplines is “GIGO”, meaning garbage in results in garbage out. Zikmund *et al.* (2013:459) explain that if data is collected incorrectly and entered poorly, the results or conclusion will be inadequate. In this chapter, the raw data being unedited data collected in chapter 3, will be transformed into intelligence (Zikmund *et al.*, 2013:459).

The aim of this chapter is to analyse and discuss the findings of the data collected in chapter 3. The methodology mentioned in chapter 3 will be applied to the sample described in order to acquire outcomes or meet the primary, secondary, theoretical and empirical objectives mentioned in chapter 1.

This will be followed by defining what descriptive statistics are and presenting the results of descriptive statistics that have been applied, using this study’s sample data. A univariate analysis will be applied and the results will be discussed. Subsequently the comparative ratio analysis and ratio trend analysis will be administered and the results will be examined. Thereafter, the EMS model will be exerted and the outcome analysed.

4.2 SAMPLE USED

The sample selected in this study was based on the claims by Norton and Smith (1979:73). It is consequential that a failed group of companies (delisted companies) was identified and matched to a non-failed group of companies. The non-failed companies were selected from the JSE Top 40 index companies, which excluded the mining and financial industry as well as any industries which were not affected by bankruptcies

during the specified period of the study. Pairing between the failed and non-failed companies was done according to industry, fiscal period and closest asset size.

Sample has been grouped into two groups. After the criteria of the sample selection have been met, as indicated in chapter 3 (par 3.4.2), a summary in table 4.1 is given below.

Table 4.1: Summary of sample and sample selection criteria

	Failed	Non-Failed	Pairing
Companies	n = 8	n = 8	n = 16
Criteria Ranking	Delisted (2007-2012)	Listed (JSE Top 40)	-
Industry	Excl.:Mining + Financial	Excl.:Mining + Financial	Same industry
Reason	Bankruptcy	-	-
FSD	Five year before failure	Same fiscal years	Same fiscal years
Asset size	-	-	Closest asset size

Source: Own research

Table 4.1 above indicates the number of companies within the sample and the sample selection criteria used as indicated in chapter 3 (par 3.4.2). An indication of when the JSE Top 40 index companies were founded and the companies forming part of the sample have been clearly marked in Annexure 2.

Tuvadaratragool (2013:70) states that both failed and non-failed groups of companies are needed to be able to investigate whether financial statement data have the ability to predict failure.

4.3 PROFILING

4.3.1 Financial Statements

As previously mentioned in prior chapters, financial statements can be used by different users with different intentions. These intentions can be tailored to derive a targeted outcome as the users can convert the data they have into useful information by using

different financial statement data. For instance, a statement of financial position - SOFP (known as balance sheet) amounts can be divided by a statement of comprehensive income- SOCI (known as the income statement) amount or by a statement of financial position – SOFP amount with the aim or expectation to get clarity on totally different situations. For example, in order to compute the liquidity of a company a SOFP amount is divided by a SOFP amount and in the computation of profitability of a company, a SOFP will be mostly divided by a SOCI amount.

Gouws and Lucouw (1999:100-107) put in plain words that the background of the environment from which the numbers are drawn and the relationship between the numbers and the existing economy, need to be understood for the information to be significant and meaningful, as financial data is complicated in itself because it might comprise of embedded meanings. Not many numbers in accounting are consequential in themselves and understanding is only gained when those amounts are in relation to other amounts, and data is converted into knowledge.

Gouws and Lucouw (1999:108) continue by stating “The first and most important function of financial statement analyses within the decision making process is to convert data into meaningful relationships, expressed as ratio. This process also called the life after financial statement - can be used as a

- preliminary screening tool in the selection of investment opportunities /merger candidates
- forecasting tool of future stock prices, financial conditions and risk and performance
- diagnosis of managerial and management strategy
- benchmarking tool
- cognitive help to reduce reliance on pure hunches, guesses, and intuism, and thus reduces and narrows the inevitable areas of uncertainty that attend all decision making processes”.

Gouws and Lucouw (1999:107) elucidate a sought after company analyzing tool that was and still is the accounting and financial ratios. Financial statement data will be drawn five years prior to bankruptcy or based on the availability of the financial data over a five years period before bankruptcy. The financial data order does not have to be consecutive. The importance is that it has to be over a five year period. The data for

both the delisted group of companies and the controlled group has been collected for the same time period. The selection of five years before bankruptcy is based on prior studies conducted by the likes of Beaver (1966) and Hamer (1983:295), stating that the usefulness of predicting failure through financial ratios can be said to be five years before the occurrence of the failure. The guideline of the financial statements data to be drawn for this study for the year of delisting is as follows:

- 2007 : financial statements data drawn 2003 -2007
- 2008 : financial statements data drawn 2004 -2008
- 2009 : financial statements data drawn 2005 -2009
- 2010 : financial statements data drawn 2006 -2010
- 2011 : financial statements data drawn 2007 -2011
- 2012: financial statements data drawn 2008 -2012

However, if financial statement data is not available for the above period, financial statement data will be drawn for any consecutive five years before delisting and this data should be available for both failed and non-failed groups.

4.3.2 Financial Ratios

Hossari (2006:31) indicates that incompatibility of data is reduced by the use of financial ratios. Barnes (1987:449-453) explains that assumptions have been made that because ratios have suitable statistical properties, it can handle and sum up data. The usefulness of the ratios may differ, for instance the current ratio of a failed company might be more useful in the circumstances of a company than in an industry as a whole.

Of the many financial ratios that can be evaluated from financial statement data, the financial ratios needed to assist in acquiring the necessary information to enable the analysis of data have been identified in table 3.10 of chapter 3 as 46 financial ratios. The 44 financial ratios have been identified in the study conducted by Hossari (2006:61-76), adjusted and adopted for this study. The financial ratios are calculated on financial statement data available from the McGregor BFA database. Financial ratios for the period 2007 – 2012 were calculated in order to compare companies within the same industry, failed with non-failed. Liquidity ratios, the current and quick ratios will be computed, including working capital of the EMS model. Profitability ratio will cover net

profit margin (%), net operating profit margin, return on assets, return on equity and for EMS model, net return on assets, retained earnings to total assets and total equity to total liabilities. Asset management represents inventory turnover, total assets turnover and accounts receivable turnover, debt management over debt ratio, debt to equity and interest cover and cash flow which look at cash flow to debt.

If observed during the data analysis process that there are absent financial statement data that are needed to compute the ratios, those ratios will be indicated and excluded. The exclusion will have an impact on the univariate analysis, as well as the comparative ratio analysis, the ratio trend analysis and the EMS model, as these analyses are based on financial ratios.

4.3.3 Companies

The sample that will be analysed is 16 companies of which eight are a failed group of companies and eight non-failed group companies for the period 2007 to 2012. Of the total failed group of companies in the sample, four companies were delisted in the consumer goods industry, two delisted in the consumer services industry, two in the industrial industry and zero in each of the following industry: health care, telecommunications, oil and gas, basic resources, chemicals, technology industry and the utilities industry for the period (2007-2012). In 2007 the following companies delisted: one in the consumer goods industry, two in the consumer services industry. In 2008 there was no delisting included in the sample. In 2009 four companies in total were delisted in that particular year, of which three were in the consumer goods industry and one in the industrial and none in the consumer service industry. No companies were delisted in the 2010 and 2011 fiscal year in all three industries. In 2012, one company was delisted in the industrial industry.

4.3.4 Assets Size

Due to the vast difference between the failed and non-failed group of companies years of existence, it is expected that an immense dissimilarity will also exist in the assets sizes. Therefore the asset size is one of the least important criteria. The differences have been illustrated in Table 4.2 below of the assets sizes per industry.

Table 4.2: Companies within samples' asset size range.

	Failed Companies		Non-Failed Companies		
Industry	Number of Companies	Asset Size	Number of Companies	Asset Size	Range
Consumer Goods	4	R21 872 160	4	R40 423 976	R 22 000 000 – R 41 000 000
Consumer Services	2	R5 818 762	2	R38 846 557	R 6 000 000 – R 39 000 000
Industrial	2	R1 520 132	2	R1 088 108	R 1 000 000 – R 1 600 000

Source: McGregor (2014) adjusted for own research

4.4 DESCRIPTIVE STATISTICS

In previous studies conducted by Beaver (1966), Altman (1968), Edmister (1972) and Blum (1974), the sample's financial characteristics were described by using descriptive statistics. The sample is failed listed JSE companies during the 2007 to 2012 period. Descriptive statistics used in this study include the mean as the measure of central tendency. The underlying reasons for choosing these measures are that extreme values and data dispersion are taken into consideration, and that these are the most frequently used measures in the literature (Tuvadaratragool, 2013:9).

According to Davis (2005:230), statistics are used to describe the summary of the of sample given data. Babbie (2013(a):82) refers to statistics as a summarized description within a sample of a variable whereby the population parameters are anticipated. Leedy and Ormrod (2014:10) explain data that is received is normally unorganized or it is in bits of information. Statistics provide ways of converting the chaos of the information into order. Statistics assist by describing and drawing inferences from data. Black (2013:13) describes statistics as data-gathering, analysing, interpreting and presenting numerical data that is an important decision-making tool. Statistics are separated into categories that are descriptive statistics and inferential statistics. Maree (2013:183) defines descriptive statistics as a statistical method used to compress data in a way that is relevant by organizing and summarizing data of a population. Black (2013:13) concurs and adds descriptive statistics result from data gathering of a population and a conclusion is made only on that population. Neuman (2006:347) states when

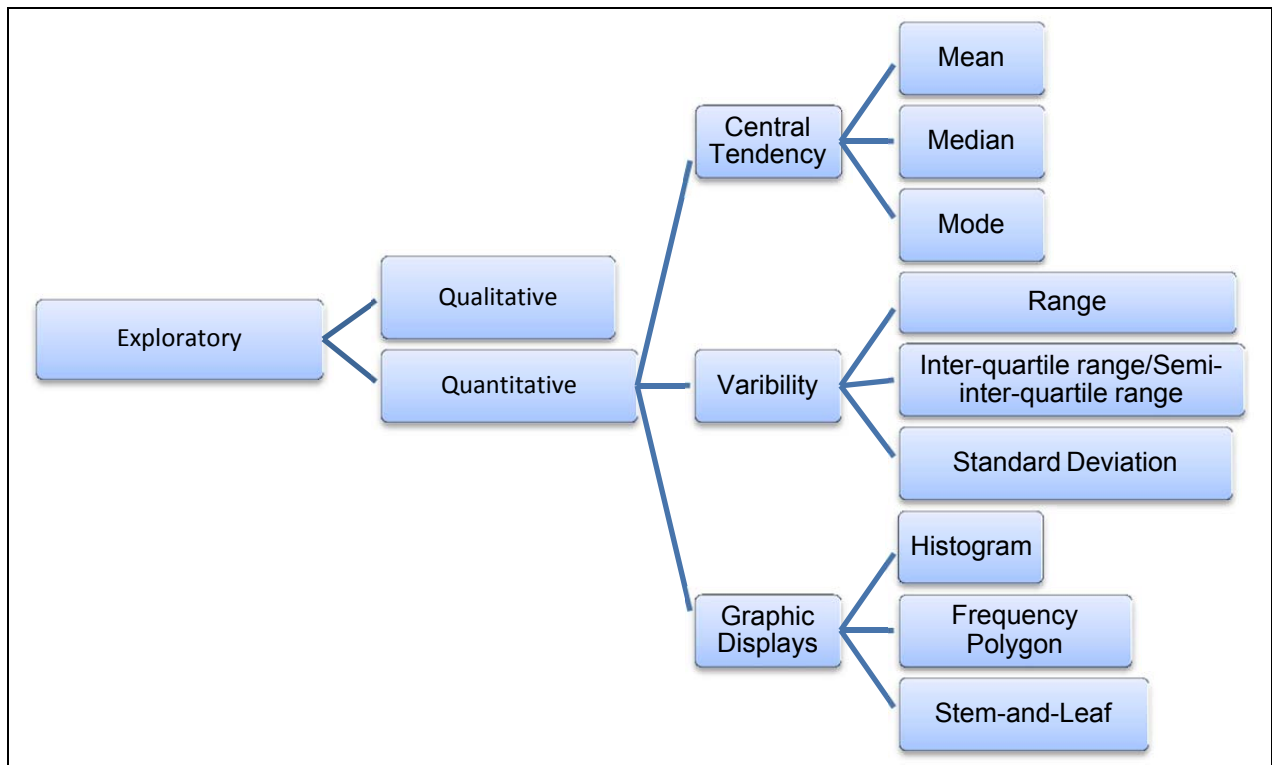
researchers want to describe basic data patterns, descriptive statistics will be used. Therefore it can be said that the raw data collected is organized in such a way that it is consequential to enable the researcher to understand the characteristics of the data (Maree, 2013:183). Inferential statistics is used by Maree (2013:198) when samples of data findings are used to conclude or make a statement on the population. Fox and Bayat (2007:125) explain descriptive statistics is more a description, while hypotheses' are tested to determine if sample results can represent the whole population that is called inferential statistics. Black (2013:6) asserts that inferential statistics is used when something is inferred about the population, using data collected from the sample.

Babbie (2013(a):238) explains that quantitative analysis involves the analysis of variables and it may vary from one, two up to numerous variables. Bless *et al.* (2013:283) say when a single sample is analyzed in the descriptive statistics process it is called univariate, when two variables are analysed it is bivariate and multiple variable analysis is known as multivariate analysis. The univariate analysis is basically for description purposes and is hypothesis testing using only one variable (Zikmund *et al.*, 2013:507). Babbie (2013(a):243) refers to this analysis as the simplest quantitative analysis. Bivariate analysis is interpreted by Zikmund *et al.* (2013:507) as hypothesis testing that involves two variables. Babbie (2013(a):252) states that the aim of this analysis is to determine the empirical relation between variables and is an instantaneous analysis of two variables. Multivariate analysis is when three or more variables or groups of variables are involved in the hypothesis testing (Zikmund *et al.*, 2013:507). Babbie (2013(a):256) plainly explains this analysis type as numerous variables analyzed concurrently.

Maree (2013:183) identifies two ways descriptive statistics can be portrayed, numerically or by graphical representation. It also consists of different data types with the intention of using different ways to describe the properties; these types are qualitative and quantitative. The data type to be used in this study is the exploratory quantitative study. Quantitative data split to i) location or central tendency; ii) spread or variation and iii) shape or form. Dane (2011:84) refers to iii) as graphic displays. Black (2013:53) made known central tendency is a measure in which a set of data are described and produce information about the midpoint of a group of numbers. Measurement is presented by mode, median and mean, and give more complete numerical data. Variation measures describe the layout of a dataset, measures are

conducted through ranges, interquartile or semi-interquartile range and standard deviation. Shape measures describe the shapes of the data distributed. Dane (2011:84) illustrates in the Figure 4.1 below the kinds of analysis that are appropriate when applying exploratory research, the same research type that is employed in this study.

Figure 4.1: Suitable analysis for exploratory research



Source: Adopted from Dane (2011:84)

Figure 4.1 it illustrates that by using the exploratory research type, the point of commencement will be with the qualitative aspects and then followed by the quantitative aspects.

The mean is described by Bless *et al.* (2013:258) as the central tendencies' most accurate measure, as it uses all values of the distribution. The distribution is affected by two extreme values. Tuvadaratragool (2013:107) implies that the critical contributor to company failure has been identified as the extreme value of financial statements.

4.5 UNIVARIATE ANALYSIS

Altman (1971:59) defines univariate analysis as a study that can only measure the variables within a group one variable at a time. In this study, the mean explained by

Babbie (2013(a):245), as adding the values of observations and then dividing them by the number of observations in order to calculate an average, is applied. Of 16 companies in total, eight failed and eight did not fail within three JSE industries under review of which 17 ratios were used in this study. The financial indicators per industry will be demonstrated in Table 4.3 below.

Table 4.3: Financial indicators per industry

	Failed	Non-Failed	Failed	Non-Failed	Failed	Non-Failed
Industry	Consumer Goods		Consumer Services		Industrial	
Statement of Financial Position						
Owners Interest	11 944 059.60	13 638 506.20	1 756 007.40	14 219 484.60	762 201.20	494 843.40
Long Term Loan Capital	2 537 301.20	6 902 786.40	776 397.60	610 697.20	937.00	1 268.20
Inventory	5 449 286.40	10 069 748.40	731 567.00	10 620 894.80	374 211.60	248 283.80
Debtors	3 312 380.80	7 879 786.80	2 874 073.20	10 074 904.60	389 796.40	358 390.20
Current Assets	12 255 148.20	22 174 491.40	3 828 737.40	23 886 009.80	935 063.00	769 713.80
Current Liabilities	4 475 230.40	14 153 596.20	2 463 958.60	20 280 648.80	528 572.20	437 891.60
Total Assets	18 956 591.20	34 694 888.80	4 996 363.60	35 110 830.60	1 291 710.40	934 003.20
Statement of Comprehensive Income						
Sales	32 722 406.00	36 429 782.20	5 137 089.60	96 578 857.60	2 364 135.80	1 879 037.20
Gross Profit	2 339 815.40	6 843 765.00	122 460.20	694 311.00	162 988.80	181 669.40
EBIT	1 396 432.20	8 899 367.80	-1 770.20	3 535 740.60	110 001.00	195 004.40
Total Interest Paid	542 297.40	836 064.40	320 344.60	501 799.20	2 204.60	63 977.40

	Failed	Non-Failed	Failed	Non-Failed	Failed	Non-Failed
Industry	Consumer Goods		Consumer Services		Industrial	
Retained Profits	228 239.80	5 341 518.00	-423 661.40	1 612 627.00	55 188.20	26 920.00
Statement of Cash flow						
Cash from Operating Activities	1 182 344.40	1 400 130.80	-830 074.60	3 132 904.20	70 556.60	39 928.00
Ratios						
ROA	0.07	0.26	0.00	0.10	0.09	0.21
Inventory Turnover	6.00	3.62	7.02	9.09	6.32	7.57
Accounts Receivable Turnover	36.95	78.95	204.21	38.08	60.18	69.62
Debt Ratio	0.37	0.61	0.65	0.60	0.41	0.47
Debt to Equity	0.59	1.54	1.85	1.47	0.69	0.89
Interest cover	2.58	10.64	-0.01	7.05	49.90	3.05
Gross Profit	0.07	0.19	0.02	0.08	0.07	0.10

Source: McGregor BFA (2014) adjusted for own research

Swart (2013:54–55) developed materiality drivers due to current concerns that there are different risks related to companies within different industries. A comforting sampling was used for cross-sectional comparisons and only one company from different industries was applied. The first three drivers will be adopted in this study and the materiality drivers will be adjusted to business drivers. The steps are types of industry, primary business drivers and lastly secondary business drivers. The type of industry is important as their needs and uses of different financial indicators vary. The primary driver and secondary drivers will also differ, as the primary business driver in one industry might not be a primary business driver in another industry and this applies to the secondary business drivers as well. Table 4.4 below illustrates the business driver identified for the three industries in this study.

Table 4.4: Business drivers

Industry	Primary Driver	Secondary Driver
Consumer Goods	Sales / Revenue	Inventory + Profit
Consumer Services	Staff	Profit
Industrial	Sales/ Revenue	Assets

Source: Swart (2013:57)

The rationale behind the business drivers is the primary business drivers and secondary business drives are diverse for the industries under review. The primary business drivers and secondary business drives for consumer goods normally has high sales' volumes; high inventory levels with low profits. The primary drivers for consumer services are staff because staff renders the service (normally professional services) in order to make a profit, which is the secondary driver. Industrial different revenue recognition types and revenue is an important driver followed by assets, as this industry normally uses very expensive equipment.

In this study companies in specific industry will be looked at as a result of their different business drivers. However, companies cannot be compared among each other, therefore companies' averages will only be compared within the same industry.

The consumer goods industries assets of the non-failed are more than failed and so were the assets in the consumer services industry. In the industrial industry, the failed

were more than the non-failed, meaning company failure is not limited to a company's assets size. Not only smaller asset sized companies are exposed to failure, as can be seen with industrial figures. The return on assets ratio reveals all three industries' non-failed ratio was higher than the failed, pointing out that the non-failed utilize their assets effectively and of the three industries, the industrial ratio was the highest as their secondary business driver is assets.

Inventory in the consumer goods and consumer services industry indicates the non-failed being higher than the failed and in the industrial industry the failed is higher than the non-failed. Consumer services and consumer goods have the highest inventory average: firstly consumer services, followed by consumer goods. These industries' inventory moves quicker than the industrial, which in turn should have a higher inventory turnover. The industrial inventory turnover ratio in this study is higher than consumer goods because of the high sales level and the low inventory level will have a higher ratio. Consumer services' failed and non-failed ratios are higher than consumer goods and industrial.

The industrial industries sales were greater with the failed group than the non-failed and consumer goods, and in consumer services, their non-failed groups' sales were greater than the failed. There is no big difference between consumer goods' failed and non-failed sales, indicating that even if companies have high sales, if their expenses, finance structure or other obligations are not met or managed correctly, the companies are not immune to failure. Consumer goods industry will normally have a high sales level with small profit, since they usually have a thin margin. In summation: higher sales volumes at lower prices result in small or low profit. Industrial industry had high profits, fewer goods were sold at higher prices, implying inventory turnover is less, but at higher prices leading to higher profits.

With liabilities it is expected that failed companies have higher gearing compared to the non-failed, due to their high levels of debt. Yet there was no great difference within the industries between the failed vs. non-failed: consumer goods gearing at 37% vs. 61%, consumer services at 60% vs. 65% and industrial 41% vs. 47%. Short term debt is as a rule more expensive than long term debt because short term debt is usually without security being provided meaning higher risk. A company having more short term debt than long term debt will have high interest expenses. Consumer goods' interest is the highest, followed by consumer services and then industrial industries. Regardless of the

high interest consumer goods need to pay, the interest cover is also the highest, meaning they can cover the interest expense 10 times while consumer services can cover their 7 times and industrial industries 3 times. The interest cover of the failed companies is twice for consumer goods, negative for consumer services and 49 times for industrial industries as they have low levels of interest paid and debt with a high sales figure.

In retained earnings in industrial industry, the failed were more than the non-failed. Failed consumer services were negative and in consumer goods, the failed was significantly lower than the non-failed. With low or no retain earning signals as stated by Brigham *et al.* (1999:38) retained earnings being “*a claim against assets not assets per se.*”

In concluding it can be seen, for instance with industrial industries figures, that failure cannot be as a result of a specific indicator and the indicator should be looked at holistically. Industrial failed companies’ retained earnings are more than the non-failed; the failed pay less interest, the assets and current assets are higher. The long term debt is lower and the equity higher, and yet they still failed.

4.6 RATIO TREND ANALYSIS

Sharma (2012:28) enlightens trend analysis as an intercompany comparison technique, by analysing the performance over a number of years and is mostly used for future predictions. Charles and Patricia (cited by Sharma, 2012:28) state “*by looking at the trend developed through the time series analysis (known as the ratio trend analysis) of financial statements and it’s ratios, one can see whether the performance of a company is falling, rising or is relatively constant*”. The reason why trend analysis is done, is explained by Rosenberg (1997:5) to discern whether there is a change in ratio patterns over time, comparing one period of time with another, to evaluate the degree of change before and after an event and allowing future projections to be made by monitoring the process.

In this study, 13 ratios will be applied and these ratios were selected from Correia *et al.* (2011:5.37). Ratios were computed by The Bureau of Financial Analysis and have been summarized by ABSA for selected industries in South Africa and sought after ratios in relation to prior studies. The ratios selected are displayed in the five key ratio groups

that are liquidity consists of current and quick ratios, profitability comprises of net operating profit margin, net profit margin, return on assets and return on equity. Assets management includes inventory turnover ratio, total assets turnover ratio and accounts receivable turnover ratio. Debt management covers debt ratio, debt to equity ratio and the interest cover ratio, and finally operating cash flows consist of cash flow to total debt. Due to missing financial statement data, not all the ratio included in the list of selected ratio will be calculated.

The trend of the failed companies will be compared to the non-failed companies within the same industry. First year will be the base year (starting point) for both failed and non-failed companies and performance will then be compared to the other remaining four years.

4.7 TREND ANALYSIS - LIQUIDITY

Liquidity ratio, as stated by various authors, measures whether a company can meet their short-term commitments in order to determine whether the company is monetarily safe. According to O'Hara (cited by Mann, 1996:108), liquidity can without difficulty be recognized, but it is not so effortlessly defined and he compares it with pornography. Basel Committee of Banking Supervision (BCBS) refers to a company being liquid as and when a company can meet their liquidity requirements over a 30 business day period by possessing high-quality assets that are liquid, meaning the assets have the ability to be converted into cash instantly (BIS, 2010:3-5). Assets can be characterized as high-quality if they can be converted into cash immediately at a minimal value loss. Asset with a higher degree of liquidity are the assets with low risk, low inflation risk, low exchange risk and low instability. If assets value can be easily calculated and be easily obtainable it is also a contributing factor of high-quality assets. Trustworthiness of the assets is increased when there are diverse buyers and sellers of the assets and assets are of companies listed on an exchange market.

Liquidity ratios consist of current ratio and quick ratio. In the tables 4.5 to 4.12 below, the trend of these ratios will be evaluated for both failed and non-failed companies in all the industries in the sample. The base year will be the starting point in looking at the current ratio and quick ratio trends, ratios are computed by the McGregor BFA database in order to determine whether there has been an increase or decline in relation to Y2 up

to Y5. Rationale is to ascertain whether the company's performance has improved or deteriorated, resulting in financial distress signals.

The current ratio signals whether a company's current liabilities can be repaid using their current assets. The quick ratio is similar to the current ratio. It only excludes inventory. Smart and Graham (2012:41) explain the rationale for excluding inventory; it is least liquid because when it is sold on credit, inventory first becomes accounts receivable before being converted into cash. The chartered institute of management accountants (CIMA, 2009:23) have indicated the levels of risk, high risk (<1.0), average risk ($1.0-1.5$) and low risk (>1.5) for current ratio. For the quick ratio high risk (under 0.75), average risk ($0.75-1.25$) and low risk (over 1.25), this indication will be utilized as a guideline.

4.7.1 Consumer Goods

Table 4.5: Liquidity ratios for Amlac Limited vs. Metair Investment Limited

Company Name	Failed					Non-Failed				
	ALC					MTA				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	1.03	1.90	1.57	0.59	3.55	1.85	2.62	2.76	2.52	2.60
Quick Ratio	0.63	1.19	0.87	0.32	2.11	0.81	1.56	1.39	1.33	1.42

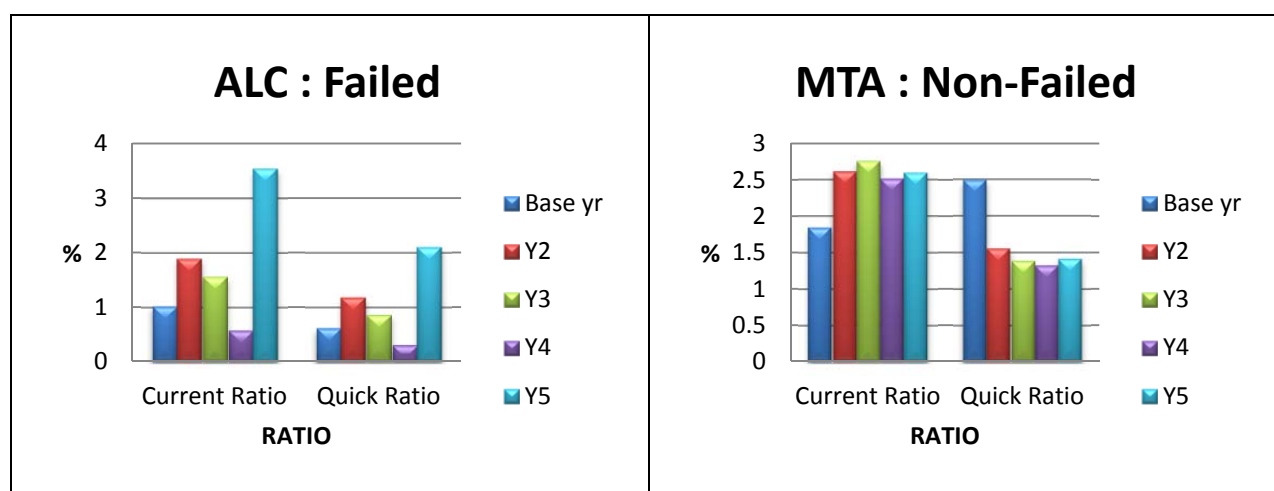
Source: McGregor BFA (2014) adjusted for own research

Table 4.5 illustrates the current and quick ratio of ALC and MTA for five consecutive years. Current ratio for ALC fluctuated in relation to the base years, in Y4 it declined significantly as their short term borrowing increased significantly. In Y5 ALC's creditors declined, causing 71% decline in the current liabilities with only a 27% decline in the current assets. The numerator is much higher than the denominator, resulting in an increase in the current ratio. In the base year and Y3 the current ratio was at average risk, Y2 and Y5 at low risk and Y4, the current ratio, falls within the high low risk. MTA in relation to the base year has been increased consistently. The current assets decreased and increased in the range of 13% maximum 30% over the period. The current liabilities' increases and decrease were in the range of 3% to maximum 26%.

Therefore one could say the current assets and current liabilities increases and decrease were in relation with each other. Over the course of the five year financial period, the current ratio of MTA fell within the low risk grid from the base year right through to Y5.

The quick ratio of ALC changed it first increased in Y2 compared to the base year, then declined in Y3 with a further decline in Y4 and in Y5 it increased again. In Y2 ALC had the following increase in short-term borrowing (7%), creditors (74%), inventory (82%) and accounts receivables (30%), meaning they acquired inventory on credit. The ratio in Y3 declined due to increase of the current liabilities, short term borrowings increased by 93% and acquired a bank overdraft. In Y4 current liabilities increased with about 50% due to the significant increase in the short term borrowings of 55% and the bank overdraft declined by 62%. In Y5 question marks are raised: 74% decline in the creditors, 100% decline in the short term borrowings and bank overdraft, the turnover and cost of sales declined by 22%. In the base year the ratio was in the high risk area moving to the average risk in Y2 and Y3. In Y4 it was within the high risk area moving over to the low risk area in Y5. MTA's quick ratio increased steadily over the period in Y2 to Y5 in comparison with the base year. The reason for the increase in the ratio could be due to a lesser inventory value that was deducted, resulting in a high liquid assets value, meaning the numerator increased causing the ratio to rise. MTA moved from average risk in the base year to the low risk throughout the period of investigation. Information in Table 4.5 is demonstrated Figure 4.2 below.

Figure 4.2: Liquidity ratio comparison for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

Figure 4.2 reveals that the failed companies' current and quick ratio is higher than the non-failed company. Table 4.6 follows and the trend of WES and CFR will be explained.

Table 4.6: Liquidity ratios for Wesco Investments Limited vs. Compagnie Financiere Richemont

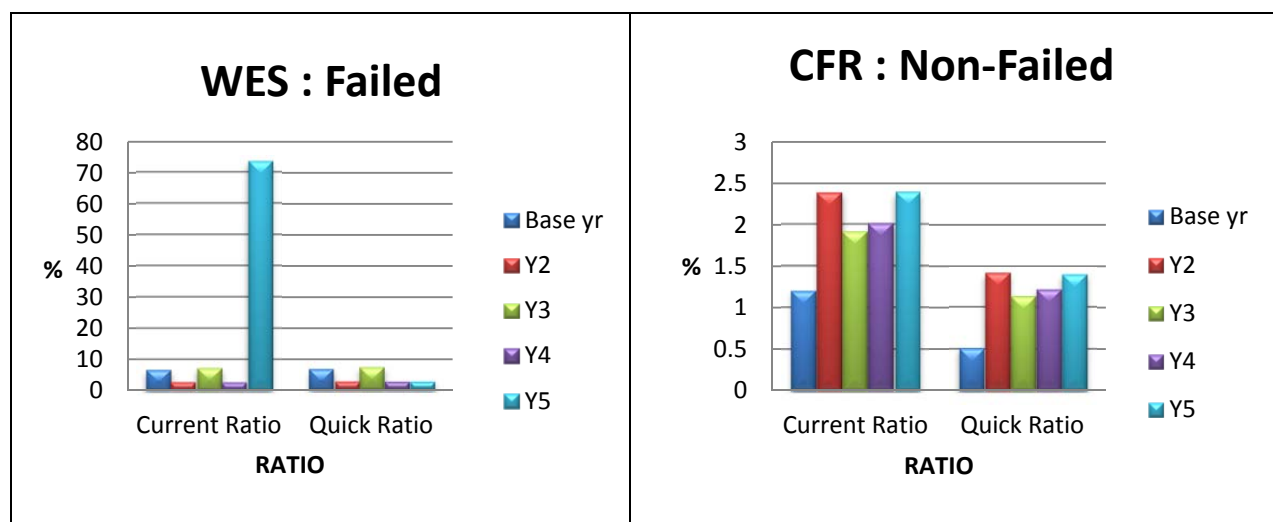
Company Name	Failed					Non-Failed				
	WES					CFR				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	6.86	2.92	7.47	2.92	73.76	1.21	2.39	1.92	2.02	2.40
Quick Ratio	6.86	2.92	7.47	2.92	73.76	0.52	1.42	1.14	1.22	1.40

Source: McGregor BFA (2014) adjusted for own research

WES's current ratio is better than the CFR which is a non-failed company and the fluctuations are very irregular: from a 6.8 ratio in the base year, to a 2.9 drop then 7.4 rise in the next year followed by a decrease to 2.9 and suddenly a massive increase to 73.7. These abnormal increases and decreases especially in Y5 are already a sign of concern. In Y2 the current liabilities increased by 99%, the following year they declined by 15%, with a further 77% increase in the subsequent year and then a 94% decline in Y5. In addition, the short term borrowing and short term advances have been increasing significantly since Y3 up to Y5. On the other hand CFR's ratio has also seen fluctuation, which is no sign of concern as the ratio declined in Y3 which was caused by an increase in the assets as well as an increase in the current liabilities. According to the CIMA guide (CIMA, 2009:23), the current ratio of WES fell within low risk zone for the full period and CFR's current ratio was at high risk in the base year and low risk from Y2 to Y5.

Quick ratio for the WES is identical to current ratio because WES has not had any inventory for the past five years. CFR's variation was due to the increase and decrease of the inventory. When the inventory decreases, the ratio increases because the liquid assets are higher and therefore the ratio will be higher and vice versa. WES's quick ratio from the base years up to Y5 was in the low risk zone. CFR's base year was in the high risk zone. Y2 and Y5 were in the low risk area and at an average risk in Y3 and Y4. Figure 4.3 will better explain the ratio demonstrated above.

Figure 4.3: Liquidity ratio comparison for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

When the current ratio and the quick ratios are identical, as indicated in Figure 4.3, it indicates the company has no inventory. Both WES's current and quick ratios are the same. WES operated in the automotive sector that falls under the consumer goods industry marketing and manufacturing of motor vehicles. For this company not having any inventory indicates a huge financial problem. When ratios are abnormally high, the door of possible manipulation of financial statement data is opened. The trend analysis of PAL and SHF will be looked at next in Table 4.7.

Table 4.7: Liquidity ratios for Pals Holdings vs. Steinhoff International Holdings Limited

Company Name	Failed					Non-Failed				
	PAL					SHF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	2.01	3.45	4.34	2.26	1.43	1.91	2.30	1.74	1.52	1.25
Quick Ratio	1.45	2.01	2.60	1.09	0.82	1.61	1.94	1.37	1.20	0.96

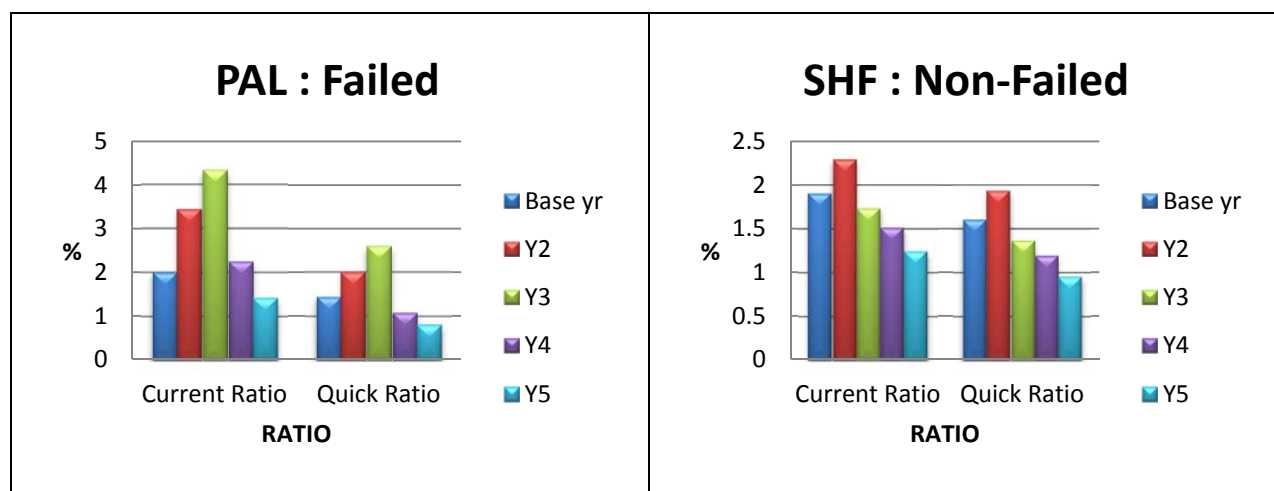
Source: McGregor BFA (2014) adjusted for own research

Table 4.7 discloses that PAL's current ratio was in the low risk area for the full five year period. As previously stated, whenever the failed company's ratios are superior to those

of the non-failed company, manipulation of figures comes to mind. The current ratio of PAL increased from Y2 to Y3 and then dropped about 50% in Y4 and experienced a further drop in Y5. The current assets decreased from 43% in Y2, 2% in Y3, .05% in Y4 and then increased by 11% in Y5. The bank decreased at 72% in Y2, 96% in Y4 and again 63% in Y5. The current liabilities decreased in Y2 and Y3 in Y4 had a 91% increase and then again a 75% increase in Y5. This was due to significant increases in Y2 and Y4 up to 80% in creditors, bank overdraft, short term borrowings and accounts receivables increased. The current ratio of SHF fluctuates due to the increase in both current asset and current liabilities and the increases were in relation with each other. SHF was within the low risk area from base years to Y4 and Y5 moved within the average risk.

PAL's quick ratio increases when the inventory decreases, creating a higher liquid asset. In Y4 and Y5 the decline in ratio was due to the increase of the current liabilities which in turn increases the denominator, resulting in the drop in the ratio. Due to the high level and nature of business it is expected that the quick ratio will decline. In Figure 4.4 below a better explanation of the ratio will be illustrated.

Figure 4.4: Liquidity ratio comparison for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

The quick ratio for PAL and SHF declined, but SHF declined consistently from Y2 as a result of the nature of business, an international manufacturer and retailers of furniture and household goods. Both PAL and SHF were at low risk from base year to Y3 and in the average risk area in Y4 and Y5. The upcoming Table 4.8 describes the trend of TIW and SER.

Table 4.8: Liquidity ratios for Tiger Wheels Limited vs. Seardel Investments

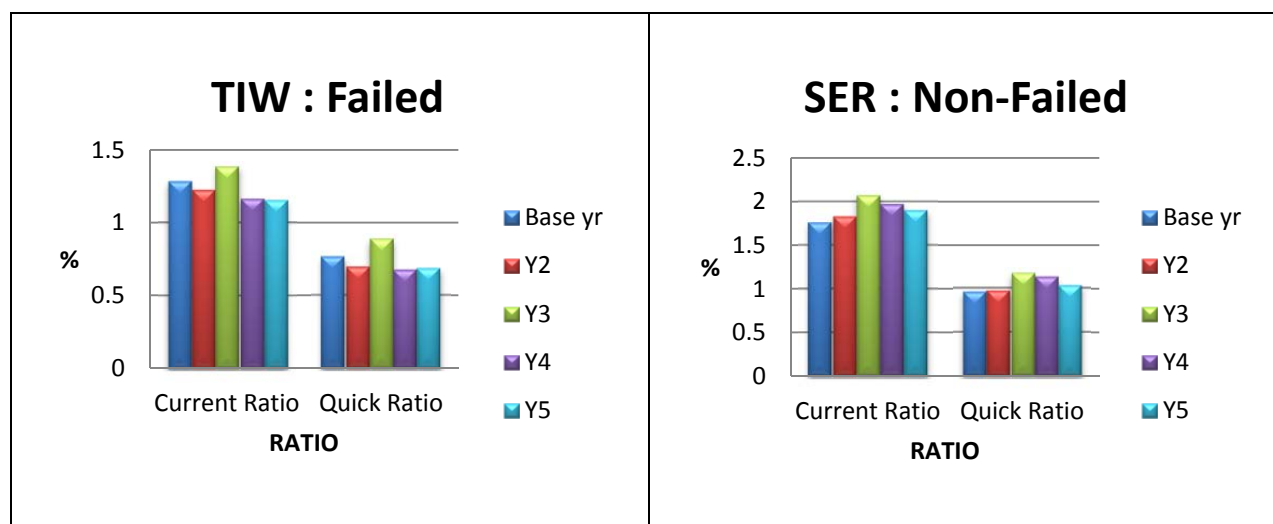
Company Name	Failed					Non-Failed				
	TIW					SER				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	1.29	1.23	1.39	1.17	1.16	1.77	1.84	2.08	1.98	1.91
Quick Ratio	0.77	0.70	0.89	0.68	0.69	0.97	0.98	1.18	1.14	1.04

Source: McGregor BFA (2014) adjusted for own research

The current ratio of TIW increased in Y3. In Y2 and Y4 current assets decreased and in Y3 and Y5 they increased. In Y5 TIW obtained short term advance and already had an increasing bank overdraft and short term borrowing for the five year period. The five year period fell within the average risk zone. SER's current ratio had been increasing and decreased when the bank overdraft and short term borrowings increased. SER and TIW's current ratio over the five financial years was within the low risk zone.

TIW's quick ratio fell in an average risk for the base year and Y3, and in the high risk zone for Y2, Y4 and Y5 of the five year period. It decreased when the inventory increased, causing the liquid assets to decrease and the denominator to increase, which in turn influences a drop in the ratio. A consistent varying of the inventory caused the decrease and increase in the ratio and is to be expected as SER's nature of business is trading in household goods. SER's quick ratio fell in the average risk area from base year right up to Y5. In Figure 4.5 an explicit view of the changes are conveyed.

Figure 4.5: Liquidity ratio comparison for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

It is visible in Figure 4.5 that the non-failed company's (SER) current and quick ratio is shown to be higher than that of the failed company (PAL) throughout the five year period under review. In Table 4.9 and 4.10 the liquidity ratio of the consumer services companies will be discussed.

4.7.2 Consumer Services

Table 4.9: Liquidity ratios for Retail Apparel Group Limited vs. Shoprite Holding Limited

Company Name	Failed					Non-Failed				
	RAG					SHP				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	4.12	1.68	1.60	1.18	1.67	0.93	0.96	0.98	1.08	1.01
Quick Ratio	3.31	1.41	1.27	0.92	1.33	0.38	0.39	0.45	0.48	0.50

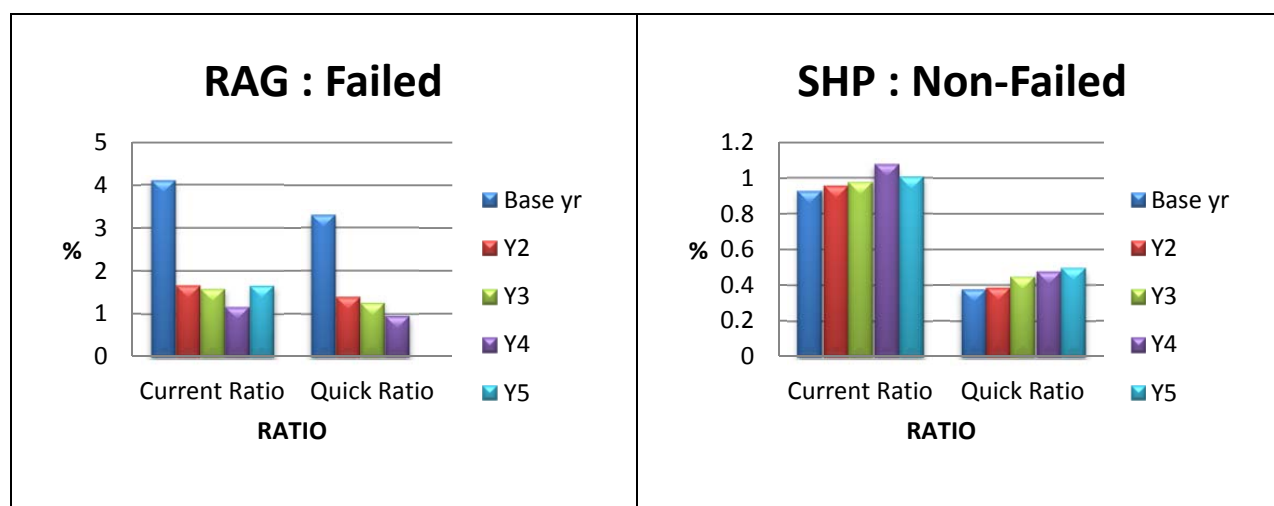
Source: McGregor BFA (2014) adjusted for own research

The current ratio is over one for RAG, meaning there are enough current assets to settle the current liabilities. The ratio decreases in Y2 to Y4 from 1.68 to 1.60, then to 1.18 and increased to 1.67. The short term borrowing and bank overdraft increased in Y2 and Y3 compared to the slight increase in cash. According to the CIMA guide

(2009:23), RAG was at low risk from the base years to Y3 and Y5; in Y4 it was at average risk. SHP's current ratio is below one. Having too many current assets is not always a good thing: it indicates the current assets are not being re-invested. Due to the nature of SHP's business as a hypermarket, it is expected to have high inventory levels. SHP was at high risk base year to Y3 and at average risk in Y4 and Y5.

The quick ratio of RAG decreased as the inventory levels increased consistently, causing a decrease in the liquid assets that resulted in a ratio drop. The increase of SHP's quick ratio throughout the period could be due to the increase of inventory levels and increase in the current assets that will result in higher liquidity causing the numerator to increase that will increase the ratio. The quick ratio of RAG's risk was low for the base year to Y3 and Y5 and Y4 at an average, SHP was at high risk throughout the five year period. Figure 4.6 graphically represents the ratios in Table 4.9.

Figure 4.6: Liquidity ratio comparison for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

Figure 4.6 gives a clearer indication that the failed company (RAG) is declining in both current and quick ratio, with an increase in the current and quick ratio of the non-failed company (SHP) over the period under investigation. After this, in Table 4.10 the trend analysis of TRX and WHL will be explored.

Table 4.10: Liquidity ratios for Terexko Limited vs. Woolworths Holding

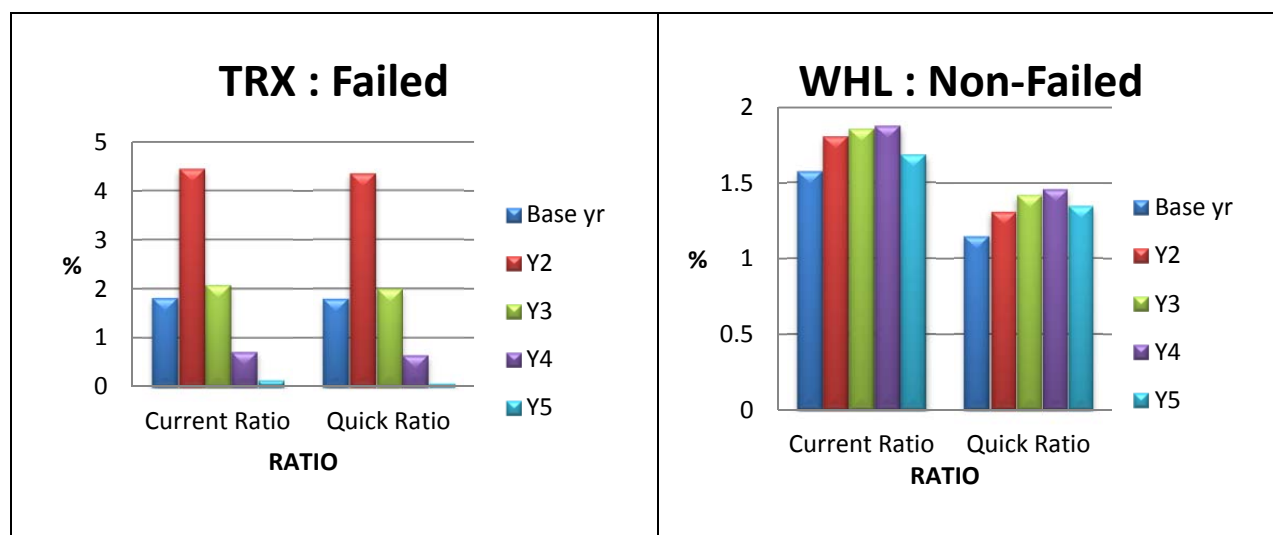
Company Name	Failed					Non-Failed				
	TRX					WHL				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	1.83	4.46	2.09	0.73	0.15	1.58	1.81	1.86	1.88	1.69
Quick Ratio	1.81	4.36	2.01	0.66	0.08	1.15	1.31	1.42	1.46	1.35

Source: McGregor BFA (2014) adjusted for own research

There was an increase in the current ratio for TRX in Y2 and a decline in Y3 to Y5. The increase in the ratio in Y2 was due to decline in both the current asset and liabilities but the current assets only declined at 37%, while the current liabilities declined at 74%, resulting in the greater decrease in the dominator ensuring a decrease in the ratio. CIMA guide (2009:23) indicated TRX's risk was low in the base year to Y3 and high in Y4 and Y5. For WHL, the ratio increases consistently during the full period with a slight decline in Y5 and was at a low risk over the entire period under review.

TRX's quick ratio increased in Y2 and thereafter the ratio declined. It was at a low risk in the base year to Y3 and high in Y4 and Y5. The current assets and inventory decreased, creating a lower liquid asset and the ratio will automatically decrease. WHL's quick ratio consistently increased and faintly dropped in Y5 due to the nature of WHL's business. In the base year, the risk was at an average and Y2 to Y5 at a low risk. Figure 4.7 that follows will give the graphical trend analysis and signify the variation between the current and quick ratio.

Figure 4.7: Liquidity ratio comparison for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

TRX has a significant rise in Y2 and WHL fluctuated throughout the reviewing period as can clearly be seen in Figure 4.7. The trend analysis of the industrial industry will be looked at in the following Tables 4.11 and 4.12.

4.7.3 Industrial

Table 4.11: Liquidity ratios for Northern Engineering Industries Limited vs. Howden Africa Holding

Company Name	Failed					Non-Failed				
	NEI					HWN				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	1.85	1.75	1.59	1.96	1.80	1.44	1.82	1.78	1.73	1.77
Quick Ratio	1.13	1.17	0.99	1.01	1.05	0.98	1.22	1.16	1.23	1.20

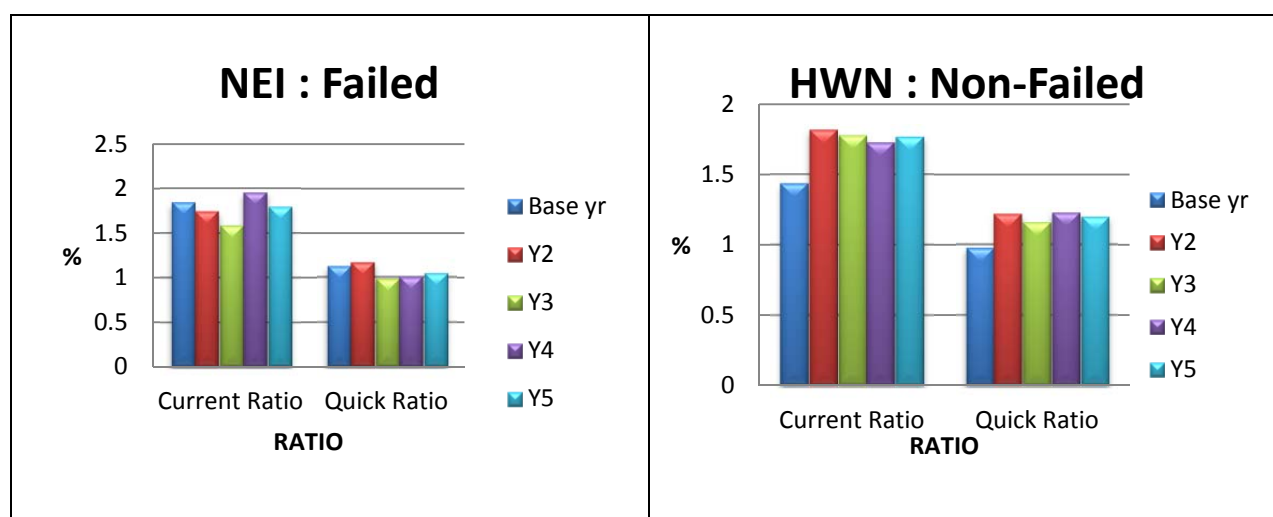
Source: McGregor BFA (2014) adjusted for own research

The current assets in both companies NEI and HWN are above one, indicating that the companies are able to meet their short term obligations. The movement in the ratios was due to increases and decreases in the current assets and liabilities, and the fluctuation depended on the percentage of change, for instance in Y2 the current assets increase at 20% while the current liabilities increased at 26%, causing a decrease in the

ratio. HWN's ratio increased in Y2 because the current assets increase at 13% and current liabilities decrease at 11%, which resulted in an increase in the ratio. Thereafter the current ratio increased consistently. The current ratio is at a low risk from base year to Y5 for NEI and at an average in base year and low risk Y2 to Y5.

The quick ratio fluctuated. When NEI's ratio decreased, the inventory ratio increased. The risk according to CIMA (2009:23) is average in the base year to Y2, Y4 and Y5 and high risk Y3. HWN's quick ratio increased from the base year to Y2 and in Y4, declined in Y3 and in Y5. Thereafter the varying in the ratio was due to the change in inventory levels and risk is at an average through the period under review. Figure 4.8 shows the fluctuations of the ratio for both NEI and HWN.

Figure 4.8: Liquidity ratio comparison for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

The graphical representation points out similar fluctuations in the current ratios for NEI and HWN, while the quick ratio for HWN and NEI for Y2–Y5 are in relation with each other. Table 4.12 will illustrate the current and quick ratio between DLG and WKF.

Table 4.12: Liquidity ratios for Dialogue Group Holding Limited vs. Workforce Holding

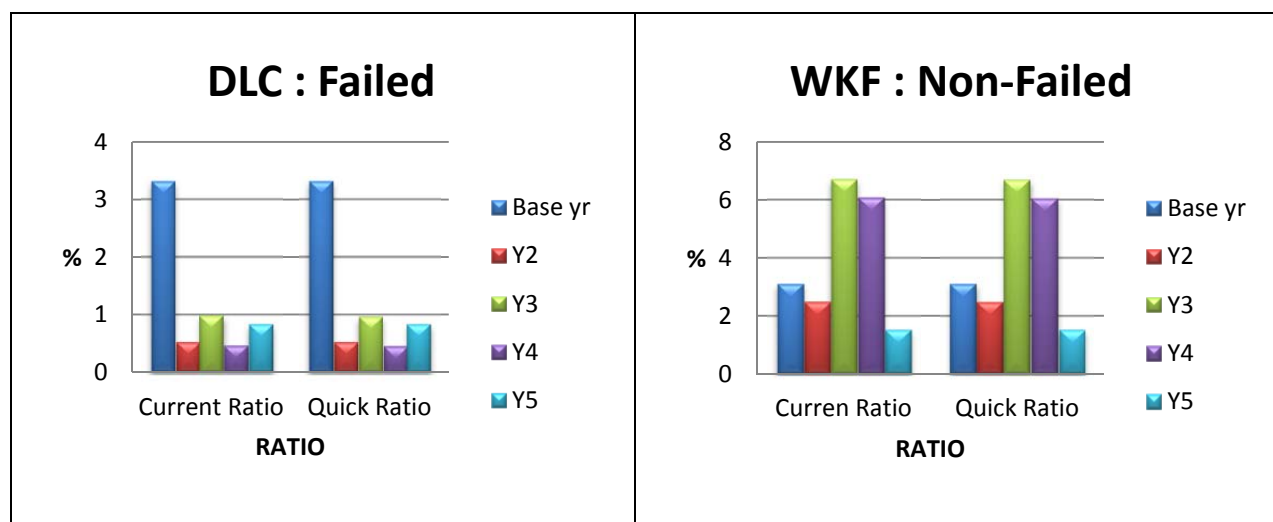
Company Name	Failed					Non-Failed				
	DLG					WKF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Current Ratio	3.33	0.54	1.00	0.48	0.85	3.13	2.52	6.74	6.11	1.55
Quick Ratio	3.33	0.54	0.98	0.47	0.85	3.13	2.51	6.72	6.08	1.55

Source: McGregor BFA (2014) adjusted for own research

The current ratio for DLG varies: decreases in Y2 and Y4, and increases in Y3 and Y5. The reason for the decrease in Y2 and Y4 was the increase in current liabilities in those years. The growth in the ratio in Y3 and Y5 was as a result of the decrease in the current liabilities in those years. DLG's risk in the base year was indicated as low, high in Y2, Y4 and Y5, and average in Y3. WKF's ratio increase for the duration of four years and in the fifth year it decreased and was at a low risk for the duration of the five year period.

The quick ratio movement of DLG was due to DLG only having inventory in Y3 and Y4, and the bank overdraft increased in Y2 and Y4 and dropped in Y3 and Y5. The debtors increased in Y2 and declined in Y3 to Y5. The risk level was low for the base year, high for Y2 and Y4, and average for Y3 and Y5. WKF's ratio varied due to the changes: current liabilities, debtor, inventories and the creditors increasing and decreasing over the period under investigation and a low risk level was indicated by CIMA (2009:23) for the five year period. Information in Table 4.12 is demonstrated Figure 4.9 below.

Figure 4.9: Liquidity ratio comparison for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.9 it is apparent that WKF's ratios are much higher than DLG, yet both the companies' current and quick ratios are identical, due to the affect of no inventory and it is understandable, as the nature of WKF's business is that of staffing and recruitment specialist, and DLG a call centre outsourcing business service.

The failed companies' liquidity ratios were generally better than the non-failed companies'. It was found that 63% of the failed companies' current and quick ratios were better than the non-failed company's ratios and in some cases even exceeded the rule of thumb, current ratio being 2:1 and quick ratio being 1:1. The financial statement has indicated that the reason for the differences was that the failed companies' current assets were much higher, due to extraordinary profits the companies had which increased annually, and the current liabilities being either zero (in the case of WES) or much lower. There was an increase in both current assets and current liabilities, but the current asset ratio percentage increase was higher than that of the current liabilities. Or the current liabilities decreased, with the current assets either increasing or remaining within the same range. With the quick ratio it was revealed there was a decrease in the inventory of the failed company's inventory levels, creating higher liquid assets which in turn result in a ratio increase and the inventory level on the non-failed companies increase, triggering decrease in the liquid assets.

4.8 TREND ANALYSIS - PROFITABILITY

Smart and Graham (2012:45) refer to the profitability as “*the mostly widely watched and quoted financial ratios*”. Ebelthite (1998) explains that the group of profitability ratio is the easiest ratios to use, understand and accept, especially by a non-financial manager. The crux of this ratio is to analyse the liaison between profit recognized and sales produced.

Grossman and Livingstone (2009:26) explain the importance of analysing the profitability of a company to ensure its sustainability, because when a company incurs too many losses, they will only be able to survive until their cash flow runs out.

In the Tables 4.13 to 4.19 below, the profitability ratios will be discussed over a five year period for the three industries within the sample. The base year will be the point of commencement and will be compared to Y2 till Y5.

First looking at the net profit margin (NPM) ratio, which is the percentage that is returned as profit after deducting cost, including interest, tax and dividends, the operating profit margin (OPM) will be assessed, being the percentage that is returned as a profit that excludes interest and taxes. Thirdly, the return on assets (ROA) will be evaluated. For every rand tied up in assets, what is the amount of income produced? And lastly, the return on equity (ROE) will be looked at, being the return shareholders or investors are getting on their investments. CIMA (2009:24) suggest a guide for net profit and return on equity in categories low, average and high. Net profit is low ratio when less than 3%, average ratio between 3-10% and high ratio is when it is >10%. The return on equity is branded as low ratio being < 6%, average ratio between 8-11% and the ratio is high when it is >11%. Net profit margin (NPM), operating profit margin (OPM), return on assets (ROA) and return on equity (ROE) ratio will be compared for ALC and MTA in Table 4.13 below.

4.8.1 Consumer Goods

Table 4.13: Profitability for Amlac Limited vs. Metair Investment Limited

Company	Failed					Non-Failed				
	ALC					MTA				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	7.18	7.45	-6.42	-9.81	20.32	4.96	8.93	5.53	3.55	8.19
Operating Profit Margin %	13.23	11.22	-0.74	-2.81	9.51	8.44	8.92	8.84	6.49	11.46
Return On Assets %	18.71	11.52	-1.16	-4.55	10.65	12.08	10.23	9.27	6.94	13.91
Return On Equity %	39.75	25.22	-81.35	690.81	19.75	14.57	12.55	10.93	8.13	18.91

Source: McGregor BFA (2014) adjusted for own research

ALC's NPM ratio was negative in Y3 and in Y4, the base year, Y2 and Y5 ratios increased. ALC's ratio was between 3-10% for base year, Y2 and Y5 and <3% in Y3 and Y4. MTA's ratio fluctuated and fell within average 3-10% according to the CIMA guide (CIMA, 2009:24).

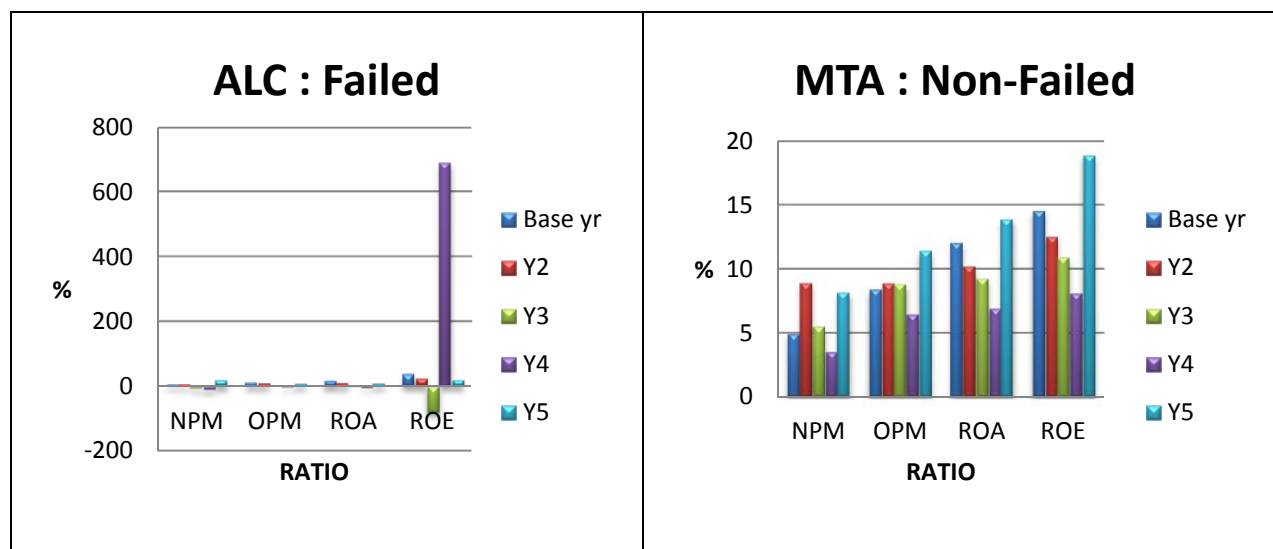
An increase occurred in the base year and Y2, then Y3 and Y4 the OPM was negative for ALC and low ratio indicate high cost. MTA had an average of 8% in the base year, in Y3 the ratio declined to 6% and in Y5 it increased to 11%, meaning costs have decreased.

The ROA ratio indicates the amount of profit that can be produced from the effective use of the company's assets. A decrease in the ratio is not a good sign, as ALC's ratio decreased from the base year to Y2 and in Y5, in Y3 and Y4 the ratio was negative. MTA declined from the base year to Y4, and in Y5 it increased.

The ROE indicates how well the shareholders' investment is doing; a decrease in the ratio could indicate an increase in cost. From the base year to Y2 net income and equity increased, in Y3 to Y4 there were unusual fluctuations. Net income in Y3 was negative with a positive equity resulting in a negative outcome (ratio). The reason for the abnormal ratio of 690 in Y4 was a massive decline of both the net income (-5409) and

equity (-783), both being negative. Mathematically a negative financial indicator divided by another negative financial indicator results in, in this case, an abnormal positive. The ratio increased in Y5. MTA from base year to Y4 and Y5 an increased arose. Base year, Y2 and Y5 grouped under high ratio category (>11%) and Y3 and Y4 fell within the average ratio (8-11%). The Figure 4.10 below graphically supports the above interpretation.

Figure 4.10: Profitability ratio comparison for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

Figure 4.10 graphically indicates ALC's ROE has unusual ratios in the base year, Y3 and Y4 compared to MTAs' ROE. Table 4.14 displays the profitability ratio for WES and CFR.

Table 4.14: Profitability ratios for Wesco Investments Limited vs. Compagnie Financiere Richemont

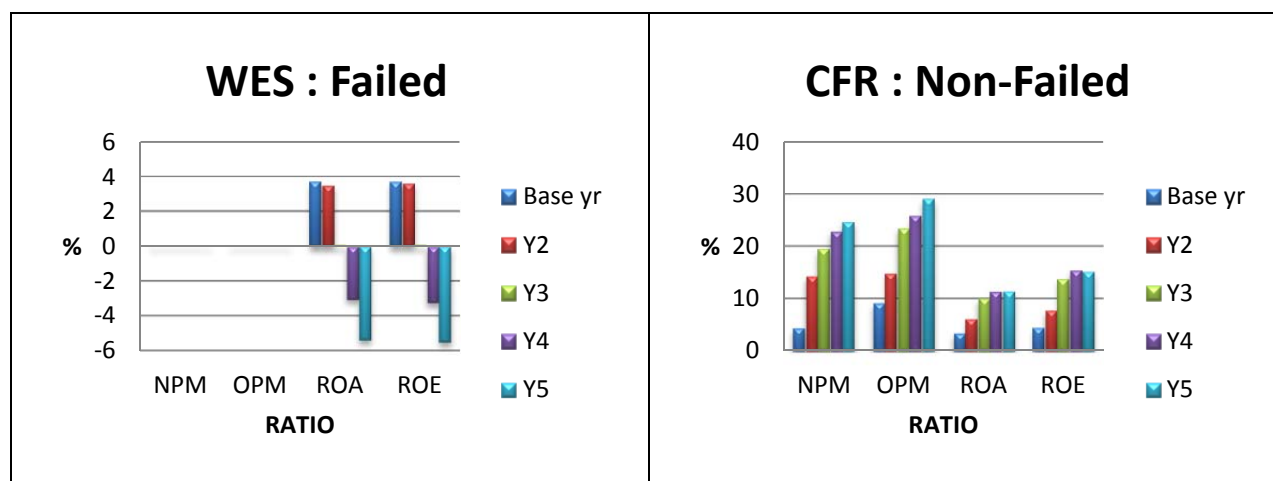
Company	Failed					Non-Failed				
	WES					CFR				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	0.00	0.00	0.00	0.00	0.00	4.47	14.37	19.59	22.91	24.73
Operating Profit Margin %	0.00	0.00	0.00	0.00	0.00	9.27	14.88	23.51	25.92	29.18
Return On Assets %	3.51	0.11	-3.07	-5.40	-207.96	3.48	6.18	10.12	11.45	11.46
Return On Equity %	3.63	0.12	-3.25	-5.52	-210.82	4.56	7.86	13.85	15.50	15.22

Source: McGregor BFA (2014) adjusted for own research

WES's NPM and OPM were negative throughout the period of review. The financial statements have indicated the justification for WES's zero NPM and OPM due to there being no sales for the five consecutive years under review, any amount divided by zero is zero. CFR's NPM and OPM ratio has increased consistently for the duration of the period under study.

WES's ROA and ROE ratio was very low in Y2 and negative ratio in Y3 to Y5 (an unusually high negative ratio in Y5), indicating the company's assets are not being managed and investors investment is not doing well. CFR's ROA and ROE ratio on the contrary are doing very well, the ratios are increasing consistently, meaning the asset management improves every year and investors are getting more from their investments every year. In Figure 4.11 below adds visual meaning to the ratios.

Figure 4.11: Profitability ratio comparison for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

A clearer picture of the profitability ratios is given of WES and CFR in Figure 4.11 and indicates WES has not been profitable for the period under review. An illustration of the profitability ratios for five consecutive years under review for PAL and SHF is given in Table 4.15.

Table 4.15: Profitability ratios for Pals Holdings vs. Steinhoff International Holdings Limited

Company	Failed					Non-Failed				
	PAL					SHF				
Year	Base Year	Y2	Y3	Y4	Y5	Base Year	Y2	Y3	Y4	Y5
Net Profit Margin %	15.04	-6.20	2.08	-3.49	-8.16	4.64	6.21	10.17	6.45	7.32
Operating Profit Margin %	15.54	-0.74	2.64	-2.69	-5.96	13.37	15.58	10.89	9.07	8.72
Return On Assets %	15.33	-3.75	5.67	-6.78	-12.37	13.78	11.76	9.23	11.09	9.59
Return On Equity %	26.43	-6.69	6.17	-13.01	-36.81	23.69	21.47	22.75	38.03	23.04

Source McGregor BFA (2014) adjusted for own research

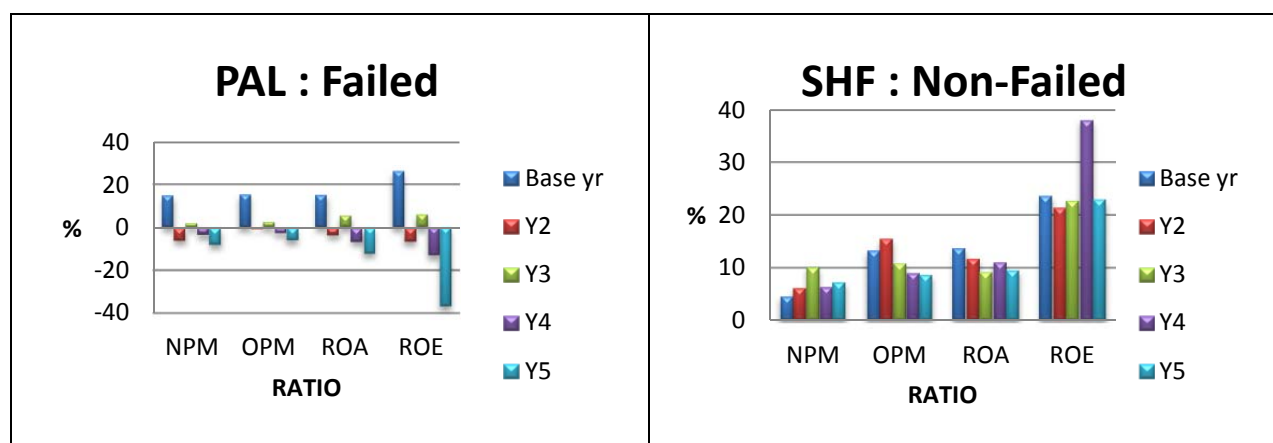
NPM in the base years indicated R1 of sales created R0.15 profit for PAL. In Y2, Y3 and Y5 the ratio was negative and Y3 showed that only R0.02 of profit was created from the sales. In the base year, the ratio is high and low from Y2 to Y5. SHF's ratio showed an increase from base year to Y3, a decline in Y4 and an increase again in Y5. From base year to Y2, Y4 and Y5 fell within an average rate and Y3 moved over to high rate.

PAL's OPM indicated high cost because the ratio was negative in Y2, Y4 and Y5 showing that R1 sales produced R0.02 profit. SHF's ratio fluctuated, but remained positive during the period of review.

ROA for PAL pointed out the assets are not being managed effectively by management as the ratio was negative in Y2, Y3 and Y5. SHF signals for every R1 that has been employed by the company base year R0.13, Y2 R0.11, Y3 R0.09, Y4 R0.11 and Y5 R0.09 in profit was made.

ROE ratio for PAL fell within the high ratio group (>11%) in the base year and in the low ratio group (<6%) in the other years of assessment. For SHF the ROE ratios is >11% for the period under review Figure 4.12 gives a graphic trend analysis for the period under review.

Figure 4.12: Profitability ratio comparison for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

SHF throughout the whole period of assessment, the ratio fell within the high ratio and indicates that the investors' investment within the company is doing well as reflected in Figure 4.12. On the other hand, it is shown that PAL is not profitable. Table 4.16 will report the trend analysis for TIW and SER on a year to year basis.

Table 4.16: Profitability ratios for Tiger Wheels Limited vs. Seardel Investments

Company	Failed					Non-Failed				
	TIW					SER				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	8.42	1.01	4.52	6.37	1.88	2.78	1.91	2.40	8.74	2.61
Operating Profit Margin %	4.75	8.69	8.21	7.45	4.09	6.10	7.13	5.20	3.31	3.94
Return On Assets %	5.85	13.13	11.19	8.75	3.30	8.27	10.99	7.66	4.03	5.04
Return On Equity %	8.94	25.24	22.92	15.98	4.90	8.87	15.15	7.69	2.29	4.87

Source: McGregor BFA (2014) adjusted for own research

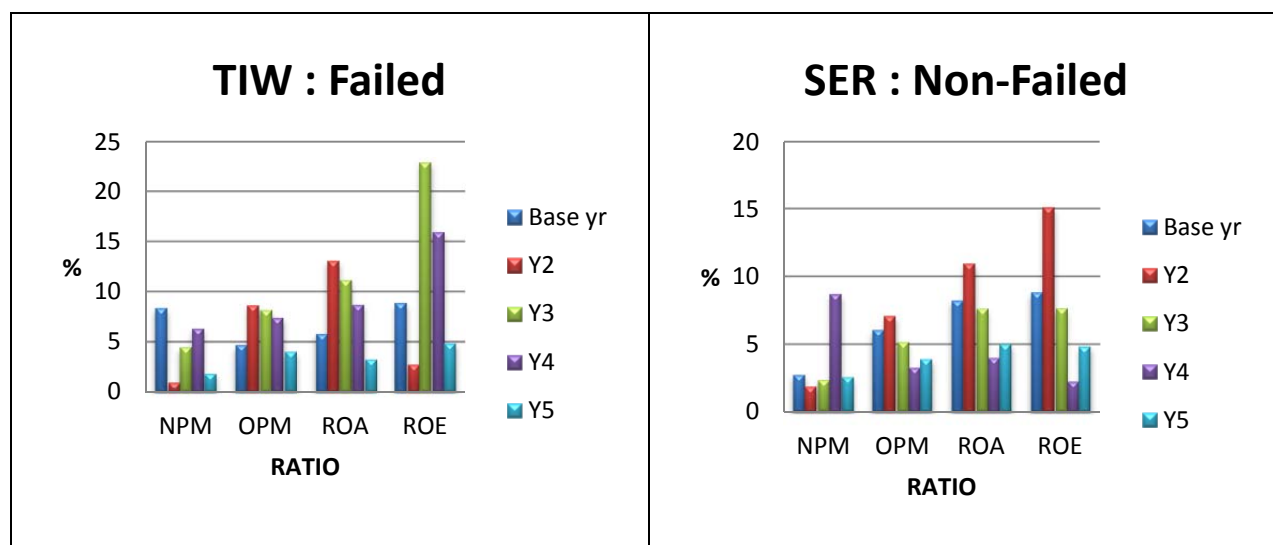
TIW's NPM ratio varied from the base year, from 8% to 1% in Y2, increased to 4% in Y3 and showed a further increase in Y4 to 6%. In Y5 there was a significant drop to 1%. According to the CIMA guide (2009:23), TIW's ratio group was average in the base year and Y4, and low in Y2, Y3 and Y4. SER's ratio declined in Y2 and Y5, meaning costs must have increased, and Y2 indicates R1 of sales will produce R0.019 profit and in Y5, R1 sale will create R0.026 in profits. SER's ratio group was low in the base year to Y3 and average Y4 and Y5.

OPM for TIW increased from base year to Y4 and in Y5 it decreased. SER increased from base year to Y2 and thereafter decreased for the remaining three years. The decrease means cost has increased and the increase could have been due to high debt.

TIW's ROA ratio increased to Y2 and thereafter declined in Y3, Y4 and Y5. The ROA ratio has fluctuated for SER decreased from Y3, and when the ratio decreased, the EBIAT decreased while the total assets increased and visa verse for when the ratio increased.

ROE for TIW varied from a high of 25% in Y2 to a low of 4% in Y5, meaning the investors' investment did well in Y2 at 25%, slightly declined in Y3 to 22%, thereafter worsened to 15% in Y4 and to 4% in Y5. The grouping of the ratio is average in base year, high in Y2 to Y4 and low in Y5. The fluctuation of SER's ratio could indicate an increase in cost in the year the ratio decreases, which was in Y3 to Y5 and fell within the average ratio group (8-11%) in the base year and Y3, in the high ratio group (>11%) in Y5 and the low ratio group (<6%) in Y4 and Y5. The information in Table 4.16 is illustrated in Figure 4.13 below.

Figure 4.13: Profitability ratio comparison for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

The effect of the profitability ratios is explained in Figure 4.13. The TIW's ROA increases to more than double in Y2 and drops more than four times in Y5, while the ROE increases three times in Y2, but declines six times in Y5. In Tables 4.17 and 4.18 the profitability ratios of the consumer service industry will be looked at.

4.8.2 Consumer Services

Table 4.17: Profitability ratios for Retail Apparel Group Limited vs. Shoprite Holding Limited

Company	Failed					Non-Failed				
	RAG					SHP				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	8.22	7.29	1.65	-20.90	-22.05	2.21	2.24	0.82	1.32	1.26
Operating Profit Margin %	15.68	13.56	11.36	4.39	-6.50	3.46	2.84	1.72	2.01	2.27
Return On Assets %	12.70	12.01	10.22	3.09	-8.66	9.50	7.96	5.38	6.61	6.74
Return On Equity %	17.74	16.99	5.84	-21.10	-99.88	30.62	30.72	15.56	16.73	26.22

Source: McGregor BFA (2014) adjusted for own research

RAG's NPM declined from 8% to 1% from base year to Y3, thereafter had a negative ratio in Y4 and Y5. Ratio for SHP declined in Y3 and had a slight increase and decreased in Y4 and Y5.

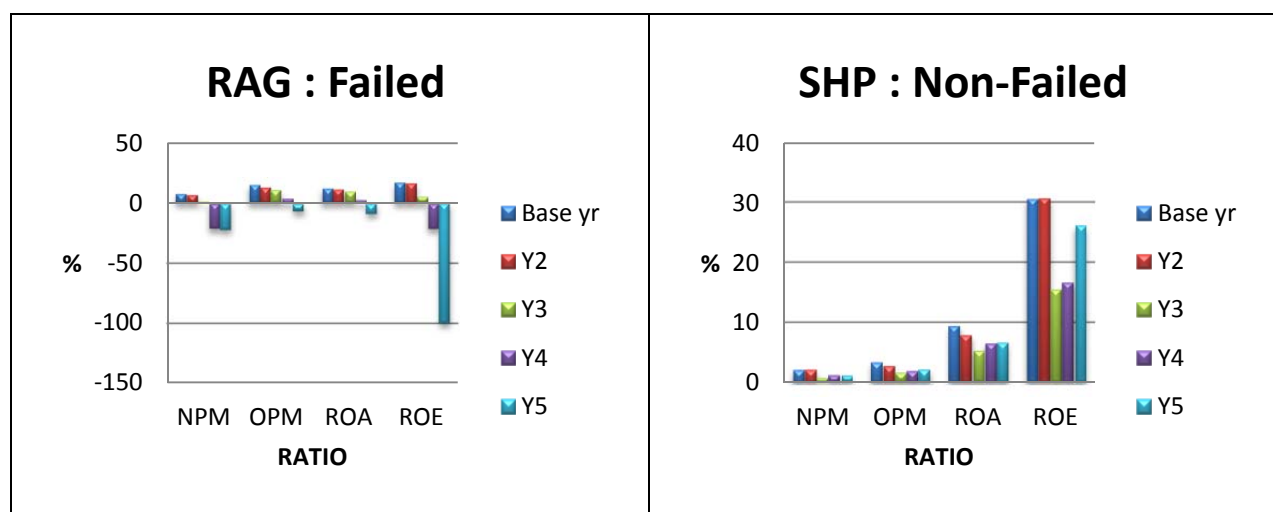
There was a gradual decline from the base year to Y3, then a major decrease in Y4 and Y5 to negative ratio for OPM; the EBIT in Y4 and Y5 was negative and caused the negative ratio in Y4 and Y5 for RAG. SHP's ratio declined from the base year to Y3, meaning the cost increased and the ratio increased in Y4 and Y5.

ROA of RAG decreased from base year to Y3 and shows that for the assets employed in the company, less profit has been made and in Y5 the ratio was negative. SHP's ROA also declined, meaning the assets have been managed less effectively from the base year to Y3, in Y4 and Y5 the ratio increased indicating an increase in the assets management.

ROE decreased in Y3 and showed a negative ratio in Y4 and a very high negative ratio in Y5, due to the decrease of the net income from Y2 to Y5. The equity increased from the base year to Y2 and then continually declined till Y5. In Y3, the ratio dropped because the net income decreased and the equity increased, causing the ratio to drop.

In Y4 negative net income divided by the positive equity resulted in a negative ratio. The negative ratio increased in Y5 because negative net income increased negatively and the equity declined yet was still positive, furnishing a higher negative ratio outcome. In RAG the investors' investment is not doing so well. Investors might start looking elsewhere for investment opportunities. SHP's ratio indicates no concerns. The graphical layout will be depicted in Figure 4.14 below.

Figure 4.14: Profitability ratio comparison for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.14 it can be observed that RAG is not profitable, whereas SHP's profitability ratios are healthy. Table 4.18 will showcase TRX and WHL's profitability trends for the period under evaluation.

Table 4.18: Profitability ratios for Terexko Limited vs. Woolworths Holding

Company	Failed					Non-Failed				
	TRX					WHL				
Year	Base Year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	93.54	14.08	13.37	-183.32	-1.78	9.46	4.38	3.92	3.84	3.81
Operating Profit Margin %	7.66	14.53	13.52	-2.55	1.27	13.73	7.88	6.96	6.77	7.49
Return On Assets %	3.04	4.53	4.84	-2.36	1.07	18.38	11.87	9.55	7.73	10.39
Return On Equity %	3.17	5.93	5.74	4.28	1.73	25.93	13.81	11.96	9.96	15.43

Source McGregor BFA (2014) adjusted for own research

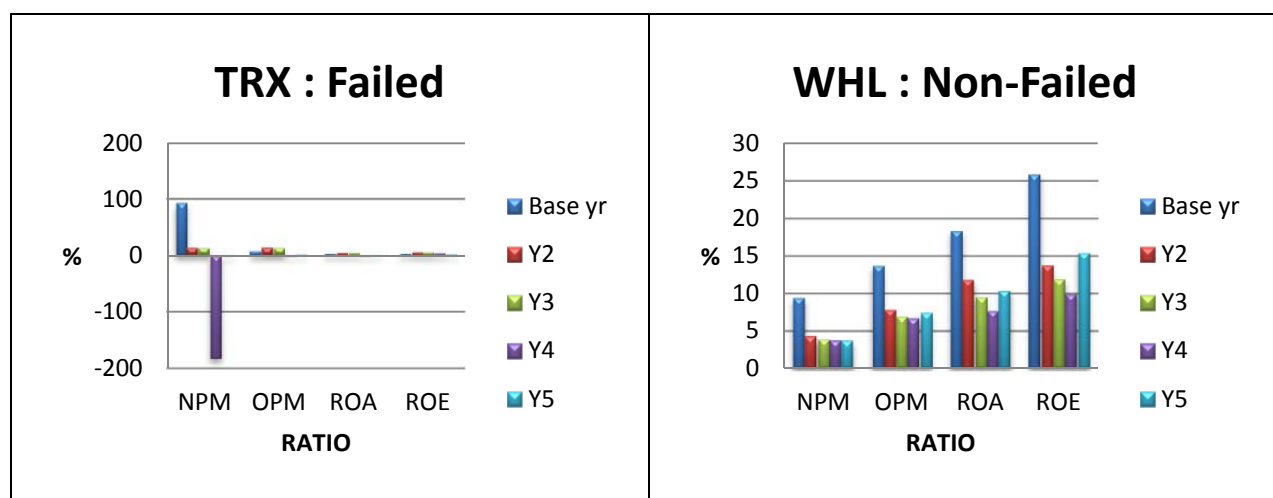
Both TRX and WHL's NPM ratios declined, but TRX was negative in Y4 and Y5, whereas WHL remained positive even though they declined. The profit after tax for TRX decreased in Y2, slightly increasing in Y3 and declined in Y4 and Y5, due to the extraordinary profits in base year and no extraordinary profits in Y2 and Y3. In Y4 and Y5 TRX had extraordinary losses, causing the profit after tax to be negative. The negative ratio was higher in Y4 than in Y5, due to the higher extraordinary loss in Y4 than in Y5. The NPM ratio grouping for TRX is high in the base year to Y3 and low in Y4 and Y5 and WHL's ratio is at an average from base year to Y5.

The OPM ratio for TRX increased in Y2 and declined slightly in Y3, Y4 was a negative ratio and Y5 was 1% which is not a good indication. WHL also declined, yet did not go below the 6% mark.

ROA of TRX signals that the assets are not being managed effectively if managed at all, the ratio is very low throughout the duration of the period of study, negative in Y4 and 1% in Y5. WHL declined in Y2 to Y4 and increased in Y5. At the lowest ratio in Y4, for every R1 assets employed, R0.077 profit is created.

ROE for TRX increased from the base year, declined in Y4 and showed a further decline in Y5. The ratio for the whole period fell within the low ratio group (<6%). WHL's ratios fluctuated from falling within the high ratio group (>11%) in base year, Y2, Y3 and Y5 and in the average ratio group (8-11%) in Y4 at 9%. Figure 4.15 presents the results of the profitability ratios in TRX and WHL.

Figure 4.15: Profitability ratio comparison for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

It can be viewed in Figure 4.15 that TRX's NPM has declined significantly from Y2 to Y5 in which it was a huge negative ratio. In Tables 4.19 and 4.20 the profitability ratio of the industrial industry will be looked at.

4.8.3 Industrial

Table 4.19: Profitability ratios for Northern Engineering Industries Limited vs. Howden Africa Holding

Company	Failed					Non-Failed				
	NEI					HWN				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	5.70	2.37	3.65	4.51	3.37	8.74	6.97	4.86	0.93	1.37
Operating Profit Margin %	4.92	3.86	6.17	6.93	4.41	12.35	12.42	10.07	7.84	9.32
Return On Assets %	9.46	6.58	8.66	10.36	5.78	15.81	16.43	12.55	9.76	12.65
Return On Equity %	15.75	11.88	16.07	15.65	8.67	35.66	22.97	15.07	5.55	4.12

Source: McGregor BFA (2014) adjusted for own research

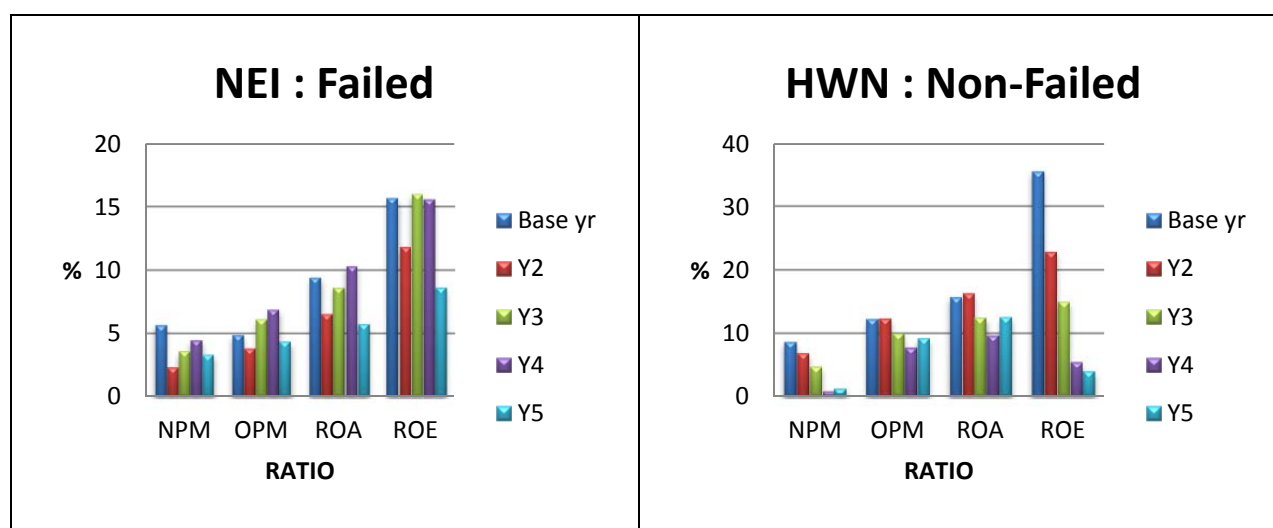
There was a gentle fluctuation in the NPM ratio for NEI and the maximum was at 5% and 2% at the lowest percentage, resulting in the ratio levels to be average in base year, and Y3 to Y5 and low in Y2. HWN's NPM also declined but remained positive, causing the ratio level to be average in the base year to Y3 and low in Y4 and Y5.

OPM ratio for NEI signaled an increase in cost causing the EBIT to decrease when the ratio decreased in Y2 and Y5, and the cost decreased in Y3 and Y4 when the ratio increased. In Y3, HWN's OPM ratio decreased with a further decrease in Y4 and a faint increase in Y5.

ROA indicates NEI's assets management has declined in Y2 (6%) and then management improved in Y3 (8%) and kept on improving in Y4 (10%), and declined in Y5 (5%). HWN varied, increased in Y2 and Y5 and decreased in Y3 and Y4.

As per CIMA guide (CIMA, 2009:24) the ROE of NEI was within the high ratio category from base year till Y4 (>11%) and declined to the average group category for Y5 (8-11%). HWN's ratio from the base year till Y3 was within the high ratio group and in Y4 and Y5 the ratio fell within the low ratio group (<6%), meaning the shareholder investment deteriorated. A graphical presentation is given in Figure 4.16.

Figure 4.16: Profitability ratio comparison for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

From Figure 4.16 it can clearly be seen that both NEI and HWN have fluctuated over the period under investigation and in Table 4.20, DLG and WKF's profitability trends over the five financial years will be evaluated.

Table 4.20: Profitability ratios for Dialogue Group Holding Limited vs. Workforce Holding

Company	Failed					Non-Failed				
	DLG					WKF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Net Profit Margin %	13.02	7.92	-12.76	-25.30	23.46	2.82	3.73	1.02	1.13	1.39
Operating Profit Margin %	18.04	10.57	-4.65	-20.45	14.59	4.96	5.91	3.64	3.12	2.88
Return On Assets %	23.62	10.59	-11.07	-44.73	21.93	12.41	14.40	11.69	8.45	8.43
Return On Equity %	32.71	90.39	-27.57	-1447.9	39.96	16.63	36.18	13.07	11.39	13.19

Source: McGregor BFA (2014) adjusted for own research

The NPM ratio for DLG was negative in Y3 and Y4, while in Y2 the ratio decreased and in Y5 it increased. The financial statements have shown the rational for the negative ratio in Y3 and Y4, due to the extraordinary losses DLG had for that period with a slight decline in sale from Y3 to Y4. DLG moved from high rate in base year and Y5, average in Y2 and low in Y3 and Y4 is the result of the increased negative ratio. WKF's ratio increased in Y2 and Y3 to Y5 when the ratio decreased (it was very minor). WKF's ratio level was low in the base year, Y3 to Y5 and average in Y2.

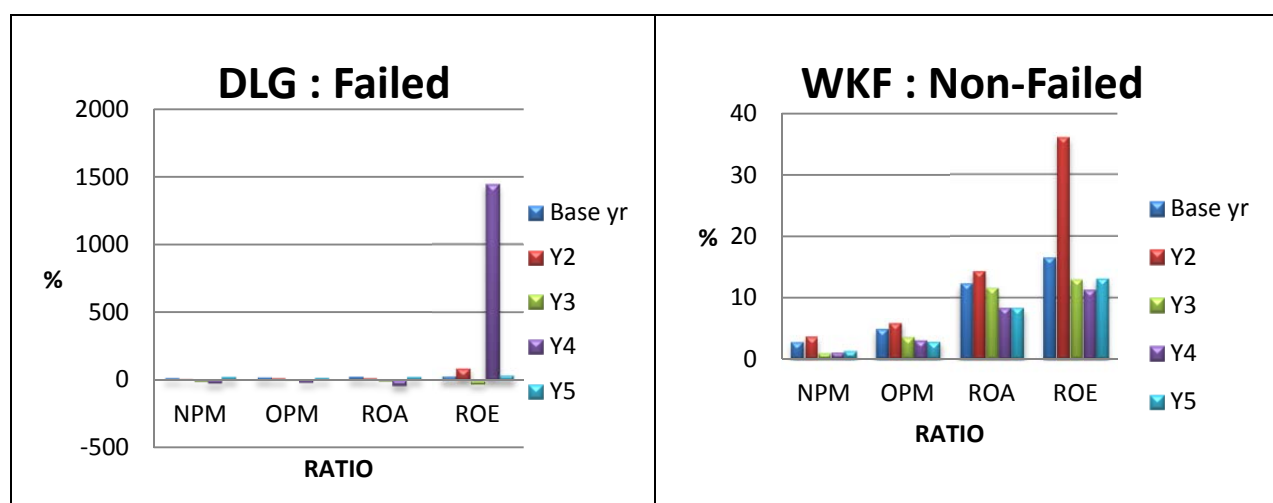
DLG's OPM ratio decreased in Y2, was negative in Y3 and Y4 due to the extraordinary losses suffered for that time period, and increased in Y5. WKF's ratio increased to Y2 (5%) from 4% in the base year and decreased from Y3 to Y5, 3% to 2%.

The extraordinary losses for Y3 and Y4 affected the ROA for DLG negatively. There was also a decline in Y2 and an increased in Y5, with the total assets declining from Y3 to Y5. WKF increased in Y2 and decreased from Y3 to Y4 with a slight increase in Y5, and remained positive.

ROE for DLG was also negative for Y3 and Y4, increasing in Y2 and Y5. The negative ratio in Y3 was as a result of the extraordinary losses (negative divided by positive

results in a negative). In Y4, DLG had an unusually high negative ratio with the same mathematical rational as in Y3, which was brought upon by the extraordinary losses and a 94% decline in the equity from Y3 to Y4. WKF fell within the high ratio group (>11%) throughout the whole period under review. A portrayal of the graphic layout is given in Figure 4.17.

Figure 4.17: Profitability ratio comparison for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

The conclusion drawn from Figure 4.17 is that DLG has not been profitable since Y3. In conclusion, 50% of the failed company's profitability ratios are better and also contain abnormal ratios compared to the non-failed companies. The SOCI is manipulated by the extraordinary items which are once off and make the SOCI either look better when it is an extraordinary profit or worse when it is an extraordinary loss. The trend of the assets management will be looked at next for the three industries during five consecutive periods.

4.9 TREND ANALYSIS – ASSET MANAGEMENT

Smart and Graham (2012:42) describe asset management as a measuring tool to measure how rapidly a company can transform different accounts into sales or cash. Grossman and Livingstone (2009:21) advise that the quicker the company's turnovers ratios are, the lower the need for the company to increase their assets to deal with the increased activities. The liquidity will be upgraded, as less cash will be tied up in assets due to the asset turnover. In this study only total asset turnover (TATO), accounts receivable turnover (ARTO) and inventory turnover (ITO) will be looked at.

The trends of asset management ratios will be monitored in Tables 4.21-4.28 below for both failed and non-failed companies. This will be conducted for the industries within this study for the five year period of enquiry, beginning from the base year to Y5. The total assets turnover (TATO) ratio determines how proficient company assets are used to create sales. Next, the account receivable turnover (ARTO) ratio will be assessed as this ratio evaluates the average period a company needs to wait for payment on their sales after the sales have been made. If the ratio is 10 on average, the accounts receivable move or are replaced 10 times per year, meaning they are replaced every 36 days. Grossman and Livingstone (2009:22) say it is important for the company's credit term to be in line with the accounts receivable. The higher ratio indicates that a company is more effective in handling their accounts receivable. CIMA (2009:24) gives a guide regarding accounts receivable, but it will differ from industry to industry

- Low: under 55 days
- Average: 55-85 days
- High: over 85 days

Finally the inventory turnover (ITO) ratio will be analysed as this ratio signals how speedily a company sells their inventory. The lower the ratio signals that a company is holding too much inventory (obsolete) which can be costly as the company will have to pay for storage, the higher this ratio gestures that there is no obsolete stock or a gathering of damaged goods (Correia *et al.*,2011:5.14). Table 4.21 below was constructed to indicate the asset management ratios starting with Total Asset Turnover (TATO) followed by Accounts Receivable Turnover (ARTO) and finally Inventory Turnover (ITO) in order to compare ALC and MTA within the consumer goods industry.

4.9.1 Consumer Goods

Table 4.21: Asset Management ratios for Amlac Limited vs. Metair Investment Limited

Company Name	Failed					Non-Failed				
	ALC					MTA				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	2.00	1.33	1.62	1.62	1.12	1.94	1.67	1.52	1.59	1.70
Accounts Receivable turnover	70.65	80.67	75.17	68.52	67.62	50.39	41.81	52.47	58.37	60.63
Inventory turnover	8.20	5.10	6.04	6.17	7.58	5.69	6.33	4.84	5.43	5.51

Source: McGregor BFA (2014) adjusted for own research

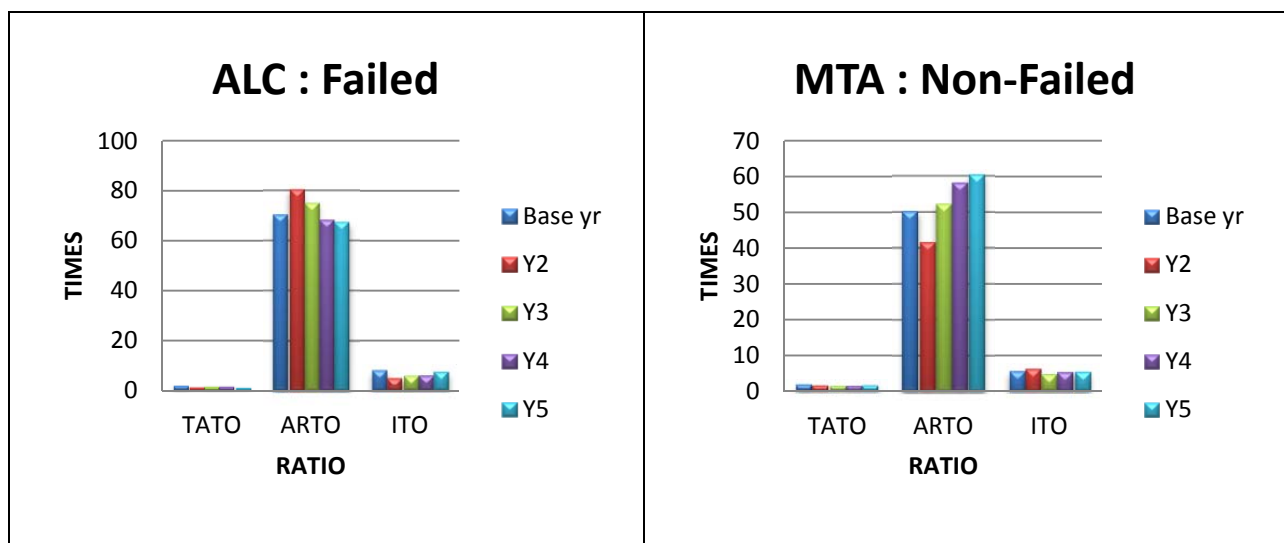
The TATO ratio for ALC experiences a decline from base year up to Y5, excluding Y3 and Y4, whereby the ratio remained unchanged. Even though there is a decrease in the assets effectiveness, sales were still being created. In the base year sales were twice the total assets, Y2 sales werer 1.3 times the total assets, Y3 1.6 times, remaining at 1.6 times in Y4 and declined in Y5 to sales being 1.1 times the total assets. MTA's TATO has declined from 1.9 times to 1.6 times in Y2 and 1.5 times in Y3 and Y4. In Y5 TATO ratios grew to 1.7 times.

ALC's ARTO ratio alternated from 70 times that the account receivables were turned over in the base year and increased to 80 times in Y2. From Y3 to Y4 the ratio dropped by 6% to 9% and there was a further 1% drop in the turnover in Y5. Regardless of the decline, the ratio performance was still better than the non-failed company. MTA's ARTO ratio was 50 times in the base year, meaning the average account receivable is turned over 50 times per year in the base year, 41 times in Y2, 52 times in Y3. An increase to 58 times in Y4 occurred and a further increase to 60 times per year. According to the CIMA guide (CIMA, 2009:24) this indicates ALC's ARTO is at an

average throughout the five year period and MTA is low in the base year to Y3, and average in Y4 and Y5.

ITO ratio indicates the number of times inventory is being sold or replaced and ALC's ITO ratio varied throughout the five year financial period. In the base year, the number of times inventory is being sold, changed from 8 times to 5 times in Y2, 6 times in Y3 and Y4 and 7 times in Y5. MTA's inventory was replaced 5 times in the base year, 6 times in Y2, 4 times in Y3, 5 times in Y4 and remained at 5 times in Y5. The graphic layout will be depicted in Figure 4.18 below.

Figure 4.18: Asset management ratio comparison for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.18 the fluctuation of the ratios over the five year period under review can visibly be observed. Table 4.22 will showcase WES and CFR's asset management trend for the period under evaluation.

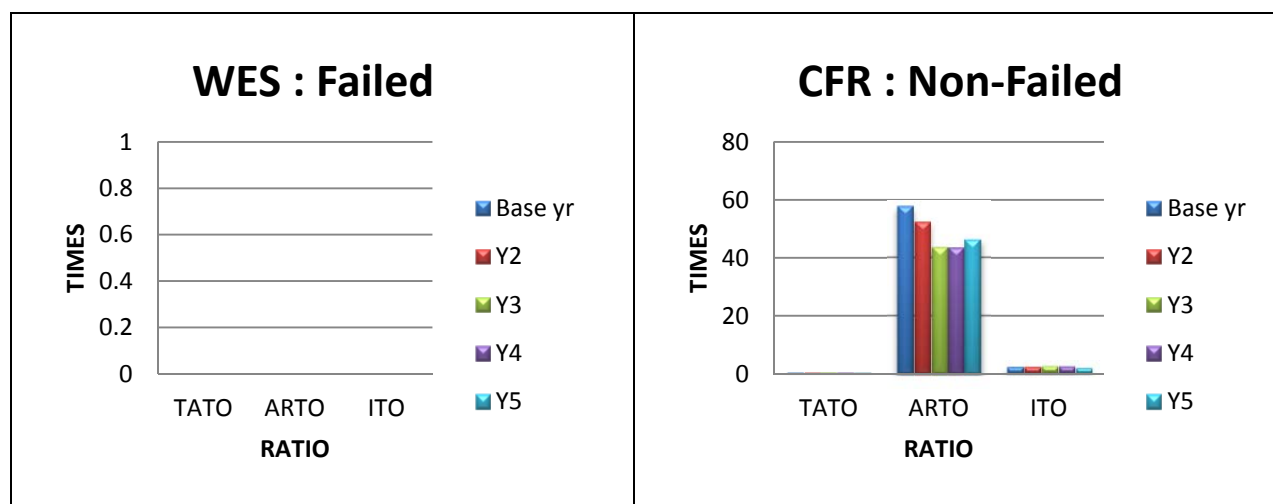
Table 4.22: Asset Management ratios for Wesco Investments Limited vs. Compagnie Financiere Richemont

Company Name	Failed					Non-Failed				
	WES					CFR				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.52	0.50	0.45
Accounts Receivable turnover	0.00	0.00	0.00	0.00	0.00	57.97	52.54	43.82	43.69	46.39
Inventory turnover	0.00	0.00	0.00	0.00	0.00	2.41	2.44	2.63	2.59	2.02

Source: McGregor BFA (2014) adjusted for own research

All three ratios represented under the asset management ratio category indicate that WES has no turnover and mathematically an amount multiplied or divided by zero will have a zero result. Their assets have not been used if they have any, the account receivables have not been turned over and the inventory is neither being sold nor replaced. By screening the ratios of CFR, it has been signaled that the ratios are fluctuating, but the fluctuations are not alarming. It shows that the sales are 0.5 times the assets in the base year to Y4 and 0.4 times in Y5. The ARTO ratio of CFR points out a decrease in the ratio and suggests the time between sales and collections are longer, as it takes longer to replace. The ratio decreased from the base year to Y2. In Y3 there was another decrease which stayed the same in Y4 and increased in Y5. The ITO ratio reflects that the replacement or sale of inventory remained consistent at 2 times throughout the full period under review. Figure 4.19 presents the results of the ratios in WES and CFR.

Figure 4.19: Asset management ratio comparison for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

It can be viewed in Figure 4.19 that WES has no assets to manage and CFR has minor variations in the ratios. Table 4.23 illustrates the management of the assets for the five year period under review.

Table 4.23: Asset Management ratios for Pals Holdings vs. Steinhoff International Holdings Limited

Company Name	Failed					Non-Failed				
	PAL					SHF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	1.70	2.22	2.15	2.13	2.08	1.09	0.82	0.95	1.37	1.38
Accounts Receivable turnover	89.00	62.42	55.23	63.38	82.54	90.61	120.46	105.46	66.95	61.80
Inventory turnover	6.81	6.38	6.55	5.22	5.93	11.13	7.84	6.51	9.80	10.62

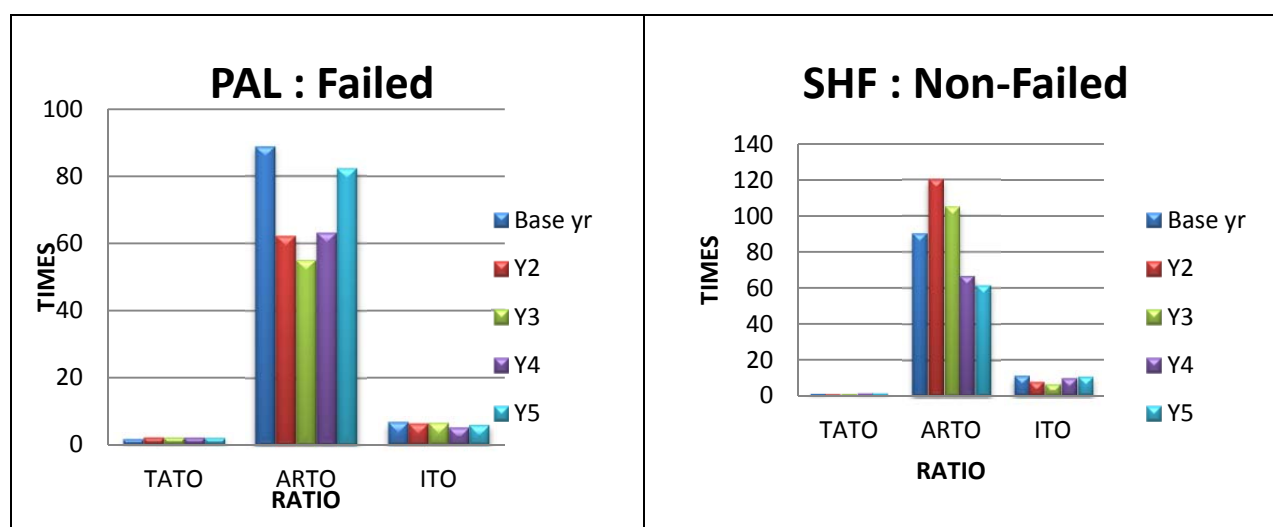
Source: McGregor BFA (2014) adjusted for own research

PAL's TATO ratio has increased from the base year and remained slightly constant at 2 times throughout the period under investigation. SHF's ratio has declined in comparison to the base year and then increases in Y3, Y4 and Y5.

The ARTO ratio of PAL decreased from the base year at about 30% and experienced another decrease in Y3. In Y4 the ratio increased and there was another estimated 30% increase in Y5. PAL's ratio level in base years was high and at an average of Y2 to Y5. SHF increased till Y2: in the base year it was 90 times, in Y2 120 times. It then declined to 105 times in Y3, 66 times in Y4 and had another decline of 61 times in Y5. From base year to Y3, SHF is indicated as having a high ratio and remaining at an average in Y4 and Y5 according to the CIMA guide (CIMA, 2009:24).

PAL's ITO ratio remained at 6 times from its base year to Y3, then declined to 5 times in Y4 and Y5. In the base year for SHF, the ITO has shifted from 11 times to 7 times in Y2, 6 times in Y3 the progressed from 9 times to 10 times in Y4 to Y5. A graphical presentation is given in Figure 4.20 below.

Figure 4.20: Assets management ratio comparison for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

The trend analysis for PAL and SHF is graphically arranged from the base year to Y5 and nothing out of the ordinary can be seen. Table 4.24 will report the trend analysis for TIW and SER.

Table 4.24: Asset Management ratios for Tiger Wheels Limited vs. Seardel Investments

Company Name	Failed					Non-Failed				
	TIW					SER				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	1.35	1.66	1.64	1.44	1.10	1.40	1.57	1.52	1.50	1.38
Accounts Receivable turnover	87.50	61.18	55.45	49.44	65.12	80.98	70.30	70.33	69.18	69.70
Inventory turnover	5.65	6.95	7.86	6.82	6.50	4.78	5.11	5.29	5.60	5.00

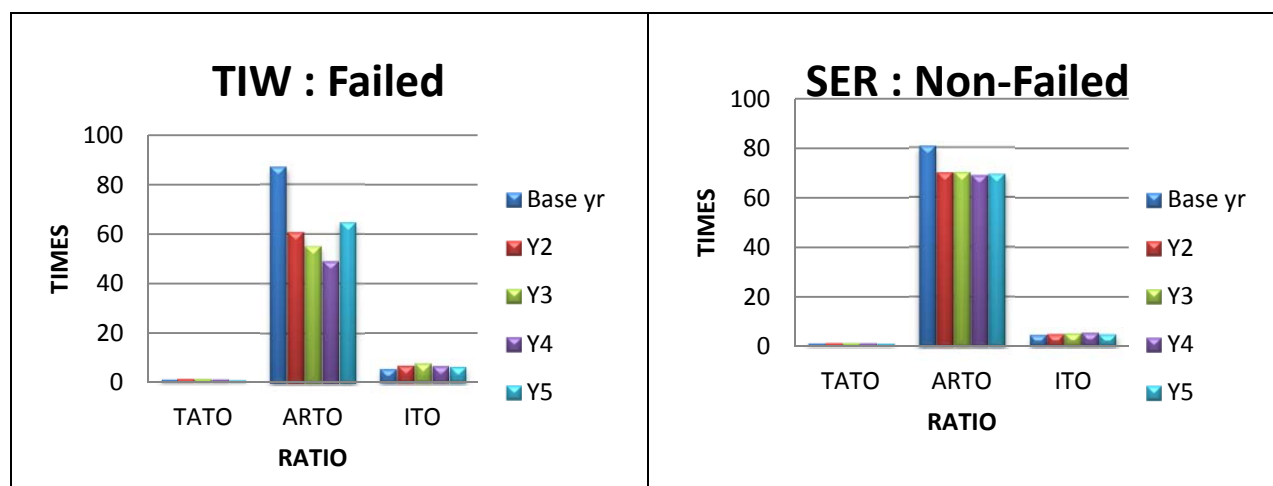
Source: McGregor BFA (2014) adjusted for own research

TATO ratio increased from the base year to Y3 for TIW, 1.3 times in base year and 1.6 in Y2 and Y3. In Y4 and Y5 it declined from 1.4 to 1.1 times. SER's ratio increased was from the base years to Y4 and in Y5 it dropped. In the base years it was 1.4 times and 1.5 times in Y2, Y3 and Y4. In Y5 the ratio fell to 1.3 times.

The base year of TIW's ARTO ratio, according to CIMA's guide, falls within the high ratio group (over 85 days), Y2 and Y3 are under average (55–85 days), Y4 is low (under 55 days) and Y5 at an average. SER's ARTO ratio fell within the average (55-85 days) group for the entire five financial years under review.

The ITO ratio for TIW was 6 times in Y2 from 5 times in the base year, 7 times in Y3 and declined in Y4 to 6 times where it remained in Y5. A raise in the ratio from base year which was at 4 times for SER and increased to 5 times in Y2, remaining at 5 times for the duration of the period under investigation. Figure 4.21 graphically presents those ratios contained in the table above.

Figure 4.21: Asset management ratio comparison for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

From Figure 4.21 it can clearly be seen that both TIW and SER have fluctuated over the period under review, and in Tables 4.25 and 4.26 the assets management trend over the five financial years will be assessed for the consumer service industry.

4.9.2 Consumer Services

Table 4.25: Asset Management ratios for Retail Apparel Group Limited vs. Shoprite Holding Limited

Company Name	Failed					Non-Failed				
	RAG					SHP				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	1.02	1.09	0.98	1.13	1.24	3.77	3.04	3.35	3.56	3.21
Accounts Receivable turnover	243.05	230.30	237.96	189.71	166.45	11.07	33.69	26.78	22.29	22.50
Inventory turnover	5.95	7.34	5.81	6.49	8.03	10.11	7.05	8.28	8.68	9.01

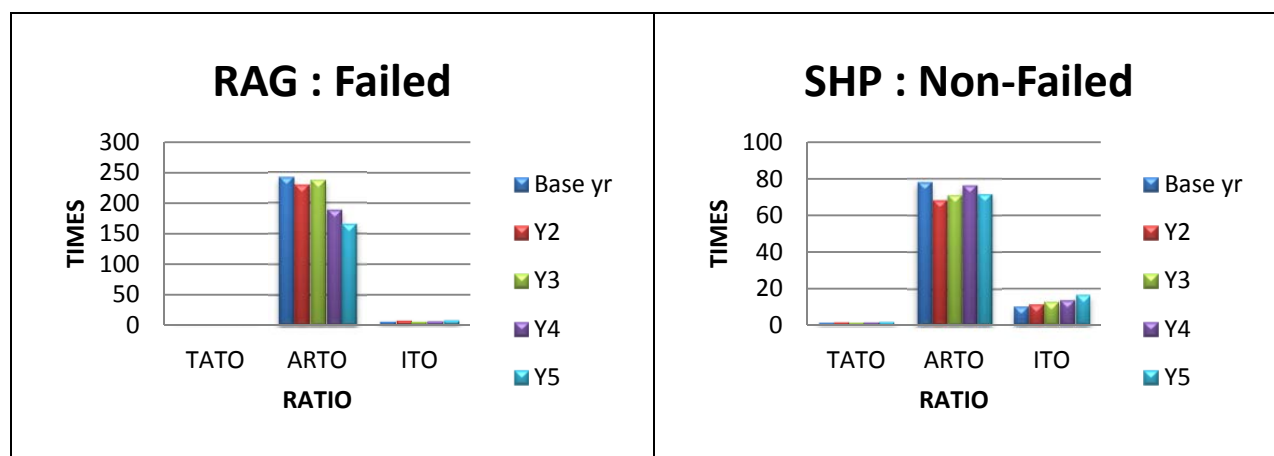
Source: McGregor BFA (2014) adjusted for own research

In the consumer services industry, the TATO ratio, varied for RAG. It vaguely increased in Y2 from 1.01 times in the base year to 1.09 times in Y2, dropped to 0.98 times in Y3, increased to 1.13 times in Y4 and declined to 1.24 times in Y5. SHP's ratio fluctuated slightly, remaining at 3 times from base year till Y5.

ARTO remained in the 200 times range from the base year to Y3 for RAG. The base year was at 243 times, 230 times to 237 times in Y2 to Y3 and declined in Y4 and Y5 from 189 times to 166 times. For the five year period, CIMA guide (2009:24) indicates the ratio level is high. SHP's ARTO ratio fluctuated from the base year at 11 times to 33 times in Y2, 26 times in Y3 and remaining at 22 times in Y4 and Y5. For the duration of the period, SHP's ratio level remains at a low rate.

The rise and fall of the ITO ratios in RAG have occurred in the range 5 up to 8 times. In the base year and Y3 it was at 5 times, 6 times in Y4, 7 times Y2 and 8 times Y5. SHP's ratio plunged to 7 times in Y2 from 10 times in the base year, remaining at 8 times in Y3 and Y4 and 9 times in Y5. Figure 4.22 below graphically supports the above interpretation.

Figure 4.22: Asset management ratio comparison for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

Figure 4.22 graphically indicates that the account receivable from the base year till Y5 for RAG is unusually high. Table 4.26 displays the asset management effectiveness of TRX and WHL.

Table 4.26: Asset Management ratios for Terexko Limited vs. Woolworths Holding

Company Name	Failed					Non-Failed				
	TRX					WHL				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	0.42	0.32	0.36	0.93	0.84	1.78	1.99	1.82	1.87	2.14
Accounts Receivable turnover	269.31	66.93	127.85	7.82	8.79	78.44	68.56	71.30	76.67	71.84
Inventory turnover	89.21	47.19	57.41	56.09	33.10	10.51	11.70	13.10	13.94	16.86

Source: McGregor BFA (2014) adjusted for own research

TRX's TATO remained positive even though the time was at 0.4 times minimum to a maximum of 0.8 times for the period. WHL's ratio was consistent at 1 time from the base year to Y4, then grew to 2 times in Y5.

Of the 365 days a year, TRX's ARTO ratio shows in the base year that TRX's accounts receivables are replaced on average 269 times a year meaning it is replaced in less than 2 days. In Y2 there was a drastic decline to 66 times and an increase to 127 times in Y3, falling to 7 times and 8 times in Y4 and Y5. Rule of thumb indicates that the higher the ratio, the better, but if it is too high it should be alarming. TRX's ARTO is at a high level in the base year and Y3, average level in Y2 and extremely low in Y4 and Y5. WHL's ARTO ratio varied, from the base year through to Y5. From the base year to Y2 there was a 12% increase and from Y2 to Y3 a 4% plunge. Thereafter the ratio remained in the 70 times range. WHL's ARTO is within the average level range (55-85 days) throughout the review period.

The ITO ratio plummeted from 89 times to 47 times in Y2, 57 times in Y3, 56 times in Y4 and a 41% decline in Y5 for TRX. There is a consistent increase in WHL's ratio which is a good indication, meaning WHL is replacing or selling more often, at 10 times in the

base year, 11 times in Y2, 13 times in Y3 and Y4, and 16 times in Y5. Figure 4.23 below adds visual meaning to the ratio of TRX and WHL.

Figure 4.23: Asset management ratio comparison for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

The outcome of the asset management ratio of TRX and WHL is explained in Figure 4.23, indicating an abnormal accounts receivable turnover ratio for TRX. In Table 4.27 and 4.28 the asset management ratio of the industrial industry will be looked at.

4.9.3 Industrial

Table 4.27 Asset Management ratios for Northern Engineering Industries Limited vs. Howden Africa Holding

Company Name	Failed					Non-Failed				
	NEI					HWN				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	1.99	1.84	2.08	1.79	1.63	1.53	1.80	1.76	1.69	1.62
Accounts Receivable turnover	51.98	55.32	60.89	50.59	75.49	126.75	75.94	81.08	76.12	88.79
Inventory turnover	6.76	6.98	7.29	5.57	5.62	5.32	6.48	6.11	7.04	6.42

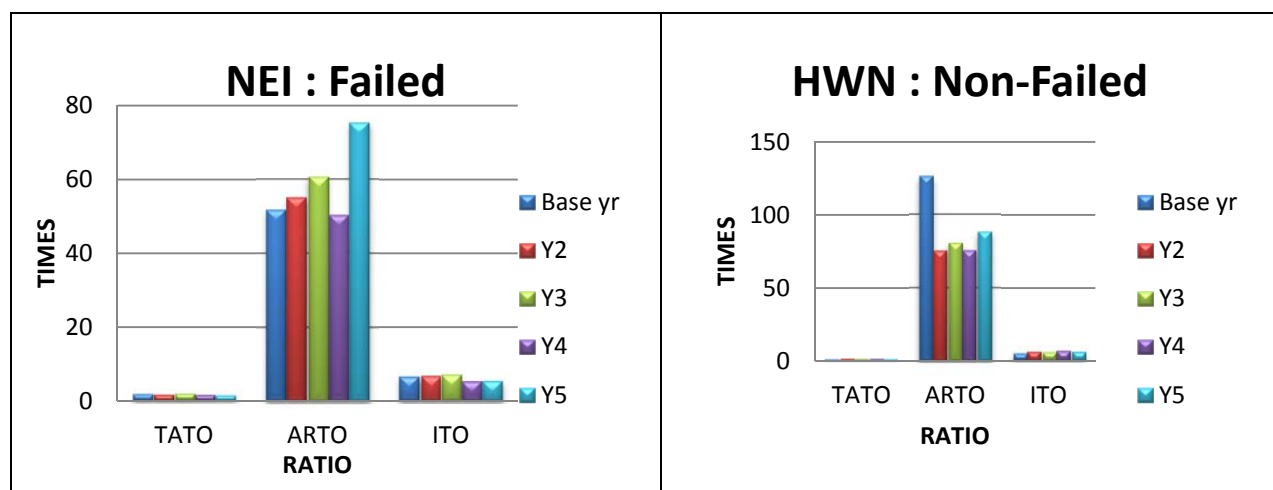
Source: McGregor BFA (2014) adjusted for own research

Changeability in the TATO ratio during the whole period for NEI, from one time in the base year and Y2, Y3 increased to 2 times, then in Y4 and Y5 ratio dropped to one time again. HWN experienced minor changes throughout the period remaining consistent at 1 time.

According to CIMA guide (CIMA, 2009:24) the base year and Y4 of NEI's ARTO ratios fell within the low ratio group (<55days) and the other Y2, Y3 and Y5 fell within the average group (55-85days). For HWN the base year and Y5 appeared in the high ratio group (>85 days). Y2, Y3 and Y4 were within the average group (55-85 days).

NEI's ITO ratio increased from 6 to 7 times from the base year to Y3, in Y4 and Y5 the ratio declined to 5 times. HWN's ITO ratio, the replacement or sales of inventory progressed from 5 times in the base year to 6 times in Y2 and remaining at 6 times in Y3. In Y4 there was a further rise in the ratio to 7 times which dropped to 6 times in Y5. Figure 4.24 gives a graphic demonstration of the trend analysis for the period under review.

Figure 4.24: Asset management ratio comparison for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

Throughout the whole period of assessment, Figure 4.24 revealed that there is no sign for concern for all the ratios reflected above and the management of the assets for DLG and WKF is shown in Table 4.28 below.

Table 4.28: Asset Management ratios for Dialogue Group Holding Limited vs. Workforce Holding

Company Name	Failed					Non-Failed				
	DLG					WKF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Total Assets Turnover	1.85	1.29	1.84	1.99	1.94	3.05	2.77	3.53	3.12	3.40
Accounts Receivable turnover	48.39	84.91	40.95	40.39	15.16	89.43	97.98	86.42	77.42	78.15
Inventory turnover	0.00	0.00	272.71	302.81	0.00	0.00	1056.68	1302.23	757.56	888.10

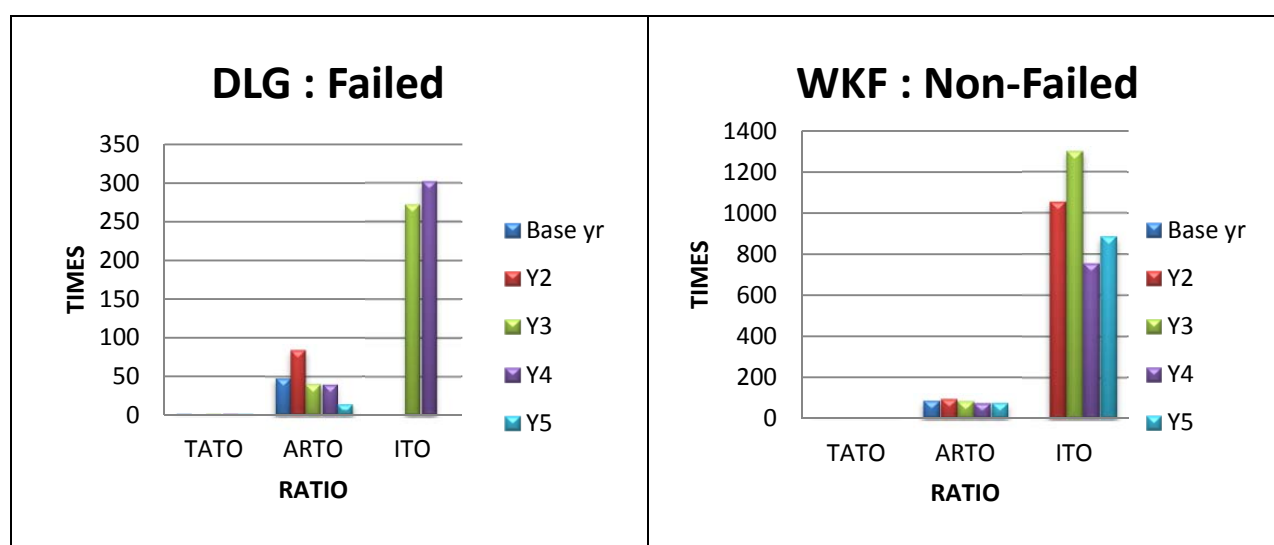
Source: McGregor BFA (2014) adjusted for own research

A slight decline in Y2, from base year till Y5, and the TATO ratio of DLG remained at 1 time throughout the period. There was also a minor decline in Y2 for WKF and then it remained at 3 times in the base year and Y3 to Y5.

A 75% increase in the ARTO ratio for DLG occurred in Y2 in from the base year, a 52% plunge in Y3 to 40 times and remaining at 40 times in Y4. In Y5 with a 63% decrease, the ratios were in the low group (<55days) in the base year, Y3 to Y5, and in Y2 was within the average group (55-85 days) in accordance with the CIMA guide (CIMA, 2009:24). A 11% increase in Y2 and 11% decrease in Y3 and remained in the 70 times range in Y4 and Y5 for WKF placing the base year to Y3 in the high ratio group (>85 days) and Y4 and Y5 in the average group (55-85 days).

The ratios for DLG indicate no inventory was either sold or replaced in base year Y2 and Y5 and suddenly there was a quantum ITO ratio of 272 times in Y3 and 302 times in Y4. In the base year of WKF no inventory was sold or replaced; in Y2 it reached a high of 1056 times, 1302 times in Y3, 757 times in Y4 and 888 times in Y5. The nature of WKF's business plays a huge role as the company provides staffing outsourcing services. The information in Table 4.28 is reflected in Figure 4.25.

Figure 4.25: Asset management ratio comparison for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

An illustration of the asset management ratio for five consecutive years under review for DLG and WKF is given in Figure 4.25 above. The debt management ratio will now be assessed for the industries included within the sample. Of the eight paired companies

under review, five of the failed company's asset management ratios were better than non-failed companies'. From the examination of the financial statement it was found when sales increase or decrease, the assets, debtors and inventory also increased or decreased. The only difference is the increase or decrease of the assets and inventory is more than twice or three times the increase or decrease of the sales. These variations cause the ratio to increase. In the case of the ARTO the debtor's substantial increase is also the reason for the higher ratios. When the ARTO is more than 183 days it indicates accounts receivable are collected in less than 2 days as in the case of RAG and TRX, which in the real world is not possible. The sales, assets, debtors and inventory of the non-failed companies increase and decrease in relation with each other and this is why the ratio increases and decreases are minimal.

4.10 TREND ANALYSIS – DEBT MANAGEMENT

The debt management ratio basically determines how a company has been financed and whether its debt has been well managed. A well-known slogan is "*the higher the risk the higher the return*", yet too much risk can bring a company to its knees. Vigaro (2008:219) simplifies the slogan by stating high risk equals to high returns plus high bankruptcy risk. Service (2013:1072) proposes that a company's safety structure is estimated by debt management ratios. Fulbier *et al.* (2008:128) state a company's financial and operating risk is considered by financial ratios indicating changes in the company's financial structure.

The Tables 4.29-4.36 below will depict how companies, failed and non-failed for the industry under review, have used and managed their debt financing within the period under review. This assessment is dealt with by assessing the ratios included within the debt management category of ratios.

The debt ratio indicates the proportion of the assets that have been financed using debt and how reliant a company is on borrowed funds to finance their activities. Grossman and Livingstone (2009:25) describe debt as being a blessing and a curse to a company, depending on their financial health condition. When a company's income is low, debt is a curse due to the repayment of an obligation burden. On the other hand, when a company has a high income, debt is a blessing. Regardless of how high the income is, the repayment remains the same, as it is normally a fixed payment. The debt to equity ratio will then follow and Vigario (2008:238) elucidates this ratio as enabling a company

to assess if they have or are capable of acquiring too much financial risk, as it identifies the financial risk the company is subjected to. CIMA (2009:23) has given a parameter for the debt to equity ratio, bearing in mind that it will differ as industries differs.

- Low: under 50%
- Average: 50 – 90%
- High: above 90%

The interest cover is then evaluated that determines the company's ability to repay their interest commitments. This ratio measures the number of times companies' earnings can decrease before the company will be unable to repay the interest (Brigham & Ehrhardt, 2007:447). Table 4.29 to 4.32 will reflect the debt management of the consumer goods industry.

4.10.1 Consumer Goods

Table 4.29: Debt Management ratios for Amlac Limited vs. Metair Investment Limited

Company Name	Failed					Non-Failed				
	ALC					MTA				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	63.67	70.25	87.51	102.36	78.68	36.19	31.03	27.41	28.12	32.12
Debt Equity (%) ²	175.26	236.19	700.85	-4342.91	369.10	56.73	44.99	37.75	39.11	47.31
Interest cover (x)	6.24	3.72	-0.13	-0.39	1.65	5.88	9.47	10.08	9.43	18.07

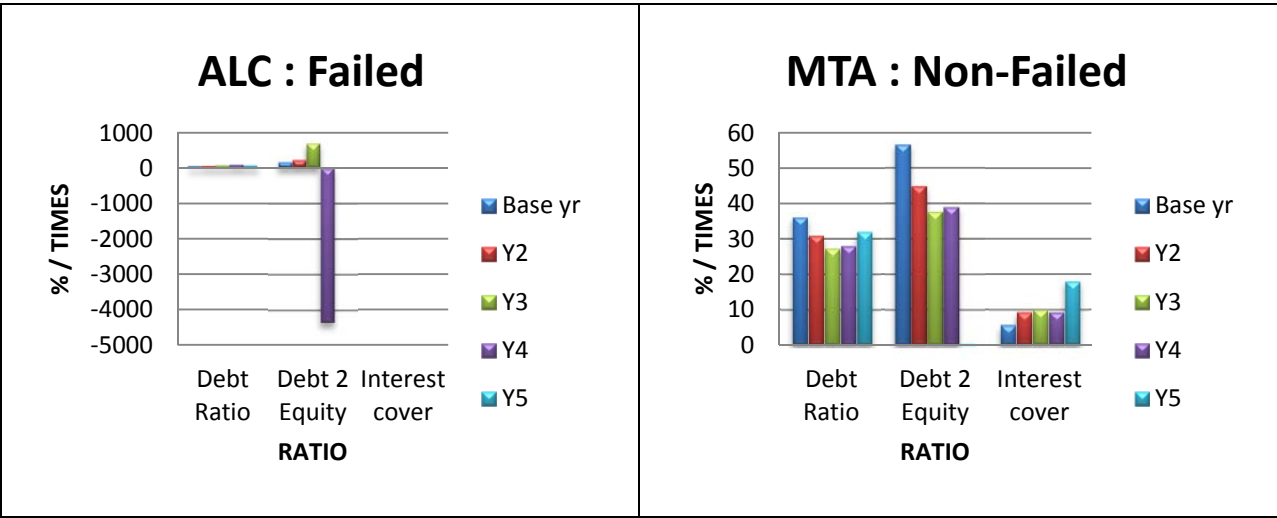
Source: McGregor BFA (2014) adjusted for own research

The debt ratio gives an indication of a company's debt financing structure. A low ratio is preferred, since a high ratio indicates heavy borrowing. ALC's debt ratio increased from the base year till year Y4 and declined in Y5. MTA's debt ratio remained at 30% range in the base year; Y2 and Y5, Y3 and Y4 ratio was within the 20% range.

Debt to equity ratio measures how dependent a company is on debt finance compared to equity finance. High ratio is not ideal, because it indicates higher risk. ALC’s debt to equity ratio is extraordinarily high and increased from the base years till Y3; in Y4 the ratio is negative and in Y5 it increased. MTA’s ratio decreased every year and there was a minor increase in Y4 and again in Y5. As per CIMA guide (CIMA, 2009:23), ALC’s ratio was at a high ratio range from the base year to Y3, and Y5 and in Y4 it was negative. MTA’s ratio fell within the average ratio range (50–90%) for the base year and throughout the remaining period it fell within the low ratio range (<50%).

As the interest cover measures whether a company can repay its interest, this ratio for ALC indicates that, in base year, interest can be covered 6 times, in Y2 3 times, Y3 and Y4 had a negative ratio and Y5 1 time. MTA’s ratio fluctuated, but the ratio remained quite high, base year 5 times, Y2 and Y4 9 times, Y3 10 times and Y5 significantly increased to 18 times. Information in Table 4.29 is presented in Figure 4.26 below.

Figure 4.26: Debt management ratios for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

Figure 4.26 reveals that the debt management ratios are negative for ALC in Y4. Table 4.30 that follows, will explain the debt management ratio trends of WES and CFR.

Table 4.30: Debt Management ratios for Wesco Investments Limited vs. Compagnie Financiere Richemont

Company Name	Failed					Non-Failed				
	WES					CFR				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	3.18	5.93	5.76	2.19	1.36	24.8	28.9	28.3	26.7	38.7
Debt Equity (%) ²	3.28	6.30	6.12	2.24	1.37	33.1	40.7	39.6	36.5	63.1
Interest cover (x)	0.00	0.00	0.00	0.00	0.00	27.65	44.04	36.79	42.97	37.76

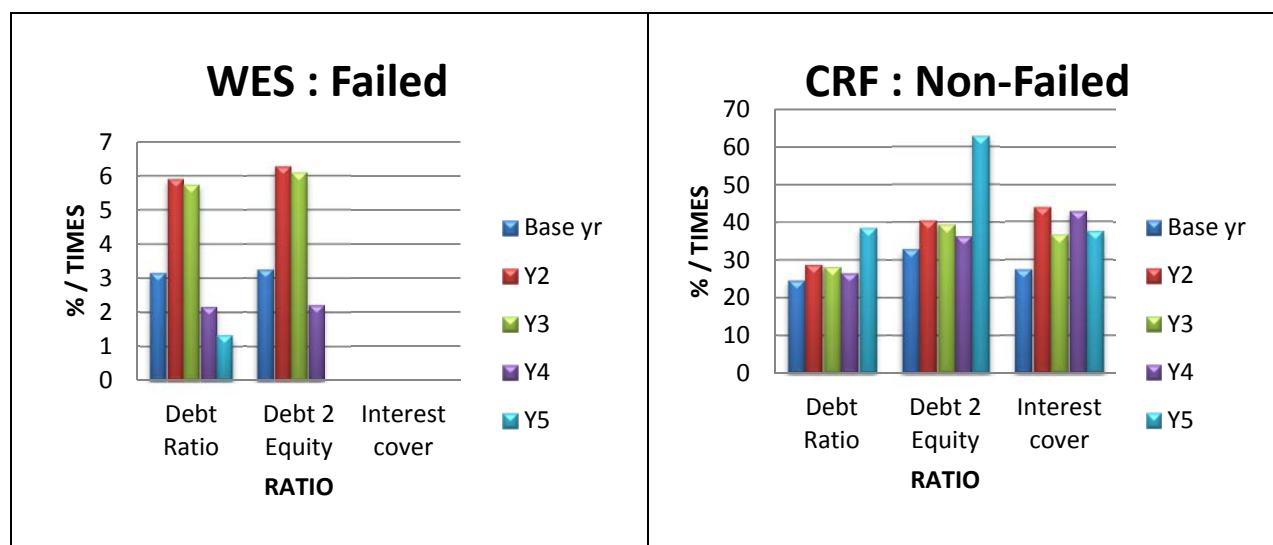
Source: McGregor BFA (2014) adjusted for own research

The debt ratio for WES increased from 3% in base year to 5% in Y2 and Y3; the ratio dropped to 2% in Y4 and there was a further decline to 1% in Y5. CFR's debt ratio fluctuated between 24% and 38% for the full period under study.

The debt to equity ratio for WES increased from the base year and decreased in Y4, with a further decline to 1% in Y5. Through the whole period, the ratio fell within the low ratio range at 6% at the maximum and 1% at the minimum. CFR's debt to equity ratio fell within the low ratio range for base year (33%), Y2 (40%), Y3 (39%), Y4 (36%) and Y5 fell with average ratio range (50–90%) at 63%.

Interest cover for WES was at zero for the entire period under study. According to the financial statements, WES has not paid any interest for the period under review. For CFR the ratio increased from the base year of 27 times to 44 times in Y2, 36 times in Y3, 42 times in Y4 and declined to 37 times in Y5. The information of Table 4.30 is illustrated in Figure4.27.

Figure 4.27: Debt management ratios for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.27 it is revealed that WES will not be able to repay their interest expense and Table 4.31 below indicates how PAL and SHF manage their debt.

Table 4.31: Debt Management ratios for Pals Holdings vs. Steinhoff International Holdings Limited

Company Name	Failed					Non-Failed				
	PAL					SHF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	46.2	25.4	22.1	37.1	58.3	50.9	54.9	67.8	78.3	75.3
Debt Equity (%) ²	86.1	34.0	28.4	59.1	140.3	103.9	121.8	211.0	361.0	305.0
Interest cover (x)	23.19	-1.33	6.51	-4.10	-4.20	6.74	6.13	5.40	4.36	3.09

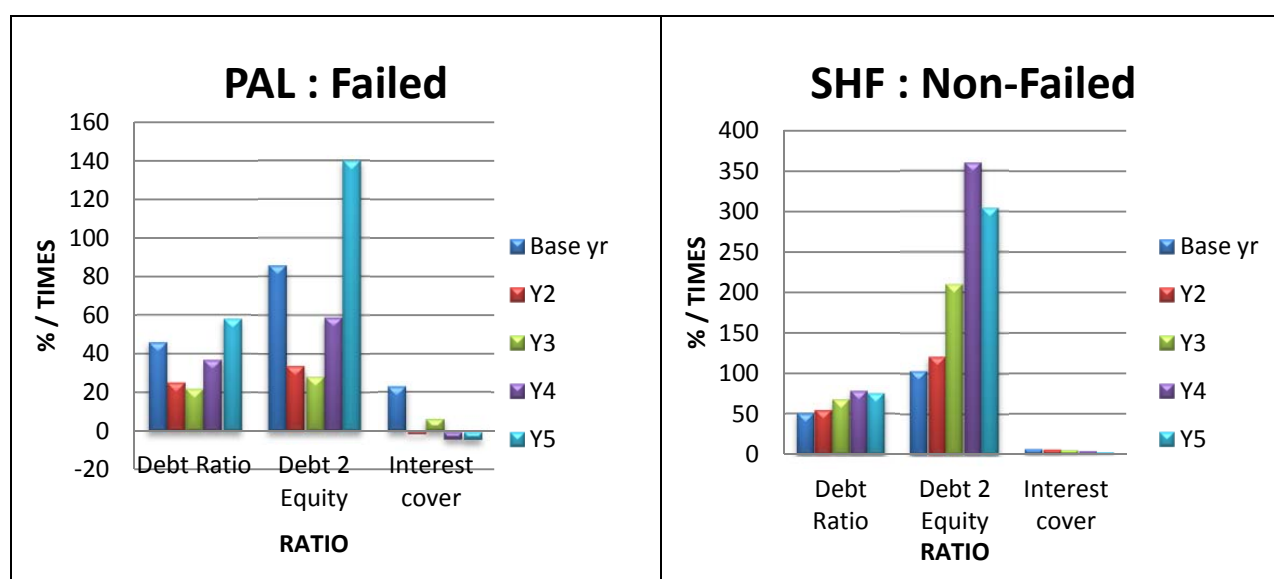
Source: McGregor BFA (2014) adjusted for own research

PAL's debt ratio decreased from the base year (46%) to (25%) in Y2 and (22%) in Y3 and increased in Y4 to 37% and further increased to 58% in Y5. SHF debt ratio increased till Y4 from base year and had a trivial decrease in Y5.

The debt to equity ratio for PAL fell within in low ratio array (<50%) in Y2 and Y3, average rate array (50–90%) in the base year and Y4, and high ratio array in Y5. SHFs' debt to equity ratio falls within the high ratio array (>90%) for the duration of the period under review.

PAL's interest cover was negative in Y2, Y4 and Y5 from 23 times in the base year and 6 times in Y3. SHF's ratio decreased consistently from the base year to Y5 and the ratio remained positive. A better explanation of the ratio will be illustrated in Figure 4.28 beneath.

Figure 4.28: Debt management ratios for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

A negative interest cover ratio is expressed for Y2, Y4 and Y5 for PAL. It is a sign that they are unable to repay their interest expenses for the years specified and the upcoming Table 4.32 describes the trend of TIW and SER.

Table 4.32: Debt Management ratios for Tiger Wheels Limited vs. Seardel Investments

Company Name	Failed					Non-Failed				
	TIW					SER				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	60.9	59.8	58.3	55.6	59.6	57.7	53.8	50.3	43.7	44.1
Debt Equity (%) ²	155.7	149.2	140.2	125.4	147.7	136.4	116.8	101.5	77.7	78.9
Interest cover (x)	2.73	4.80	8.17	6.47	3.39	1.89	2.79	2.05	1.82	2.34

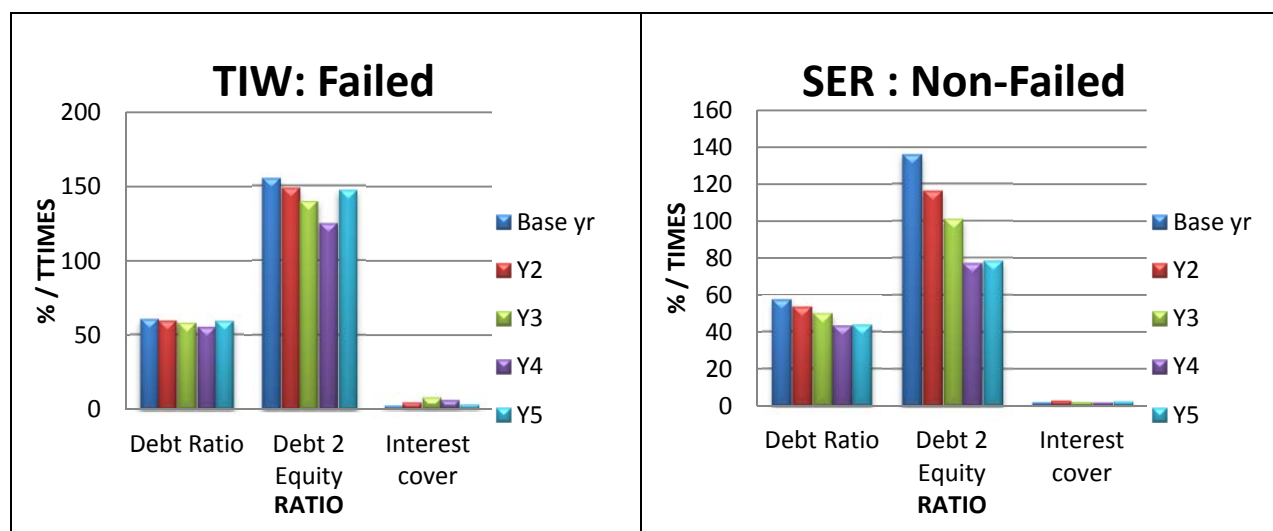
Source: McGregor BFA (2014) adjusted for own research

TIW's debt ratio fluctuated in the range of 50 to 60%, base year was at 60%, Y2 (59%), Y3 (58%), Y4 (55%) and Y5 (59%). The debt ratio of SER on the other hand, also varied and remained in the 40 to 50% range. In the base year the ratio was at 57%, Y2 at 53%, Y3 at 50%, in Y4 at 43% and Y5 at 44%.

The debt to equity ratio for TIW decreased from base years till Y4 and thereafter increased in Y5 as follows: 155%, 149%, 140%, 125% and 147%. SER's ratio decreased throughout the five year financial period from the base year till Y5, base year (136%), Y2 (116%), Y3 (101%), Y4(77%) and 78% in Y5.

The interest cover for TIW increased from base year at 2 times to 4 times in Y2 and 8 times in Y3 and decreased in Y4 to 6 times and a further drop to 3 times. SER's ratio increased from the base year at 1 time, Y2 and Y3 at 2 times, declined to 1 time in Y4 and increased in Y5 to 2 times. An explicit view of the changes in the debt management ratios are conveyed in Figure 4.29 below.

Figure 4.29: Debt management ratios for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

Figure 4.29 indicates that there is no reason for concern regarding the managing of the company's debt for both failed and non-failed companies, Tables 4.33 and 4.34 will discuss the debt management for the consumer services industry.

4.10.2 Consumer Services

Table 4.33: Debt Management ratios for Retail Apparel Group Limited vs. Shoprite Holding Limited

Company Name	Failed					Non-Failed				
	RAG					SHP				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	51.3	55.2	62.5	79.9	82.2	74.9	77.2	78.2	68.0	75.8
Debt Equity (%) ²	105.6	123.5	167.1	397.4	463.6	299.6	340.0	359.2	213.2	314.2
Interest cover (x)	3.92	3.34	1.38	0.67	-0.89	7.09	8.83	2.90	5.66	17.80

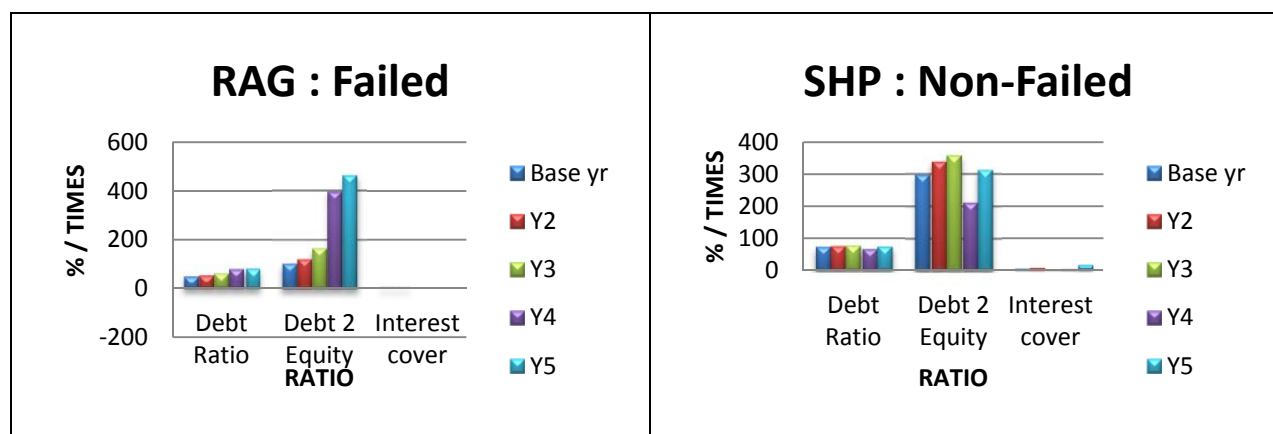
Source: McGregor BFA (2014) adjusted for own research

Debt ratio for RAG increased steadily every year from 51% in the base year, 55% Y2, 63% Y3, 79% Y4 and 82% in Y5. The ratios fluctuated for SHP and yet remained within the 60 to 70% range.

The debt to equity for both RAG and SHP is extremely high and fall within the high ratio range (>90%) as per the CIMA guide (CIMA, 2009:23). RAG increased every year for every R1 owner or shareholder employed into the company. The company owes creditors R1.06 in the base year, R1.24 in Y2, R1.67 in Y3, R3.97 in Y4 and R4.64 in Y5. SHP's ratio varied from base year to Y3. For every R1 owners employ, creditors were owed R3.00 in the base year, R3.40 Y2 and R3.59 Y3 and a decline to R2.13 in Y4 and R3.14 in Y5.

The interests cover ratio decreased annually from 3 times in base year and Y2, to 1 time in Y3, 0.67 times in Y4 to a negative ratio in Y5. SHP's interest cover ratio increased from base year to Y2 (7 times to 8 times). It decreased in Y3 (2 times) and 5 times in Y4, and increased considerably to 17 times in Y5. Shown in Figure 4.30 is the graphical appearance of the ratio in Table 4.33.

Figure 4.30: Debt management ratios for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

Figure 4.30 indicates RAG is unable to repay their interest expenses in Y5 and both RAG and SHP are highly dependent on internal finance, as indicated by the high debt to equity ratio. In Table 4.34 the managing of company debt is highlighted for TRX and WHL.

Table 4.34: Debt Management ratios for Terexko Limited vs. Woolworths Holding

Company Name	Failed					Non-Failed				
	TRX					WHL				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	42.3	24.4	15.9	40.8	46.8	40.4	34.9	31.5	32.2	39.9
Debt Equity (%) ²	73.4	32.3	18.9	69.0	88.0	67.8	53.7	46.1	47.5	66.4
Interest cover (x)	2.67	87.69	412.00	-13.90	7.15	8.34	5.45	9.28	12.85	14.27

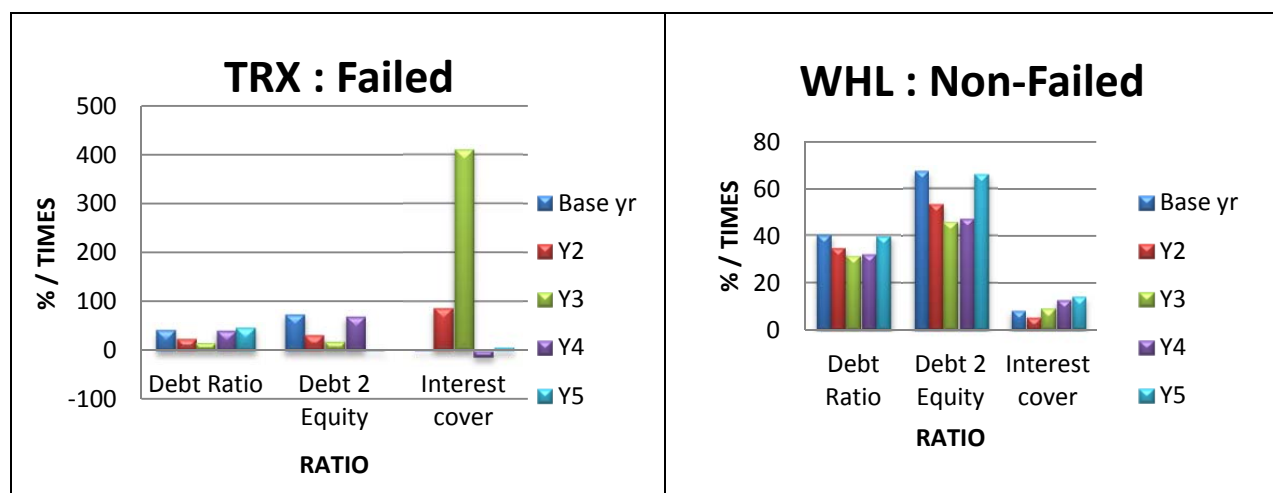
Source: McGregor BFA (2014) adjusted for own research

TRX's debt ratio decreased from the base year to Y2. A further decrease in Y3 ratio and increased in Y4 with a additional increase in Y5. WHL's ratio changed from 40%, 35%, 32% in Y3, 32% in Y4 and 40% in Y5.

The debt to equity ratio for TRX varied significantly, moving from 73% in the base year to 32% in Y2, 19% in Y3, 69% in Y4 and 88% in Y5. The ratio fell within the average ratio group (50-90%) in base year, Y4 and Y5 and within low ratio group (<50%) in Y2 and Y3. WHL's ratio moved from average ratios (50-90%) in base year to Y2 and to the low ratio level in Y3 and Y4, and again increased to the average ratio level in Y5 of 66%.

TRX's interest cover ratio changed significantly from 2 times in the base years to 87 times in Y2 and a sizable increase to 412 times in Y3, with an enormous drop to a negative ratio in Y4 and a 7 times rise in Y5. The EBIT in Y2 and Y3 was high with a low interest paid, resulting in a high ratio due to the numerator being higher than the denominator. In Y4 the negative ratio was brought about by negative EBIT and positive interest paid. WHL's interest cover from the base year was 8 times, Y2 5 times, Y3 9 times, Y4 12 times and Y5 14 times. The fluctuations of the ratios are shown in Figure 4.31 below.

Figure 4.31: Debt management ratios for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

Figure 4.31 gives a graphical indication of the irregular movement in the interest cover ratio of TRX shown in Y2 to Y4. Tables 4.35 and 4.36 appraise the debt management ratios of the industrial industry.

4.10.3 Industrial

Table 4.35: Debt Management ratios for Northern Engineering Industries Limited vs. Howden Africa Holding

Company Name	Failed					Non-Failed				
	NEI					HWN				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	40.9	44.8	46.9	33.8	38.6	62.7	45.9	47.0	47.3	44.9
Debt Equity (%) ²	69.3	81.4	88.6	51.2	62.8	168.6	85.0	88.7	90.5	81.5
Interest cover (x)	60.95	202.56	89.06	1139.88	15.55	7.47	5.55	3.88	1.93	1.45

Source: McGregor BFA (2014) adjusted for own research

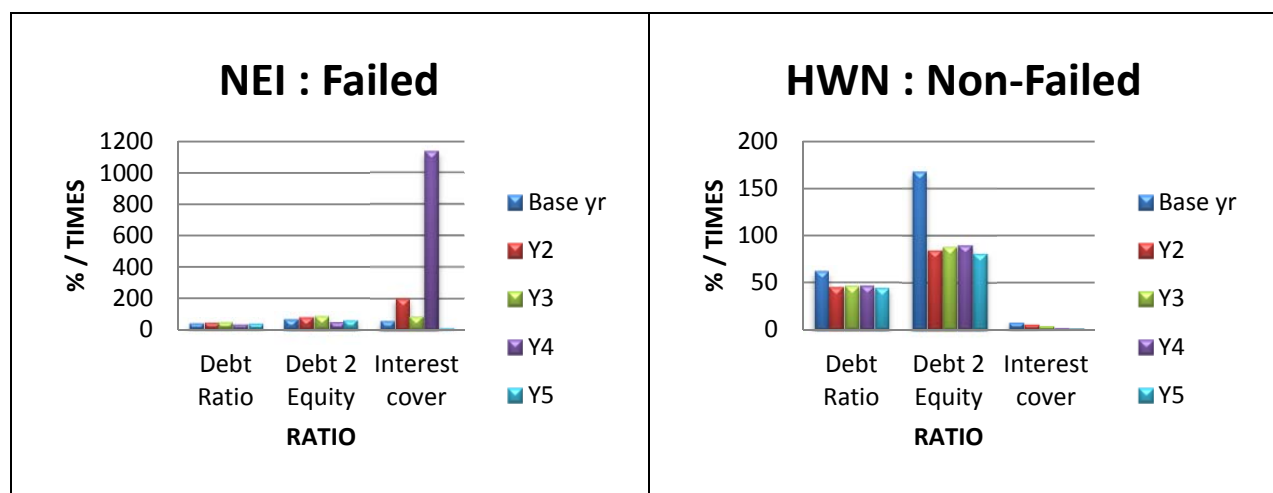
NEI's debt ratio transpired in the range 30–50%, 40% in the base year, 44% in Y2, 46% in Y3, 33% in Y4 and 38% in Y5. HWN's ratio decreased for the period from 62% to

45% faintly increasing to 47% for Y3 and in Y4, dropping to 44% in Y5. A low ratio is favourable as the lower the ratio, the better the margin of safety.

Debt to equity for NEI increased till Y3, from 69% in the base year, 81% in Y2 and 88% in Y3. In Y4 the ratio was at 51% and in Y5 at 62%, meaning for the full period the ratio fell within the average ratio range of 50 – 90%. HWN's ratio fell within the high ratio range (<90%) in base year and Y4, and the average ratio range (50–90%) in Y2, Y3 and Y5 in accordance with the CIMA guide (CIMA, 2009:23).

NEI's interest cover changed from 60 times in the base year, 202 times in Y2, 89 times in Y3, 1139 times in Y4 and 15 times in Y5 due to the high EBIT and very low interest paid which was the cause of the high ratio. HWN's ratio moved from 7 times in base year, 5 times in Y2, 3 times in Y3, 1 time Y4 and Y5. Figure 4.32 will give a graphical layout of the ratios above.

Figure 4.32: Debt management ratios for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.32, NEI shows that their interest cover ratios in Y2 and Y4 are very peculiar and DLG and WKF's assets management is showcased in Table 4.36 below.

Table 4.36: Debt Management ratios for Dialogue Group Holding Limited vs. Workforce Holding

Company Name	Failed					Non-Failed				
	DLG					WKF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Debt Ratio (%)	27.8	88.9	50.6	96.7	49.7	48.3	71.7	70.5	67.2	65.1
Debt Equity (%) ²	38.6	804.1	102.4	2991.9	98.9	93.4	253.4	239.5	205.7	186.8
Interest cover (x)	1286.41	23.21	-3.36	-19.36	15.38	3.97	3.93	1.64	2.06	2.56

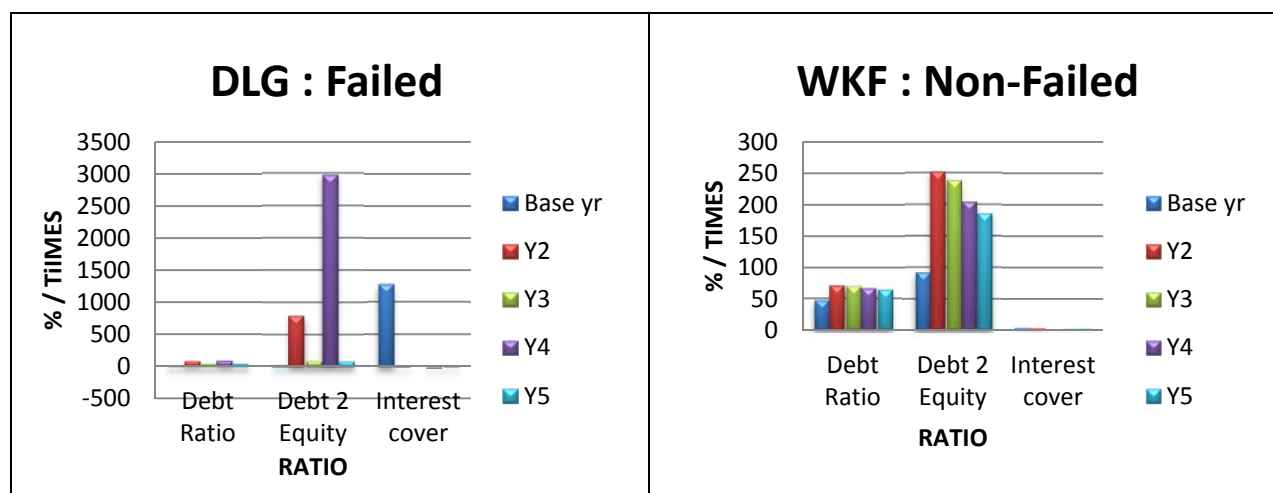
Source: McGregor BFA (2014) adjusted for own research

DLG's debt ratio fluctuated from 27% in the base year, 88% in Y2, 50% in Y3, 96% in Y4 and 49% in Y5. A lower ratio is better. WKF's ratio increased from base year to Y3 and slightly declined in Y4 and Y5. The ratio range was between 48-72%.

The debt to equity ratio of DLG varied significantly for the investigation period with inconsistent fluctuations in the base year (38%), Y2 (804%), Y3 (102%), Y4 (2991%) and in Y5 (98%), meaning for every R1 the shareholders invested in the company, the company owes creditors R0.38 in the base year, R8.04 in Y2, R1.02 in Y3, R29.92 in Y4 and R0.99 in Y5. WKF's ratio increased from base years to Y3 from 93%, 253% to 239% and slightly dropped in Y4 (205%) and Y5 (186%). DLG's ratio appeared within the low ratio array (<50%) and high ratio array from Y2 to Y5 and WKF within the high array for the five year period (>90%).

The interest cover for DLG regressed from a very high ratio at 1286 times to 23 times in Y2 because the EBIT was very high and interest paid very low. The ratio moved to being a negative in Y3 and Y4, due to the negative EBIT caused by the extraordinary losses DLG had for that period and the Y5 ratio increased to 15 times. WKF's ratio was at 3 times in the base year and Y2, declined to 1 time in Y3, then increased to 2 times in Y4 and Y5. The ratios are graphically manifested in Figure 4.33 that follows.

Figure 4.33: Debt management ratios for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

DLG's interest cover ratio in the base years is uncommon and negative in Y3 and Y4, indicating that in those years DLG was unable to make interest expense repayments. The ratios have indicated that in general the failed companies have managed their debt better than the non-failed companies for the periods under review. The financial statements have revealed the common reason for the failed company's ratios being better than the non-failed: the failed companies have low or no long term loans, which are the reason for the low interest paid. High sale levels and the increase of the inventory and debtors hugely exceeded that of the increase in the current liabilities annually. The question therefore arises how these companies finance their assets. The cash flow trends of the industries within the sample will be explained in the next section.

4.11 TREND ANALYSIS – CASH FLOW

Cash flow is the life blood of a company's existence. Without it a company cannot meet any obligations of a financial nature. Correia *et al.* (2011:5.19) mention cash flow to be perceived as a company's top indicator of financial stability.

The cash flow to debt ratio will be evaluated in Tables 4.37 to Table 4.44 below that will judge the trends of the cash flow in relation to the total debt for the failed and non-failed companies in the industries within the sample over the five financial years; the base years being the starting point of comparison. The lower ratio is an indication that less debt was used to finance activities.

4.11.1 Consumer Goods

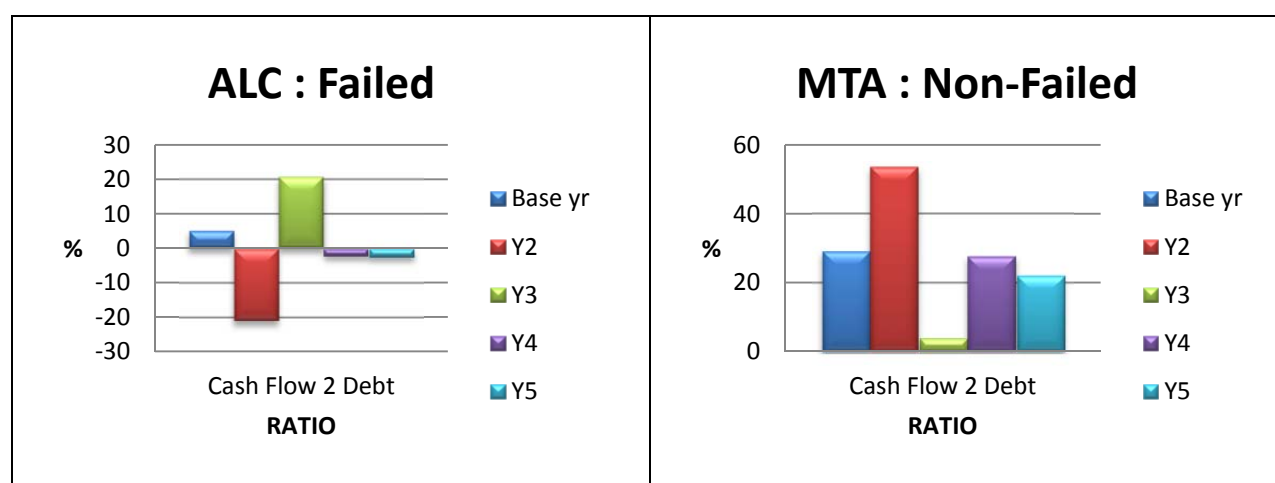
Table 4.37: Operating Cash Flow ratios for Amlac Limited vs. Metair Investment Limited

Company Name	Failed					Non-Failed				
	ALC					MTA				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	5.50	-20.99	20.82	-2.33	-2.67	29.19	53.63	4.06	27.74	22.15

Source: McGregor BFA (2014) adjusted for own research

The comparison for the period of five financial years under this study has shown ALC's base year and Y3 had a positive ratio, meaning ALC has the ability to produce cash flow in relation to their debt. Y2, Y4 and Y5 consisted of negative ratios due to negative cash flow from operations, making ALC unable to generate cash flow from their company activities relative to their debts. MTA's cash flow ratios indicate the cash flow it has generated from their company operations has increased from the base years to Y2. In Y3 there was a significant decline in the ratio which had a major increase in Y4 and Y5, as has been demonstrated in Table 4.37 above. A graphical trend analysis will be given in Figure 4.34.

Figure 4.34: Cash Flow ratio comparison for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.34 it can be clearly seen that ALC is experiencing financial difficulties. Table 4.38 that follows will assess the cash flow trend of WES and CFR.

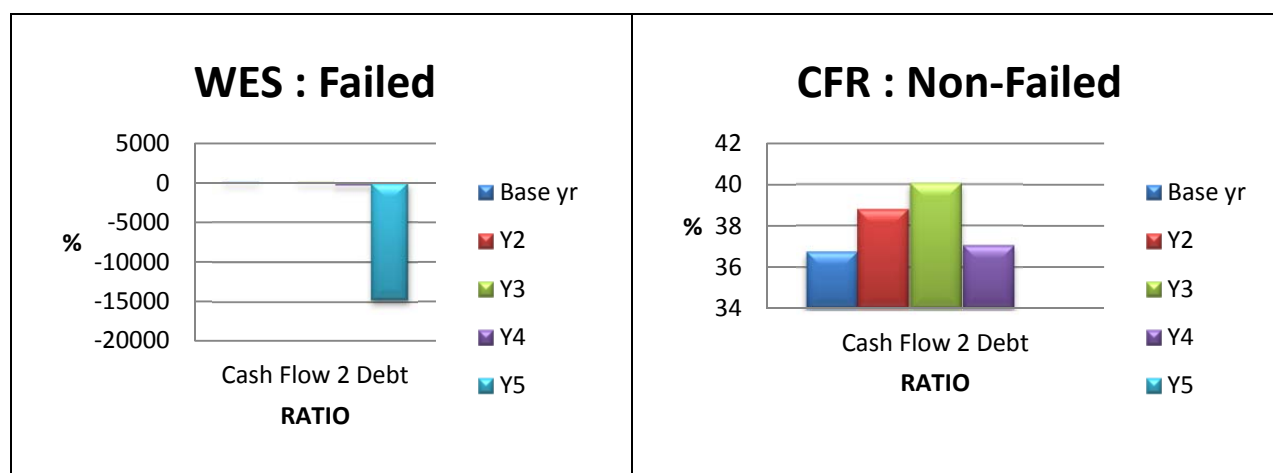
Table 4.38: Operating Cash Flow ratios for Wesco Investments Limited vs. Compagnie Financiere Richemont

Company Name	Failed					Non-Failed				
	WES					CFR				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	101.01	40.13	104.48	-295.25	-14744.41	36.79	38.84	40.10	37.10	44.34

Source: McGregor BFA (2014) adjusted for own research

As illustrated in Table 4.38, the cash flow generated for WES for the five year period clearly indicated WES was unable to meet their financial obligations and they were either bankrupt or on the brim of bankruptcy. WES's cash flow fluctuations were erratic: base year to Y5 was 101%, 40%, 104%, -295% and -14744%. WES debt decreased by 93% from Y4 to Y5, therefore the negative ratio increase from Y4 to Y5 because the cash flow increased negatively and the debt decrease caused the ratio to increase negatively. CFR's cash flow ratio indicates a consistent increase from base year to Y3, a decrease in Y4, and it increased again in Y5, indicating CFR is in a secure position to create cash flow in association with total debt. CFR's cash flow fluctuations from base year to Y2 increased by 5%. There was an additional 3% increase from Y2 to Y3; from Y3 to Y4 the ratio declined by 7% and there was an increase from Y4 to Y5 of 19%. Figure 4.35 shows the fluctuations of the ratios for both WES and CFR.

Figure 4.35: Cash Flow ratio comparison for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

The financial distress of WES is pointed out in the graphical representation in Figure 4.35 and the distress can be seen in Y4 and in Y5 the ratio is unnaturally high. The cash flow trend for PAL and SHF will be evident in Table 4.39.

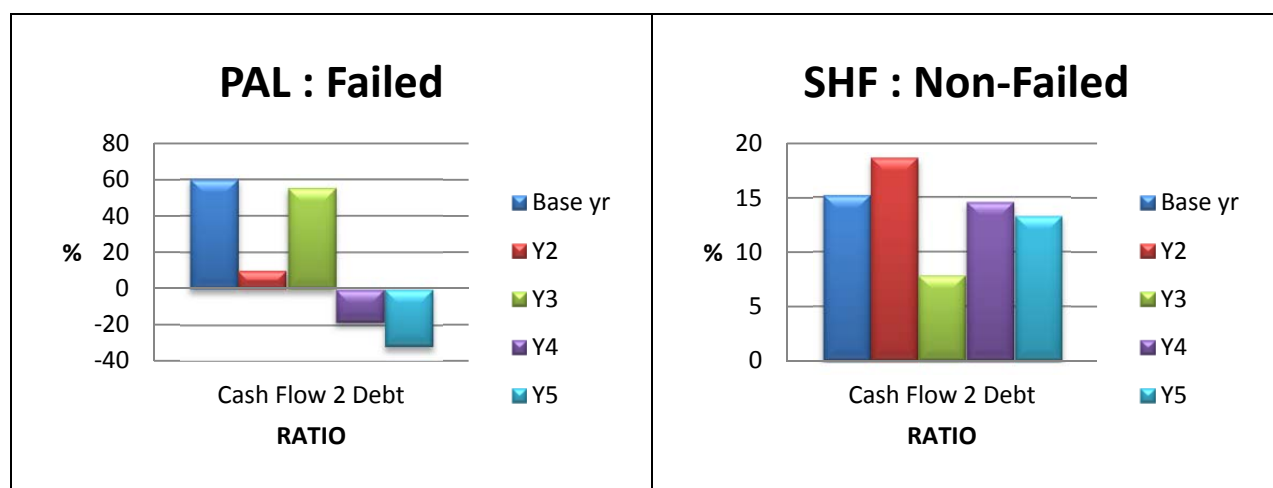
Table 4.39: Operating Cash Flow ratios for Pals Holdings vs. Steinhoff International Holdings Limited

Company Name	Failed					Non-Failed				
	PAL					SHF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	60.37	10.33	55.70	-18.53	-31.67	15.25	18.68	7.88	14.61	13.33

Source: McGregor BFA (2014) adjusted for own research

The fluctuation in the ratio for PAL is very vast as shown in Table 4.39. The change in the ratio alternated significantly from 60% in the base year, declining to 10% Y2, jumping to 55% in Y3 and slipping to a negative 18% in Y4 and a further decline to negative 31% due to the negative cash flow PAL had in Y4 and Y5. SHF's ratio remained positive throughout the period under review. An increase from base years to Y2 of 22%, a huge 58% drop in Y3 with an increase in Y4 of 85% and a minor 8% fall in Y5. The graphic layout of PAL and SHF is shown in Figure 4.36.

Figure 4.36: Cash Flow ratio comparison for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

Financial difficulty is experienced by PAL in Y4 and Y5, as depicted in Figure 4.36, and SHF has a healthy cash flow regardless of the fluctuations. The cash flow trend for TIW and SER is demonstrated in Table 4.40.

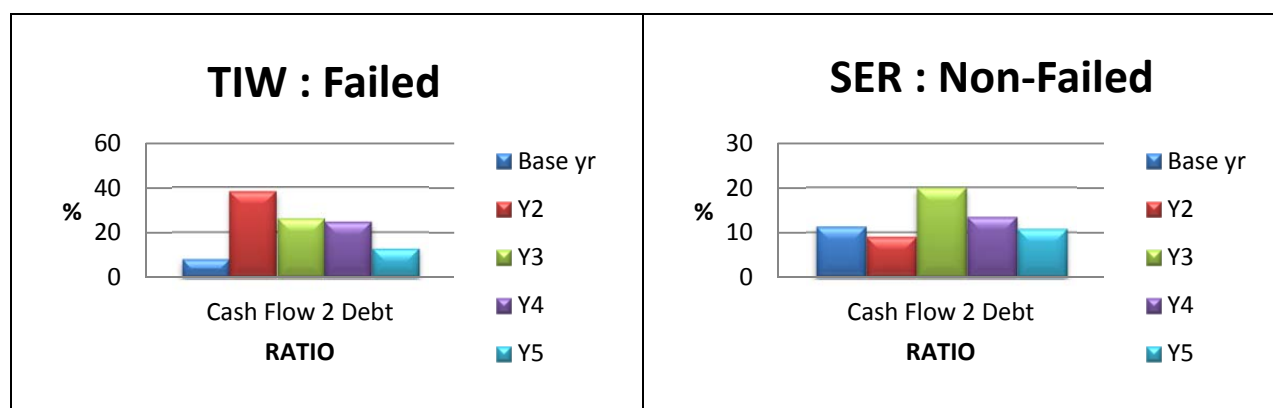
Table 4.40: Operating Cash Flow ratios for Tiger Wheels Limited vs. Seardel Investments

Company Name	Failed					Non-Failed				
	TIW					SER				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	8.48	38.50	26.45	25.06	13.07	11.49	9.21	20.07	13.64	10.97

Source: McGregor BFA (2014) adjusted for own research

The cash flow to debt ratio for TIW is positive and the fluctuations are not consistent yet positive. The movement in the ratio is from the base years until Y5 as 8% increased to 38%, and then decrease to 26%. There was a further decrease to 25% and subsequently a 13% decline in the ratio. SER's cash flow to debt ratio also swayed from 11% to 9%, then rose to 20%, declined again to 13% and had a further decline to 10%. Regardless of the declines in the ratio, the company was still able to generate cash flow in regard to their total debt. Figure 4.37 graphically represents the ratio in Table 4.40.

Figure 4.37: Cash Flow ratio comparison for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

A comprehensive indication that both the companies, failed and non-failed are still a going concern. The trend analysis for the companies that fall within consumer service industry will then be looked at in Table 4.41 and Table 4.42.

4.11.2 Consumer Services

Table 4.41: Operating Cash Flow ratios for Retail Apparel Group Limited vs. Shoprite Holding Limited

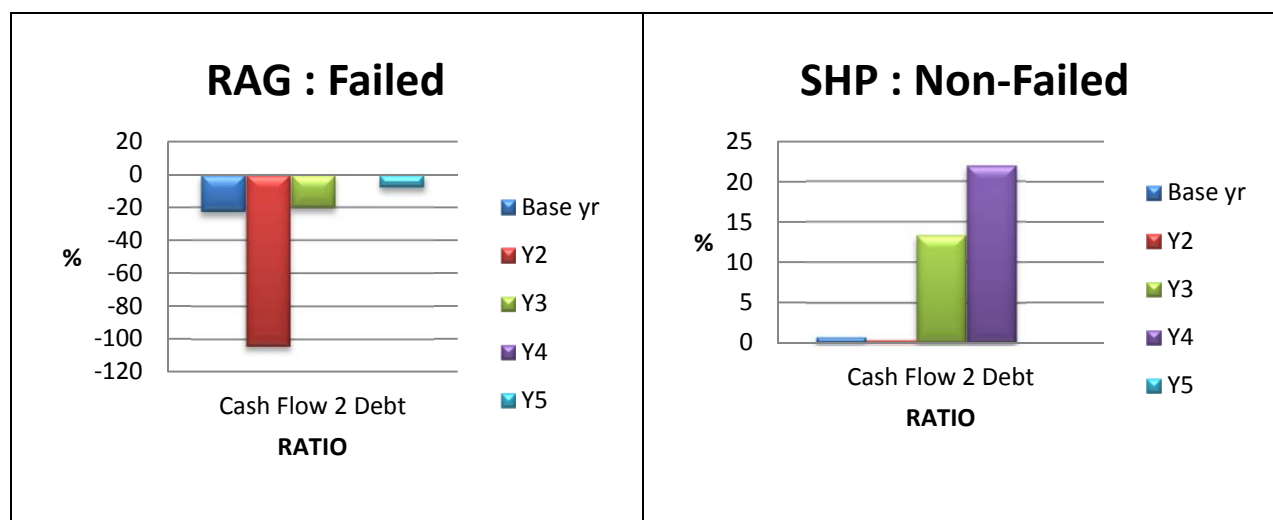
Company Name	Failed					Non-Failed				
	RAG					SHP				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	-22.59	-104.25	-20.19	0.01	-7.72	0.84	0.47	13.44	22.05	22.22

Source: McGregor BFA (2014) adjusted for own research

Table 4.41 shows that, for the period under study, RAG's cash flow to total debt ratio was negative in the base year, 22% to 104% in Y2, then 20% in Y3, positive 0.01% in Y4 and negative 7% in Y5, a negative cash flow indicates that the company will be unable to meet their financial obligations. The reason being that the cash flow was negative in the base year to Y3 and Y5, due to extraordinary losses the company suffered for the period. SHP's ratio was positive, yet low for the base year to Y3 and thereafter increased by 64% in Y4, while slightly increasing of 0.7% in the Y5. The ratio

started at 0.84% in base year, 0.47% in Y2, 13% in Y3 and the ratio was at 22% in Y4 and Y5. The validation for the low ratio for SHP was due to the nature of SHP's business. In Figure 4.38 an explicit view of the changes are conveyed.

Figure 4.38: Cash Flow ratio comparison for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

The conclusion from Figure 4.38 is that RAG is no longer a going concern, while SHP's ratio is doing well. In Table 4.42 the cash flow ratio of TRX and WHL will be discussed.

Table 4.42: Operating Cash Flow ratios for Terexko Limited vs. Woolworths Holding

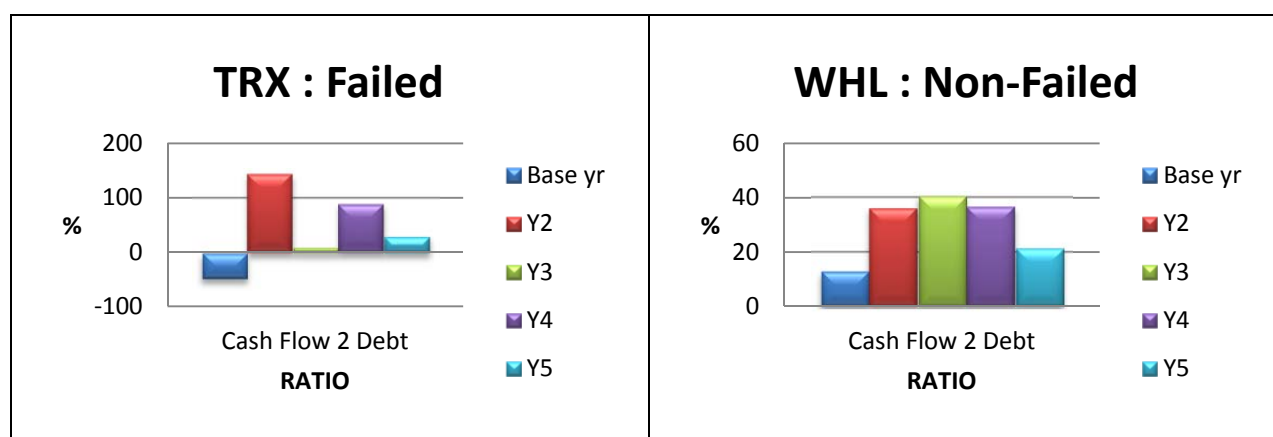
Company Name	Failed					Non-Failed				
	TRX					WHL				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	-47.98	144.99	10.19	89.82	29.87	13.06	36.20	40.57	36.79	21.49

Source: McGregor BFA (2014) adjusted for own research

TRX's cash flow to total debt ratio moved from being negative in the base years to a high positive ratio of 144% in Y2, a 93% decrease from Y2 to Y3, a growth to 89% in Y4 and once again the ratio dropped to 29%. The fluctuations of TRX were very inconsistent, had extraordinary profits from the base year, Y2 and Y3 and extraordinary

losses Y4 and Y5, with no tax for Y4 and Y5, and the cost also declined for that period. On the other hand WHL's cash flow to total debt ratio increased till Y3 and slightly declined in Y4 and again in Y5, but was still able to generate cash flow in relation to its total debt, as indicated in Table 4.42 above. Figure 4.39 beneath will give a better explanation of the ratio illustrated above.

Figure 4.39: Cash Flow ratio comparison for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

Figure 4.39 clearly indicates that the cash flow ratio for TRX has unusual variation and WHL's ratio indicates no reason for concern. Table 4.43 and 4.44 describe the cash flow trends for the industrial industry.

4.11.3 Industrial

Table 4.43: Operating Cash Flow ratios for Northern Engineering Industries Limited vs. Howden Africa Holding

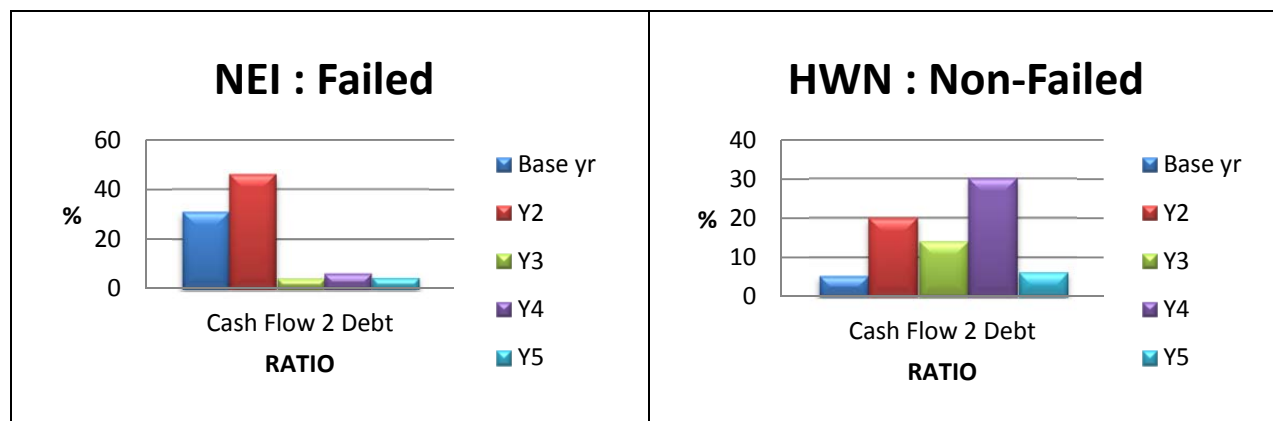
Company Name	Failed					Non-Failed				
	NEI					HWN				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	31.13	46.36	4.58	6.63	4.84	5.50	20.22	14.28	30.31	6.44

Source: McGregor BFA (2014) adjusted for own research

NEI's cash flow to total debt ratio declined except for Y2. It improved to 46% from 31% in the base year and it increased from 4% in Y3 to 6% in Y4, with a decline in Y5 to 4%.

HWN's cash flow to total debt ratio fluctuated, remaining positive and then changed from 5% to 20%, reducing to 14%, then increasing to 30% and then dropping to 6%. Shown in Figure 4.40 is the graphical appearance of the ratios in Table 4.43.

Figure 4.40: Cash Flow ratio comparison for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

Figure 4.40 indicates that the cash flow for NEI had declined from the base year. Attention needs to be given to the decline, as it can be a sign of financial problems. The cash flow trend of DLG and WKF will be looked at in Table 4.44.

Table 4.44: Operating Cash Flow ratios for Dialogue Group Holding Limited vs. Workforce Holding

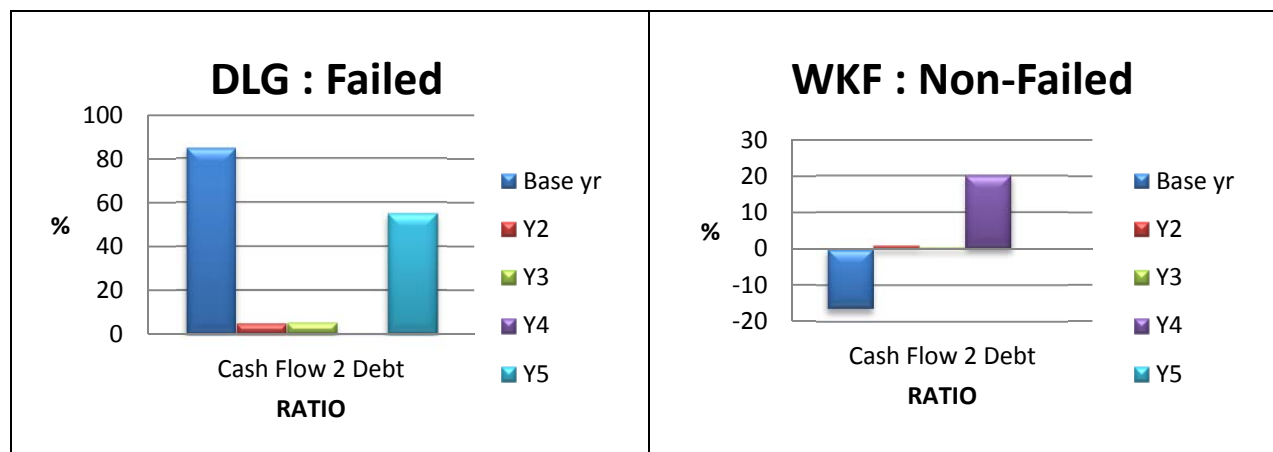
Company Name	Failed					Non-Failed				
	DLG					WKF				
Year	Base year	Y2	Y3	Y4	Y5	Base year	Y2	Y3	Y4	Y5
Cash flow 2 Total debt	85.12	5.20	5.62	0.47	55.32	-16.31	1.06	0.54	20.34	0.03

Source: McGregor BFA (2014) adjusted for own research

The cash flow to total debt ratio of DLG has moved from 85% to 5% in Y2, and in Y3 it declined to 0.47% in Y4, and increased to 55% in Y5. DLG has a 94% decrease, a slight increase of 8% from Y2 to Y3, a steep decline of 91% and then significantly increased to 55%. For the period Y4 to Y5, DLG cost declined and extraordinary profit was zero in Y4 and increased to 65269 in Y5, having caused the ratio to increase. WKF

started off with a negative cash flow to total debt ratio and increased slightly in Y2, with a minor decrease in Y3. In Y4 the ratio increased by 99% and then dropped to 0.03% in Y5. Information in Table 4.44 is demonstrated in Figure 4.41 below.

Figure 4.41: Cash Flow ratio comparison for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

Figure 4.41 reveals significant changes within the ratio from year to year for both DLG and WKF. The overall cash flow ratio of the non-failed companies outperformed the failed by 63%. This indicates the ability of the non-failed companies to meet their long term obligations far better than the failed companies. In the previous section the common reasons for the failed company's ratio looking better than the non-failed, was due to low or no long term loans. If a company has no cash it is unable to trade, therefore it will basically cease to exist or is heading towards that fate. Regardless of how well a company's other ratios look, cash flow will manifest the true financial condition of a company. For this reason, the financial statements have revealed that the non-failed companies' cash flow ratios generally look better than the failed companies' ratios.

Intra company comparison has been applied between failed and non-failed companies that fall within the consumer goods, consumer service and industrial industry by utilizing the trend ratio analysis. This will be followed by the intercompany comparison that will be done by use of comparative financial ratio analysis.

4.12 COMPARATIVE RATIO ANALYSIS

This analysis type occurs when ratios are compared among companies; one company is compared to another company. Sharma (2012:27) states a company's performance is compared to that of their peers or the standards within the industry. According to Tuvadaratragool (2013:120), this technique is affected by the following flaws: industry, time and size difference between the companies being compared. This study has tried to eliminate or minimize the effects of those factors by applying the matching or pairing technique.

In this study, the same 13 ratios will be applied as in the trend analysis. As previously mentioned, ratios were selected from Correia *et al.* (2011:5.37), were computed by The Bureau of Financial Analysis and have been summarized by ABSA for selected industries in South Africa and sought after ratios in relation to prior studies. The ratios selected are displayed in the five key ratio groups which are liquidity, consisting of current and quick ratios; profitability comprises of net operating profit margin, net profit margin, return on assets and return on equity. Assets management includes inventory turnover ratio, total assets turnover ratio and accounts receivable turnover ratio. Debt management covers debt ratio, debt to equity ratio, the interest cover ratio, and finally: operating cash flows consist of cash flow to total debt. Due to missing financial statement data, not all the ratio included in the list of selected ratio will be calculated.

Similar to trend analysis, the comparative analysis will be a comparison of companies within the same industry to the industry standards according to the standards provided in Correia *et al.* (2011:5.37), computed by the Bureau of Financial Analysis exhibited in Table 4.45 below.

Table 4.45: South African industry norms or benchmarks

Financial Ratios	Consumer Goods	Consumer Services	Industrial
Total Asset Turnover (x)	1.61	1.95	1.34
Current Ratio (x)	0.58	1.63	0.93
Quick Ratio (x)	0.36	1.15	0.71
Accounts Receivable Turnover (x)	12.28	5.25	6.21
Debt to Asset (Debt Ratio) (%)	1.07	0.59	0.35
Debt to Equity (%)	0.80	1.25	0.50
Interest Cover (x)	5.30	12.53	9.00
Operating Profit Margin (%)	0.19	0.11	0.14
Net Profit Margin (%)	0.11	0.07	0.10
Inventory Turnover (x)	4.56	9.28	6.78
Return on Assets (%)	0.31	0.21	0.11
Return on Equity (%)	0.12	0.28	0.11
Cash Flow to Total Debt (%)	15.26	7.49	13.64

Source: Correia *et al.* (2011:5.37) adjusted

The primary industry includes a number of other secondary sectors. In this study the highest of the secondary sector norms will be used as the benchmark, as shown in Table 4.45. ABSA sectorial ratio of South Africa compiled the industry norms specifically for the South African industries. The important ratios depending on the nature of the industry were identified, including the companies known as the industry forerunners. This summary excludes the banking sector. In trend analysis, the trend of the ratio was monitored, using the base year as a starting point in comparing the failed with the non-failed companies that are within JSE industry included in our sample. This analysis was done in order to determine whether the individual companies' performance has improved or worsened. With the comparative ratio analysis the failed and non-failed companies will be compared to industry norms within this study to be able to establish the company's strengths or weaknesses in comparison to those of their peers.

4.12.1 Consumer goods

The consumer goods industry is a primary industry and it covers the following sector types: beverages, clothing and household appliances. In Table 4.46 below, the averages or means of the failed and non-failed companies within the consumer goods industry will be compared with one another and measured against the industry norms. This comparison will be done per ratio categories, starting with liquidity, then profitability, followed by asset management and debt management, and finally operating cash flows.

Table 4.46: Comparative ratio analysis of the consumer goods industry

		F	NF	F	NF	F	NF	F	NF
LIQUIDITY	Sector Norms	ALC	MTA	WES	CFR	PAL	SHF	TIW	SER
Current Ratio (x)	0.58	1.73	2.47	18.79	2.17	2.70	1.74	1.25	1.91
Quick Ratio (x)	0.36	1.02	1.30	18.79	1.27	1.59	1.41	0.75	1.06
PROFITABILITY									
Net Profit Margin %	0.11	3.75	6.23	0.00	20.38	-0.15	6.96	4.44	3.69
Operating Profit Margin %	0.19	6.08	8.83	0.00	23.99	1.76	11.53	6.64	5.13
Return On Assets %	0.31	7.03	10.48	-42.56	11.61	-0.38	11.09	8.44	7.20
Return On Equity %	0.12	138.84	13.02	-43.17	16.46	-4.78	25.80	15.60	7.77
ASSET MANAGEMENT									
Inventory Turnover (x)	4.56	6.62	5.56	0.00	2.38	6.18	9.18	6.76	5.16
Total Assets Turnover (x)	1.61	1.54	1.68	0.00	0.55	2.06	1.12	1.44	1.47
Accounts Receivable Turnover (x)	12.28	72.53	52.73	0.00	44.82	70.52	89.06	63.74	72.10
DEBT MANAGEMENT									
Debt / Assets (%)	1.07	0.80	0.31	0.04	0.30	0.38	0.65	0.59	0.50
Debt / Equity (%)	0.8	-5.72	0.45	0.04	0.43	0.70	2.21	1.44	1.02
Interest Cover (x)	5.3	2.22	10.59	0.00	37.84	4.01	5.14	5.11	2.18

		F	NF	F	NF	F	NF	F	NF
OPERATING CASH FLOW									
Cash Flow To Total Debt (%)	15.26	0.07	27.35	-2958.0	39.43	15.24	13.95	22.31	13.08

Source: McGregor BFA (2014) adjusted for own research

In Table 4.46 it illustrates *Current Ratio*: When the ratio is 2 it reveals that a company's current assets are twice the size of their current liabilities and they are able to pay off their current liabilities. WES ratio is at 18. A higher ratio is good, but if it is too high it discloses that the WES current assets are not re-invested and there is unnecessary money tied up in assets.

Quick Ratio: The higher the ratio the higher the liquid assets. The norm for this ratio is 0.36 and all the companies are above the norm. WES ratio is identical to the current ratio, meaning they have no inventory.

Net Profit Margin Ratio: A higher ratio is preferred as it manifests that the company's sales are nicely managed compared to their expenses. The norm is at 0.11. All the companies' ratios are higher than the norm excepting WES at zero and PAL that is negative.

Operating Profit Margin Ratio: Only WES is below the norm of 0.19 at zero. All the other companies' ratios are above the norm. This ratio indicates the sales that are left after all costs are paid; the norm indicates R0.19 is left in sale after all costs have been paid.

Return on Asset Ratio: Ratio signals the income produced by the assets: the higher, the better, as it is an indication of an upward trend and that more income is being produced by the assets. WES and PAL are negative. It could be that they do not have any assets to produce income and all the other companies' ratios are greater than the norm of 0.31.

Return on Equity Ratio: When this ratio is 1, it means for every R1 of equity invested, it creates R1 in net profit. The norm of 0.12 implies R0.12 of net income is provided by every R1 of equity invested. ALC's ratio is very high, WES and PAL are negative and the rest of the companies are higher than the norm.

Inventory Turnover Ratio: This ratio signals the company's inventory controlling efficiency. The ratios are above the norm except for WES and CFR. WES shows no

inventory is being replaced or sold, CFR's ratio signifies they replace their inventory twice a year and the other companies replace or sell their inventory at least 5 times (minimum) and 9 times (maximum). A higher ratio is better, as the level of obsolete stock is reduced or eliminated.

Total Assets Turnover Ratio: A low ratio signals assets are not being employed effectively: ALC, WES, TIW, CFR, SHF and SER are below the norm.

Accounts Receivable Turnover Ratio: This ratio determines the number of times accounts receivable can be converted into cash, the norm is at 12 times all the ratio exceeding the norm, excluding WES.

Debt Ratio: A low ratio is favored as the lower the ratio the more stable a company is, having more assets compared to debt. All the ratio of the companies is below the norm of 1.07.

Debt to Equity Ratio: This ratios norm is at 0.8, ALC's ratio is negative, WES (0.04), PAL (0.70), MTA (0.45), CFR (0.43) and only TIW, SHF and SER's ratio are above the norm. A high ratio displays that a company is funded by more outside debt than equity.

Interest Cover Ratio: The norm is 5 times, so the earnings need to be 5 times the interest expense. The higher the ratio, the higher the earnings compared to the interest expense. Only MTA and CFR's ratios are above the norm.

Operating Cash Flow Ratio: This ratio shows that all the companies can pay their debt with their cash flow, except ALC, WES, SHF and SER. ALC will need more than the cash flow to pay their debt and WES is no longer a going concern.

4.12.2 Consumer services

The consumer service industry consists of the different business types that fall within this sector, namely airlines, hotels, restaurants and media agencies. The Table 4.47 below will illustrate the ratios that fall within the five major financial ratios groupings. The ratios will be compared: the failed with the non-failed companies, and then measured against the industry norms.

Table 4.47: Comparative ratio analysis of consumer service industry

		F	NF	F	NF
LIQUIDITY	Sector Norms	RAG	SHP	TRX	WHL
Current Ratio (x)	1.63	2.05	0.99	1.85	1.76
Quick Ratio (x)	1.15	1.65	0.44	1.78	1.34
PROFITABILITY					
Net Profit Margin %	0.07	-5.16	1.57	-12.82	5.08
Operating Profit Margin %	0.11	7.70	2.46	6.89	8.56
Return On Assets %	0.21	5.87	7.24	2.22	11.58
Return On Equity %	0.28	-16.09	23.97	2.46	15.42
ASSET MANAGEMENT					
Inventory turnover (x)	9.28	6.72	8.63	56.60	13.22
Total Assets Turnover (x)	1.95	1.09	3.39	0.57	1.92
Accounts Receivable turnover (x)	5.25	213.49	23.27	96.14	73.36
DEBT MANAGEMENT					
Debt / Assets (%)	0.59	0.66	0.75	0.34	0.36
Debt / Equity (%)	1.25	2.51	3.05	0.56	0.56
Interest Cover (x)	12.53	1.68	8.45	99.12	10.04
OPERATING CASH FLOW					
Cash Flow To Total Debt (%)	7.49	-30.95	45.52	11.81	29.62

Source: McGregor BFA (2014) adjusted for own research

Table 4.47 exhibits that *Current Ratio*: SHP is the only company below the norm of 1.63; it is the least liquid. Above 2 indicates that RAG has twice more current assets than current liabilities.

Quick Ratio: All companies are above the 1.15 norm except SHP. Ratio above points out the company can pay current liabilities with their liquid assets and still have liquid assets left.

Net Profit Margin Ratio: RAG and TRX are negative, meaning they are making a loss, sales cannot be converted into profit. SHP and WHL are above the norm of 0.07 and reflect that the company expenses are managed well, compared to their sales.

Operating Profit Margin Ratio: All ratios are above the norm of 0.11, meaning for RAG R7.70, TRX R6.89, SHP R2.46 and WHL R8.56 is returned as profit after expenses are paid.

Return on Asset Ratio: The assets are being used effectively if the ratio is above the norm, which is 0.21. WHL generates the highest return, meaning for every R1 invested in assets, R11.58 is produced in net income.

Return on Equity Ratio: Indicates the shareholder's investment in TRX, SHP and WHL were best used and managed, and higher than the norm of 0.28. RAG, on the other hand, is not managed very well or at all, as the ratio is negative.

Inventory Turnover Ratio: The industry norm is indicated at 9.28. A high ratio is evidence that the company is replacing their inventory often and the company is performing well. TRX is the highest, followed by WHL, SHP and RAG is below the industry norm.

Total Assets Turnover Ratio: Only SHP's assets are above the norm of 1.95. The total asset turnover ratio of the other companies can suggest that the assets are either not being used effectively or need to be disposed of.

Accounts Receivable Turnover Ratio: All the ratios are above the norm which is at 5 times for all the companies. This means it is a good thing, as it shows that the company's receivables are collected quickly. RAG's ratio is 40 times above the norm and way more than the non-failed company's ratio of SHP and WHL.

Debt Ratio: TRX and WHL are below the norm, standing at 0.59, the lower the ratio, the better, as it is a sign of how stable a company is. RAG and SHP only have 1/3 more assets than liabilities (latter) and the former has 1/5 more assets than liabilities.

Debt to Equity Ratio: Indicates the proportion of the external financing (debt) compared to internal financing (equity). The lower the ratio, the better; meaning more equity funding is used than debt. TRX and WHL both are below the norm which is 1.25, meaning that they are not so dependent on leverage and they have a solid equity situation.

Interest Cover Ratio : The norm is at 12 times and all the companies except TRX are below the norm, meaning their earning for RAG is 1 time more than interest expense, SHP 8 times and WHL 10 times. A low ratio is a warning sign because if the company cannot repay the interest, how are they going to repay the principle debt?

Operating Cash Flow Ratio: An industry norm of 7.49 is indicated; RAG's ratio is negative, meaning the company is no longer a going concern and their cost is too much. A high ratio is favourable and TRX, SHP and WHL's ratios point out that they have the ability to pay their debt using cash flow.

4.12.3 Industrial

The industrial industry comprises of building and construction, electronic equipment, shipping and ports which are the different subsidiary sector types under this industry. The table 4.48 below will demonstrate the ratios of the five major financial ratio categories by comparing the failed with the non-failed companies and then measured against the industry norms indicated.

Table 4.48: Comparative ratio analysis of industrial industry

		Failed	Non-failed	Failed	Non-failed
LIQUIDITY	Sector Norms	NEI	HWN	DLG	WKF
Current Ratio (x)	0.93	1.79	1.71	1.24	4.01
Quick Ratio (x)	0.71	1.07	1.20	1.24	4.00
PROFITABILITY					
Net Profit Margin %	0.5	3.92	1.37	1.27	2.02
Operating Profit Margin %	0.11	5.26	9.32	3.62	4.10

		Failed	Non-failed	Failed	Non-failed
Return On Assets %	0.11	8.17	13.44	0.07	11.07
Return On Equity %	0.11	13.60	16.67	-262.48	18.09
ASSET MANAGEMENT					
Inventory turnover (x)	6.78	6.44	6.27	115.10	800.92
Total Assets Turnover (x)	1.34	1.87	1.68	1.78	3.17
Accounts Receivable turnover (x)	6.21	58.86	89.74	45.96	85.88
DEBT MANAGEMENT					
Debt / Assets (%)	0.35	0.41	0.50	0.63	0.65
Debt / Equity (%)	0.5	0.71	1.03	8.07	1.96
Interest Cover (x)	9.00	301.60	4.06	260.46	2.83
OPERATING CASH FLOW					
Cash Flow To Total Debt (%)	13.64	18.70	12.77	30.35	1.13

Source: McGregor BFA (2014) adjusted for own research

Table 4.48 has determined *Current Ratio*: Over 1 means the current assets are sufficient to settle the current liabilities. WKF's high ratio and NEI, HWN and DLG above the 0.93 norm mean they have the ability to service their short term obligations.

Quick Ratio: It is a good indication if the ratios are above the norm currently at 0.71 which all the companies' ratios exceed. It shows the company will not experience liquidity problems and they will be able to handle unforeseen declines.

Net Profit Margin Ratio: The ratios of all the companies within the different industries are exceeding the 0.5 norm. A higher ratio signifies a higher profitability and a better safety margin.

Operating Profit Margin Ratio: Company expenses are managed well compared to their sales when the ratio is high, meaning more sales can be converted into profit. So high

ratios are preferred and is also preferred that ratios should be above the norm at 0.11 which all the ratio of the above companies are.

Return on Asset Ratio: DLG is beyond the norm of 0.11. It means they produce R0.07 net income for every R1 invested in assets. The higher the ratio, the better, as it implies higher net income is produced from every R1 invested in assets and the assets are well managed.

Return on Equity Ratio: A higher ratio is desired as it points out the shareholders' investments are being utilized appropriately, which in turn will create better returns for the shareholders. DLG's ratio is negative and all the other companies' ratios are above the norm of 0.11.

Inventory Turnover Ratio: NEI and HWN's ratios are slightly below the norm of 6.78. A higher ratio is favorable, DLG and WKF's ratios are totally out of line. NEI and HWN's ratios reflect that their inventory is replaced 6 times per annum.

Total Assets Turnover Ratio: All the companies' ratios are above the norm which is at 1.34. For every R1 of assets used, R1.87 sales were generated for NEI, R1.68 for HWN, R1.78 for DLG and R3.17 for WKF.

Accounts Receivable Turnover Ratio: The norm for this ratio is 6 times and all the companies' ratios are way above the norm. Higher ratio signals a shorter accounts receivable collection period and the number of times cash will flow into the company from their credit sales.

Debt Ratio: The portion of debt a company has, compared to assets; meaning debt is a percentage of the assets. A lower ratio is better, as it shows a company is more stable. As all the companies' ratio are above the norm at 0.35, it means the companies have higher debt in relation to their assets.

Debt to Equity Ratio: All the ratios are above the norm of 0.5, but DLG is way above the norm. This indicates that the creditors are not well protected if the company has to become insolvent because there are more external funds used than equity.

Interest Cover Ratio: NEI and DLG have huge differences in ratio compared to the norm that is at 9 times. NEI is 33 times above the norm and DLG is 28 times above the norm,

indicating that NEI's earnings are 301 times more than their interest expenses and DLG's earnings were 260 times more than their interest expense.

Operating Cash Flow Ratio: The norm for this ratio is 13.64, HWN and WKF's ratios are below norm yet positive. This is a good sign, meaning if the ratio is above 1, their debt can be paid using their cash flow and a high ratio points out good liquidity.

4.13 EMERGING MARKET SCORE MODEL (EMS)

Correia *et al.* (2011:5.24) refer to the EMS model's level of accuracy as superior to Altman's previous models. This model excludes Sale/Total assets and the Book Value of equity substitutes market value of equity. Altman and Hotchkiss (2006:280) affirm this model has been successfully applied to emerging markets, including Mexico, Brazil, Argentina and many Asian countries of which the outcomes were impressive in predicting bankruptcy.

This study will apply the EMS model to 16 companies in total of which eight companies have failed and eight non-failed over three different JSE industries, namely eight companies in total in consumer goods industry consisting of ALC, WES, PAL and TIW which failed. Non-failed are MTA, CFR, SHF, and SER. The consumer services industry includes four companies in total failed, namely RAG, TRX, the non-failed are SHP and WHL. The industrial industry is made up of four companies: in total the failed companies are composed of NEI, DLG and the non-failed are HWN and WKF. EMS model will be implemented to compare individual failed and non-failed companies with each other within the same industry over a five year period and this process will be continued for all three industries.

Correia *et al.* (2011:5.24) point out companies with an EMS score that is more than 2.60 are classified to be in the safe zone, but if the score is less than 1.10, it is referred to as the distress or failed zone. Companies that fall within 1.10 (meaning more than 1.10) and less than 2.60 are graded as the grey or danger zone in which uncertainty occurs. EMS formula: as per equation 3.18 indicated in Chapter 3.

$$\text{EMS} = 3.25 + 6.56x_1 + 3.26x_2 + 6.72x_3 + 1.05x_4 \quad (3.18)$$

Where:

X1 = Working capital / Total assets

$X2 = \text{Retained earnings} / \text{Total assets}$

$X3 = \text{Earnings before interest and tax} / \text{Total assets}$

$X4 = \text{Book value of equity} / \text{Total liabilities}$

The EMS model analysis will be presented by conducting a comparison of individual matched companies per industry. The tables below exhibit how the model has been applied to the individual companies, failed vs. non-failed. The following steps will be taken in computing the EMS. Firstly, variable x1 will be computed, and then variable x2, next variable x3 and finally x4. Then the variable computation outcomes will be added to 3.25 in order to determine the EMS. The computation of the EMS model in Tables 4.49 to 4.56 per industry follows. Table 4.49 will exemplify the EMS of ALC and MTA for five consecutive years.

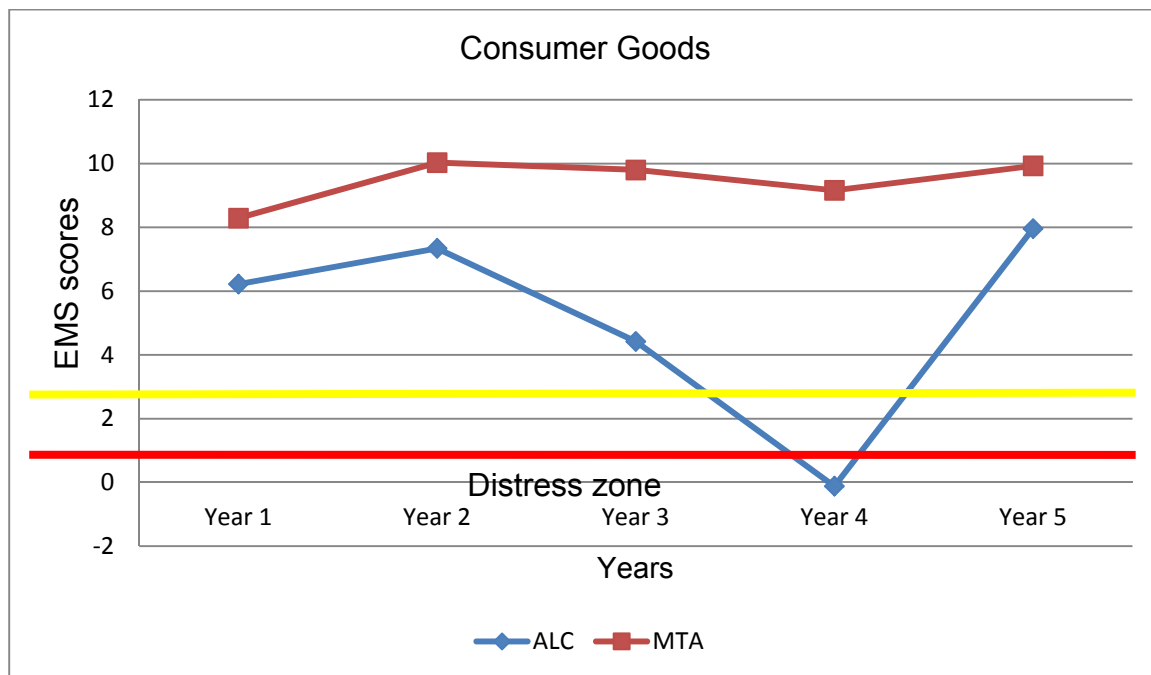
Table 4.49: EMS computation for ALC and MTA

			Failed					Non-Failed				
			ALC					MTA				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	1.71	-2.59	1.43	2.16	0.13	2.74	2.44	2.65	2.63	1.83
X2	<u>Retained Earnings</u> Total Assets	+3.26	0.75	-0.48	-0.32	0.32	0.47	0.35	0.10	0.19	0.40	0.23
X3	<u>EBIT</u> Total Assets	+6.72	1.96	-0.28	-0.09	1.16	1.77	1.38	0.68	0.93	1.42	1.12
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	0.28	-0.02	0.15	0.44	0.60	2.22	2.68	2.78	2.33	1.85
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	7.96	-0.12	4.42	7.34	6.22	9.93	9.16	9.80	10.03	8.29

Source: McGregor BFA (2014) adjusted for own research

Table 4.49 exhibits the EMS indicating that in Y1 to Y3 and Y5 the score fell within the safe zone and in Y4 it was within the distress zone for ALC. MTA's EMS fell within the safe zone for the entire period under review. Figure 4.42 will give a graphical interpretation of the amounts above.

Figure 4.42: EMS for ALC and MTA



Source: McGregor BFA (2014) adjusted for own research

Figure 4.42 illustrates ALC's EMS are above the 2.60 mark for Y1 to Y3 and Y5, and for Y4 the score was below 1.10 mark. MTA's EMS for the entire period under review were above the 2.60 marking. In Table 4.50, the EMS for WES and CFR will be set out for five uninterrupted years under investigation.

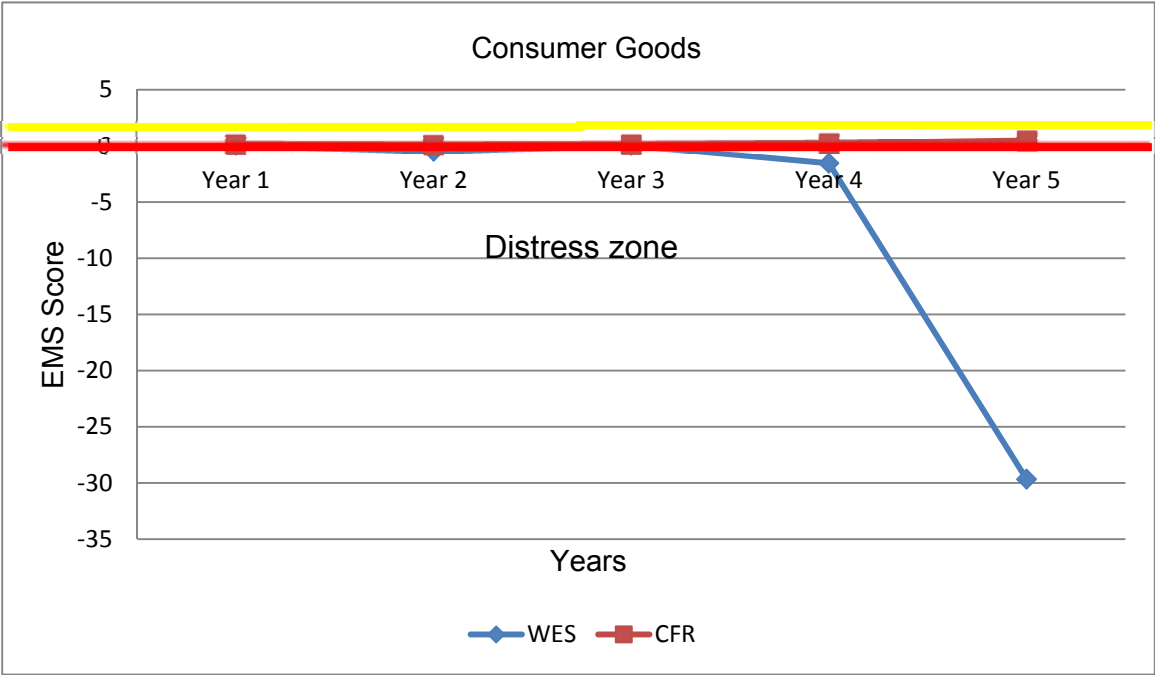
Table 4.50: EMS computation for WES and CFR

			Failed					Non-Failed				
			WES					CFR				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	6.47	0.28	2.45	0.75	1.22	2.75	2.06	1.62	1.51	1.94
X2	<u>Retained Earnings</u> Total Assets	+3.26	-29.66	-1.55	0.07	-0.48	0.06	0.48	0.24	0.13	0.09	0.14
X3	<u>EBIT</u> Total Assets	+6.72	55.46	0.90	0.59	0.04	0.36	1.28	0.89	0.89	0.83	0.59
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	76.40	46.90	17.17	16.67	32.00	1.66	2.88	2.65	2.58	3.17
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	111.92	49.77	23.52	20.24	36.89	9.42	9.32	8.54	8.27	9.10

Source: McGregor BFA (2014) adjusted for own research

In Table 4.50 the EMS for WES and CFR is discussed. The EMS fell within the safe zone for the five financial periods under review for WES. CFR’s EMS is also within the safe zone for the period of this study. Figure 4.43 below clearly indicates the visual representation of the scores in Table 4.50.

Figure 4.43: EMS for WES and CFR



Source: McGregor BFA (2014) adjusted for own research

Figure 4.43 demonstrates the EMS for both WES and CFR appears above 2.60 which an indication of the safe zone. As shown below, Table 4.51 suggests the EMS scores for PAL and SHF indicating the zones they fall in, which is the safe zone.

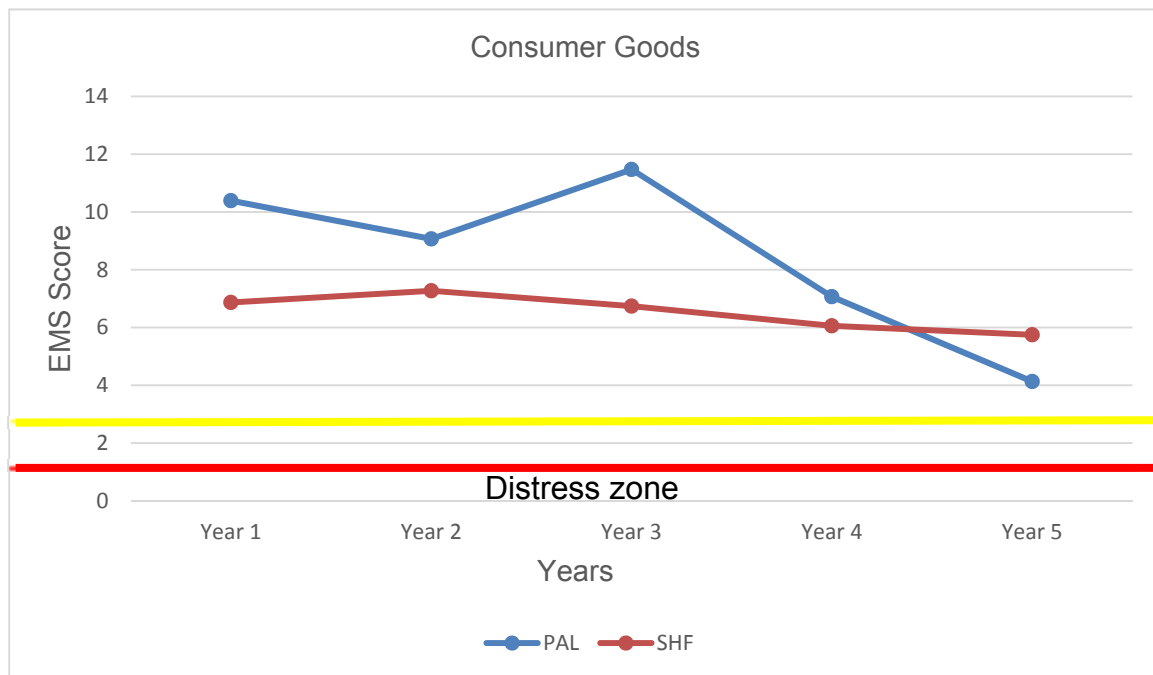
Table 4.51: EMS computation for PAL and SHF

			Failed					Non-Failed				
			PAL					SHF				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	1.62	2.89	4.03	3.89	2.94	0.73	1.38	1.90	2.50	1.97
X2	<u>Retained Earnings</u> Total Assets	+3.26	-0.55	-0.51	0.15	-0.45	0.44	0.32	0.27	0.25	0.10	0.11
X3	<u>EBIT</u> Total Assets	+6.72	-0.94	-0.34	0.36	-0.70	2.54	1.11	0.87	0.85	0.55	0.54
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	0.75	1.77	3.69	3.08	1.22	0.34	0.29	0.50	0.86	1.01
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	4.13	7.07	11.47	9.07	10.39	5.75	6.06	6.74	7.27	6.87

Source: McGregor BFA (2014) adjusted for own research

It can be observed in Table 4.51 above that both PAL and SHF's EMS occur within the safe zone for the five successive years under assessment. A year to year indication of the EMS movement is given in Table 4.51 above and is explained better graphically in the layout in Figure 4.44 below.

Figure 4.44: EMS for PAL and SHF



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.44 the results of Table 4.51 show that both the companies which failed and non-failed were above the 2.60 safe zone mark. Table 4.52 below points out whether TIW and SER fall within the three zones indicated.

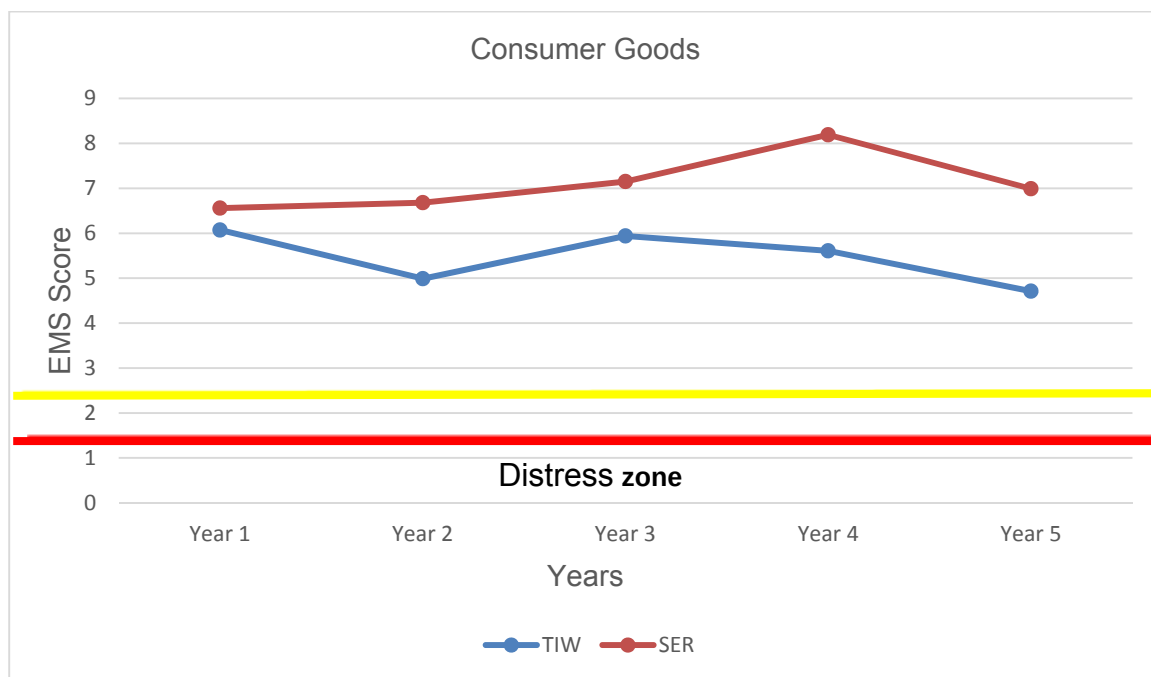
Table 4.52: EMS computation for TIW and SER

			Failed					Non-Failed				
			TIW					SER				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	0.38	0.48	1.07	0.67	0.88	1.90	2.05	2.25	1.97	1.85
X2	<u>Retained Earnings</u> Total Assets	+3.26	0.06	0.18	0.11	-0.04	0.30	0.09	0.41	0.09	0.07	0.11
X3	<u>EBIT</u> Total Assets	+6.72	0.31	0.86	0.76	0.40	0.96	0.42	1.13	0.52	0.48	0.58
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	0.71	0.84	0.75	0.70	0.67	1.33	1.35	1.03	0.90	0.77
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	4.71	5.61	5.94	4.99	6.07	6.99	8.19	7.15	6.68	6.56

Source: McGregor BFA (2014) adjusted for own research

TIW's EMS is also displayed within the safe zone for the period Y1 to Y5 and TIW is a failed company. SER is a non-failed company and it also appears within the safe zone for the period of the study as indicated in Table 4.52 above. Figure 4.45 that follows will bring graphic presentation of the EMS of TIW and SER.

Figure 4.45: EMS for TIW and SER



Source: McGregor BFA (2014) adjusted for own research

Figure 4.45 shows that both TIW and SER's EMS were above the 2.60 mark. Table 4.53 will reveal whether the EMS of RAG and SHP are above or below the safe zone. The EMS for RAG and SHP is illustrated in Table 4.53 below.

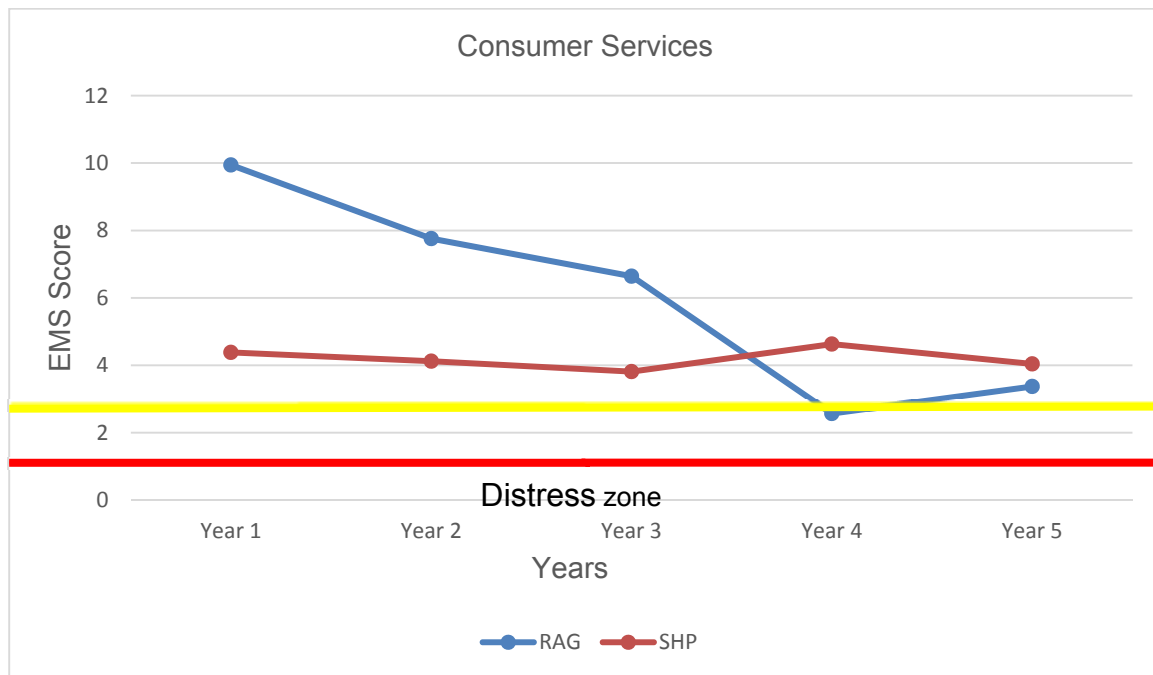
Table 4.53: EMS computation for RAG and SHP

			Failed					Non-Failed				
			RAG					SHP				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	1.98	0.79	2.00	2.47	4.36	0.04	0.36	-0.11	-0.17	-0.33
X2	<u>Retained Earnings</u> Total Assets	+3.26	-0.89	-0.76	0.05	0.18	0.27	0.07	0.09	0.04	0.16	0.18
X3	<u>EBIT</u> Total Assets	+6.72	-1.19	-0.96	0.71	1.01	1.06	0.34	0.44	0.34	0.57	0.92
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	0.23	0.26	0.63	0.85	0.99	0.33	0.49	0.29	0.31	0.35
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	3.37	2.57	6.64	7.76	9.94	4.04	4.63	3.81	4.12	4.38

Source: McGregor BFA (2014) adjusted for own research

It can be seen in Table 4.53 above that RAG's EMS computations indicate that it fell within the safe zone for Y1 till Y3 and Y5 and in Y4 it fell under the grey zone thus it is uncertain to state that the company is really bankrupt or in distress. SHP, a non-failed company's EMS calculation shows that the company falls within the safe zone for Y1 till Y5. Figure 4.46 better explains the amounts graphically below.

Figure 4.46: EMS for RAG and SHP



Source: McGregor BFA (2014) adjusted for own research

Figure 4.46 displays that in RAG falls above 2.60 in Y1 to Y3 and again in Y5. In Y4 scores were less than 2.60, but more than 1.1. For SHP the score was above 2.60 for Y1 to Y5. Table 4.54 below will showcase the EMS for TRX and WHL.

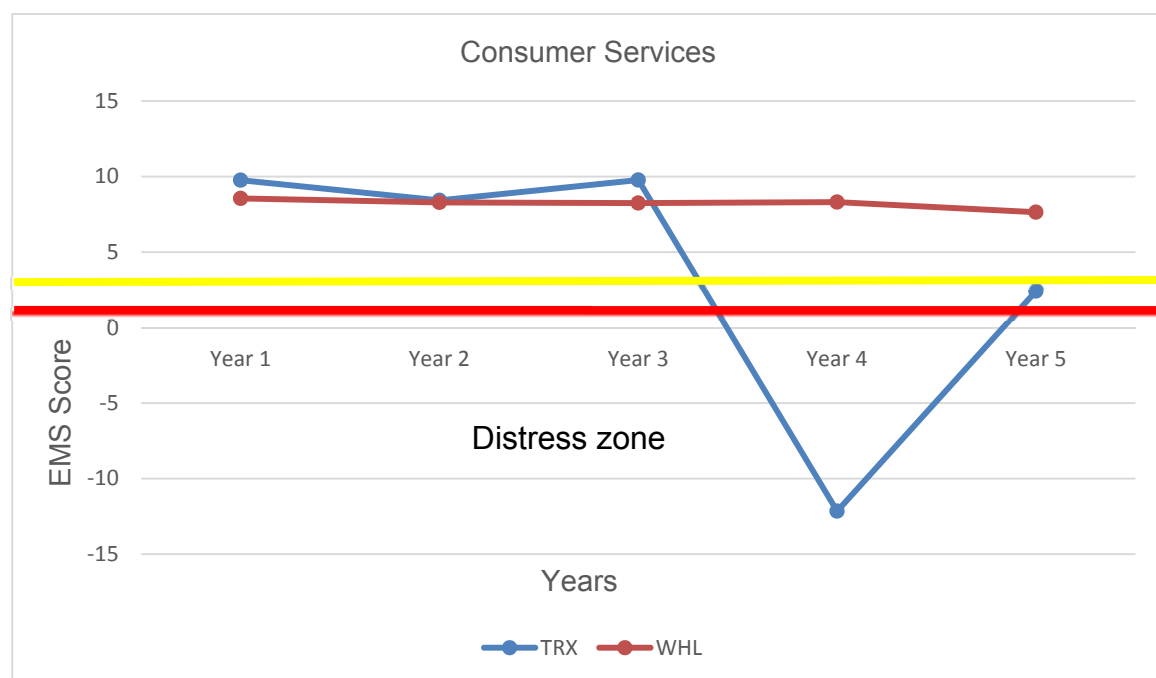
Table 4.54: EMS computation for TRX and WHL

			Failed					Non-Failed				
			TRX					WHL				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	-1.89	-0.43	0.58	1.51	1.12	1.68	1.85	1.77	1.82	1.49
X2	<u>Retained Earnings</u> Total Assets	+3.26	-0.05	-5.54	0.08	0.10	1.22	0.13	0.12	0.16	0.23	0.52
X3	<u>EBIT</u> Total Assets	+6.72	-0.09	-11.42	0.33	0.31	2.73	1.00	0.88	0.78	1.04	1.73
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	1.19	1.52	5.53	3.24	1.43	1.58	2.21	2.27	1.95	1.55
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	2.42	-12.61	9.77	8.42	9.76	7.64	8.31	8.24	8.29	8.55

Source: McGregor BFA (2014) adjusted for own research

TRX, a failed company's EMS is displayed. In Y1 till Y3 the company indicated it was in a safe zone, but in Y4 it was within the distress zone and in the grey zone in Y5, meaning in Y4 it can be said for certain that TRX was in distress but that statement cannot be for certain for the score in Y5. WHL was a non-failed company. The EMS calculation indicated that the company scores took place within the safe zone for the duration of the period under review, as shown in Table 4.54. In Figure 4.47 the graphical appearance of TRX and WHL's EMS are illustrated.

Figure 4.47: EMS for TRX and WHL



Source: McGregor BFA (2014) adjusted for own research

In Figure 4.47 it is shown TRX is above the 2.60 mark in Y1 to Y3. Y4 appeared to be below 1.1, representing the distress zone and Y5 was within the grey zone above the 1.10, but below the 2.60 mark. For WHL Y1 to Y5 is within the safe zone range for the five year period under review. NEI and HWN's EMS will be highlighted in Table 4.55 below.

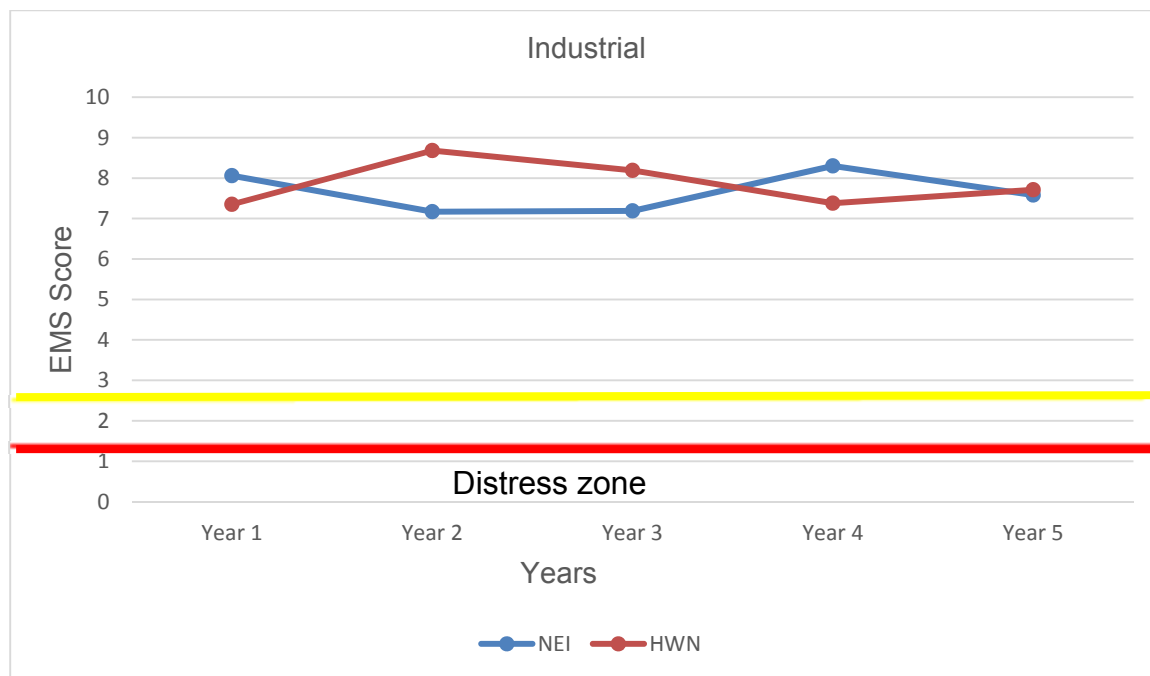
Table 4.55: EMS computation for NEI and HWN

			Failed					Non-Failed				
			NEI					HWN				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	2.02	2.13	1.83	2.21	2.27	2.25	2.28	2.40	2.47	1.80
X2	<u>Retained Earnings</u> Total Assets	+3.26	0.14	0.20	0.13	0.08	0.23	-0.09	-0.11	0.13	0.22	0.40
X3	<u>EBIT</u> Total Assets	+6.72	0.50	0.68	0.80	0.33	0.79	1.01	0.80	1.23	1.51	1.28
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	1.67	2.05	1.18	1.29	1.51	1.29	1.17	1.18	1.23	0.62
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	7.58	8.30	7.19	7.17	8.06	7.71	7.38	8.19	8.68	7.35

Source: McGregor BFA (2014) adjusted for own research

NEI, a failed company, and HWN, a non-failed company, both indicated that their EMS computation determined that these companies fell within the safe zone for the period under study as shown in Table 4.55 above. The graphical display follows in Figure 4.48.

Figure 4.48: EMS for NEI and HWN



Source: McGregor BFA (2014) adjusted for own research

Both NEI and HWN's EMS for the period Y1 to Y5 are above the 2.60 safe zone requirements as indicated in Figure 4.48 above. Table 4.56 will give a year to year indication of DLG and WKF's EMS.

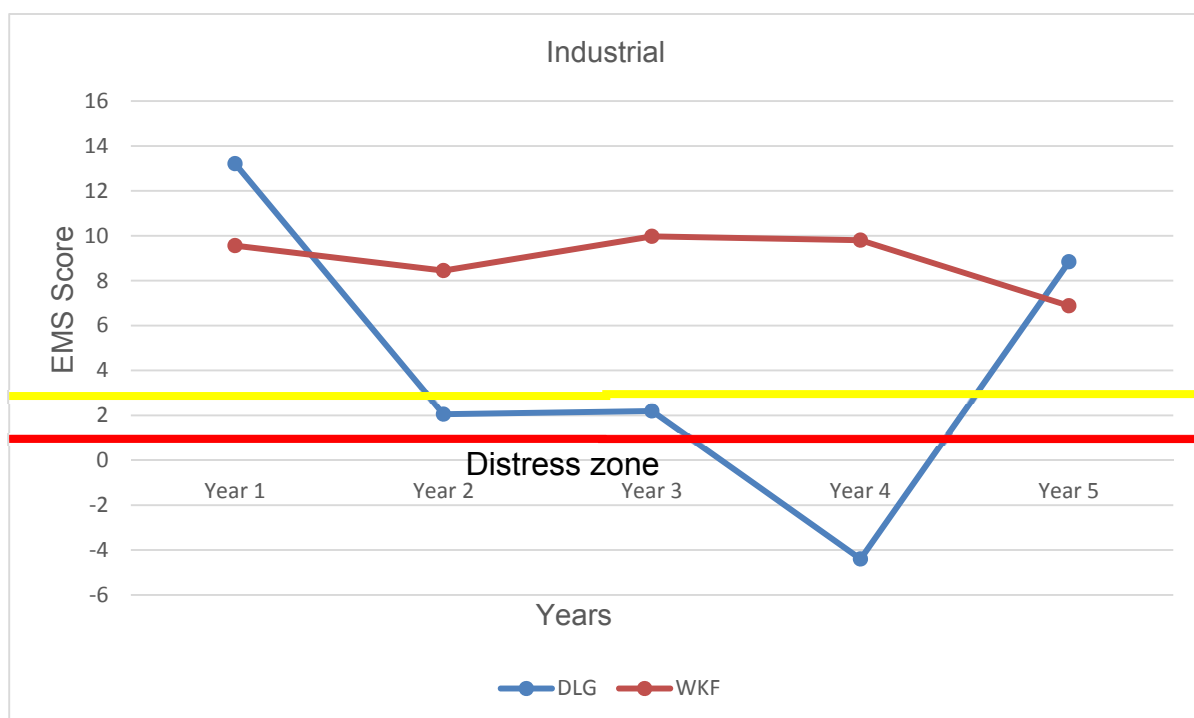
Table 4.56: EMS computation for DLG and WKF

			Failed					Non-Failed				
			DLG					WKF				
			Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
	Formula	Factor	EMS					EMS				
X1	<u>Working Capital</u> Total Assets	+6.56	-0.40	-2.99	-0.01	-2.51	4.27	2.25	5.29	5.32	3.45	3.93
X2	<u>Retained Earnings</u> Total Assets	+3.26	1.32	-1.73	-0.84	0.24	0.71	0.15	0.11	0.12	0.23	0.24
X3	<u>EBIT</u> Total Assets	+6.72	3.61	-2.97	-1.24	0.93	2.27	0.66	0.64	0.85	1.10	1.02
X4	<u>Book Value of Equity</u> Total Liabilities	+1.05	1.06	0.04	1.03	0.13	2.72	0.56	0.51	0.44	0.41	1.12
		+3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
	EMS	=	8.84	-4.40	2.19	2.05	13.21	6.88	9.80	9.97	8.45	9.56

Source: McGregor BFA (2014) adjusted for own research

The EMS of DLG, a failed company, indicated that this company fell under the safe zone in Y1 and Y5. In Y2 and Y3 it fell under the grey zone, which is a zone of uncertainty and in Y4 the company fell within the distress zone. This indicates that using the EMS on DLG successfully predicted bankruptcy. WKF, a non-failed companies' EMS computation indicated that the company fell within the safe zone for the entire review period indicating non-bankrupt prediction. The visual appearance of Table 4.56 is set out in Figure 4.49 below.

Figure 4.49: EMS for DLG and WKF



Source: McGregor BFA (2014) adjusted for own research

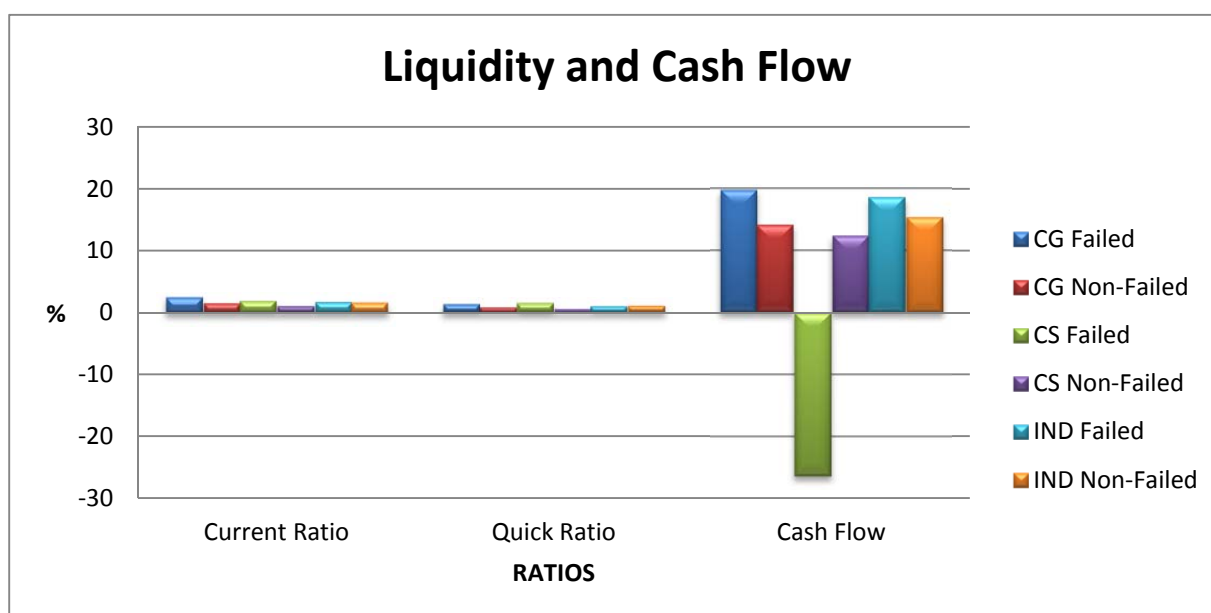
Shown in Figure 4.49, DLG in Y1 and Y5 score was >2.60 (safe zone). In Y2 and Y3 it was greater than 1.10, but less than 2.60 (grey zone) and Y4 it was within the distress zone (<1.10). WKF on the other hand was above the 2.60 mark for the entire period under review, Y1 till Y5. Using the EMS on the eight matched companies, the overall score of six non-failed companies were better than their failed counterparts. However, the score differences were minor. A concern of the EMS is that companies were mainly in the safe zone, while the traditional methods indicated the failed company's ratios were too good to be true. With the EMS being assessed for the three industries' consumer goods, consumer services and industrial industry, the summary of the research will be looked at in the next section.

4.14 SUMMARY OF RESEARCH

4.14.1 Univariate

In determining whether a company has any cash flow problems, the perfect ratios to look at in order to make the liquidity situation public, is the current ratio, quick ratio and the cash flow to debt ratio as shown below in Figure 4.50.

Figure 4.50: Indication of companies' cash flow per industry

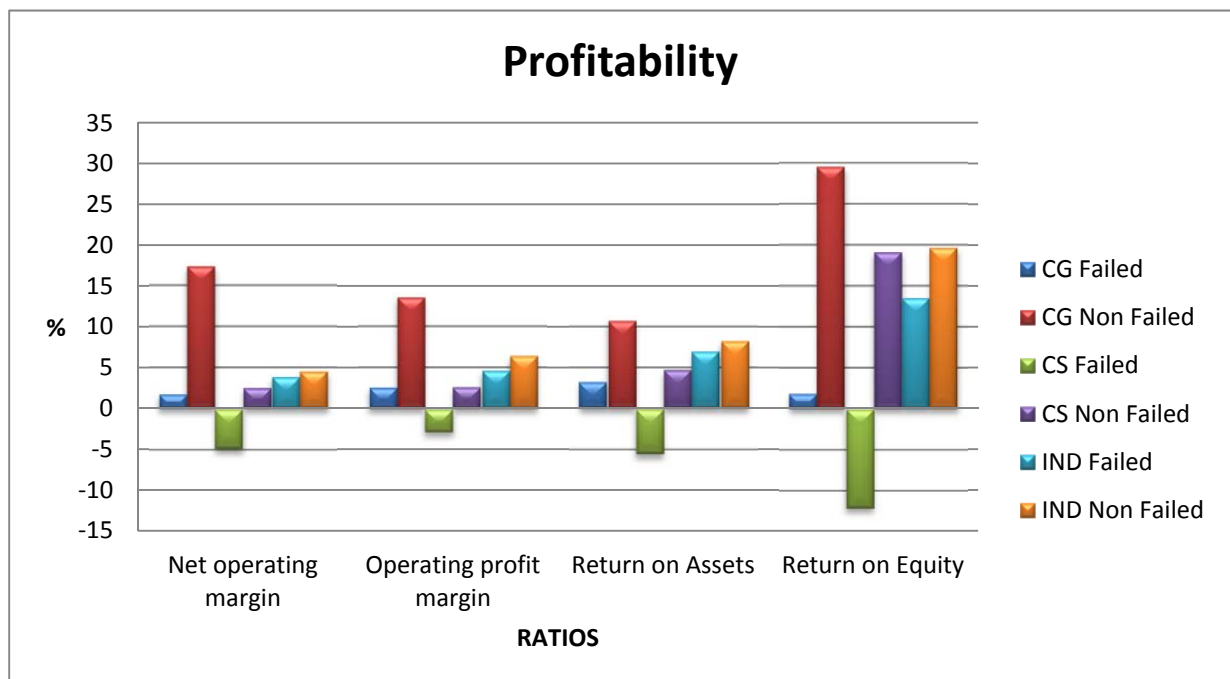


Source : McGregor BFA (2014) adjusted for own research

Figure 4.50 illustrates that the current ratio and quick ratio show no sign of concern for all three industries. There are no alarm signals for the consumer goods and industrial industries regarding cash flow, but the consumer services have had no cash flow and have been operating at a loss for the duration of the period under review.

Whether a company is using their assets as expected, is revealed through i) net profit margin ii) operating profit margin iii) return on assets and return on equity; and this is exemplified in Figure 4.51 that follows.

Figure 4.51: Indication of companies' asset use per industry

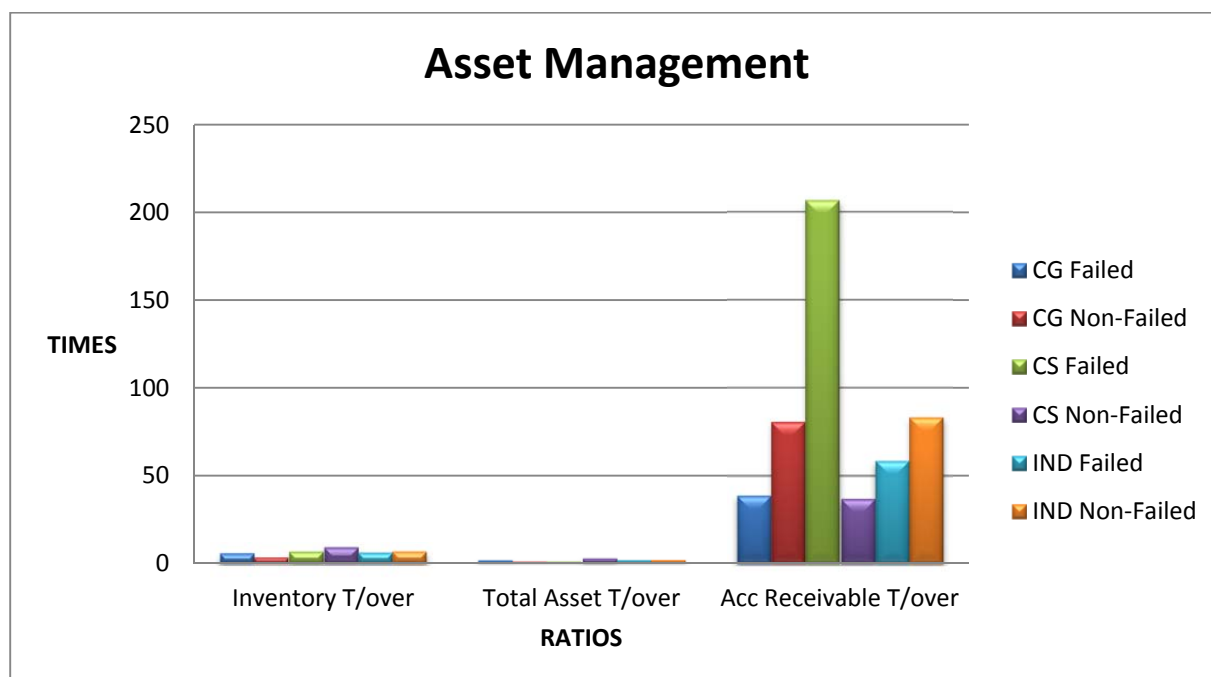


Source: McGregor BFA (2014) adjusted for own research

In Figure 4.51 above demonstrates that due to consumer service operating at a loss even before interest and tax have been paid, all the profitability ratio will be affected and reflect negative percentages, and it is expected for interest to increase due to interest being charged on interest as a result of nonpayment of debt.

Figure 4.52 depicts the company's ability to be productive is displayed by the i) inventory turnover ii) total assets turnover and iii) accounts receivable turnover. These ratios determine how quick different accounts are transformed to cash per industry.

Figure 4.52: Indication of companies' productivity ability per industry

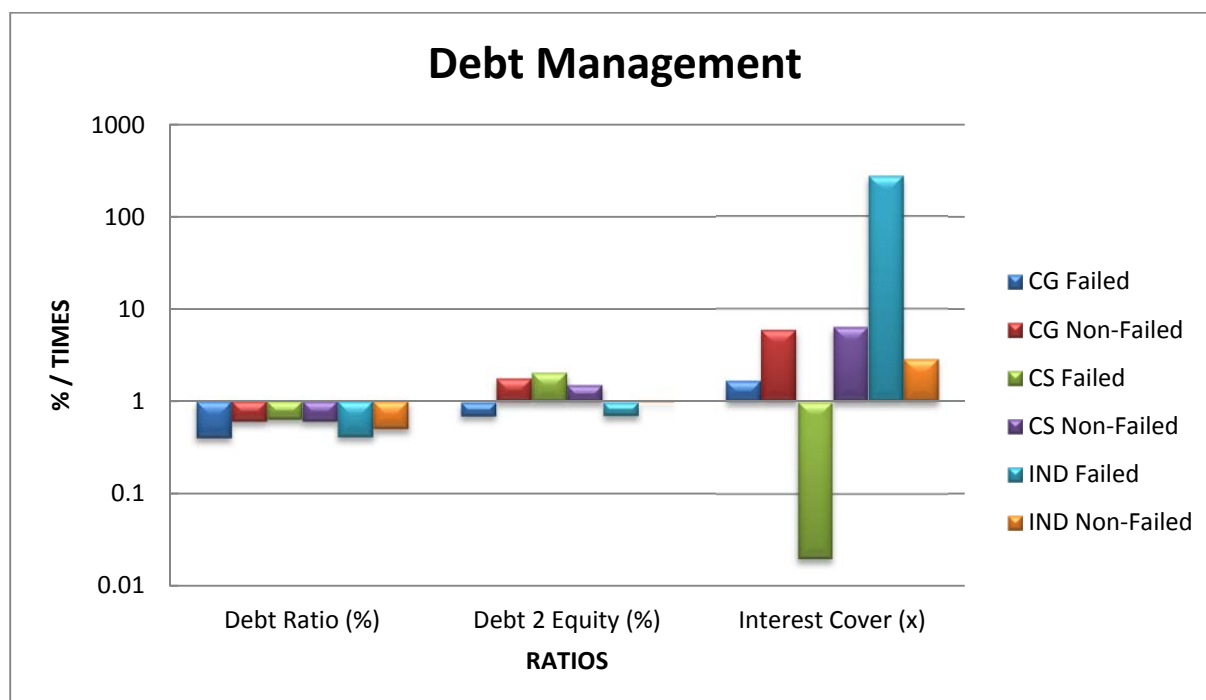


Source: McGregor BFA (2014) adjusted for own research

The companies' productivity ability is indicated in Figure 4.52 above. It reflects that all three industries have the ability to be productive, even though the assets are being turned over at a similar level for all the industries. It is a sign of concern for industrial industry. It is expected to be higher, as assets are a secondary business driver for this industry. The inventory turnover is expected to be higher for consumer goods and the services industry, compared to that of the industrial. A high accounts receivable turnover ratio is favourable, but an unnaturally high ratio as in the case of the consumer services industries, is more alarming than if it were below norm.

A company's structural changes are actually how companies finance their assets. The two sources of finance normally available to a company are debt or equity and the management thereof. Figure 4.53 below indicates the ratios affected are debt ratio, debt to equity and interest cover.

Figure 4.53: Indication of companies' structural changes per industry



Source : McGregor BFA (2014) adjusted for own research

Figure 4.53 shows the debt and debt to equity ratios are low and a low ratio is preferred. A lower ratio indicates lower obligations. On the other hand, a higher ratio is welcomed for the interest cover ratio as it indicates the number of times the earnings are higher than the interest expense. The consumer services industry is unable to pay the interest, so how will they make repayments on the debt due?.

4.14.2 Trend and Comparative Ratio Analysis

In this sub-section, the comparative outcome of the five year individual performance trend and five year averages over the period 2007-2012 of the companies within the three industries, namely consumer goods, consumer services and industrial will be discussed, and a differentiation between the failed and non-failed companies will be made as follows, failed (F) and non-failed (NF). A synopsis of possible ratio fluctuations will be given in order to bring understanding to the abnormal ratios that appear within the period being studied. The numerator and denominator decrease or increase at the same time, but at different percentage levels, so the ratio will be affected differently. If the increase in percentage of the numerator is greater than that of the denominator, the ratio will increase and the ratio will decrease if the increase of the denominator is greater than the numerator. The ratio will also increase if the

numerator increases and decreases in the denominator, meaning the increase or decrease of the numerator is not in relation with the denominator and vice versa. A negative ratio will be the result of a negative numerator or denominator.

The first set of ratios discussed in chapter 4 was the liquidity ratios consisting of the current and quick ratios according to literature where a high ratio is favourable. The highest within the three industries was WES (F) at 73.76 and the lowest was TRX (F) at 0.15, while and the highest quick asset ratio was also WES (F) at 73.76 and TRX (F) at 0.08. A high ratio is also preferred for the profitability set of ratios and TRX (F) had the highest net operating margin of 93.54 and -183.32 at the lowest in different years; DLG (F) the lowest at -20.45 and CFR (NF) had the highest of 29.18; return on assets' highest was DLG (F) 21.93 and WES (F) -207.96 and the return of equity at -1447.90 for DLG (F) and highest at 690.80 for ALC (F).

Asset management consisting of inventory turnover was at its highest at 1302.23 for WKF (NF) and the lowest was at zero for WES (F) for every year under review and DLG (F) for Y1, Y2 and Y5. The total asset turnover's highest ratio was SHP (NF) 3.77 and WES (F) at zero over the period of review. The accounts receivable turnover was at a high of 269.31 for TRX (F) and 243.05 for RAG (F).

Debt management ratios indicated as ALC (F) being the highest and WES (F) the lowest at 0.01 for the debt ratio; debt to equity maximum ratio at 29.90 for DLG (F) and minimum at -43.43 for ALC (F). The interest cover was 1286.41 for DLG (F) and 1139.88 for NEI (F) and the lowest at -13.90 for TRX (F).

The cash flow's ratio highest and lowest ratio was WES in different years: 104.98 and negative -14744. The mean of the ratio over the period of five years is illustrated in the table below.

Table 4.57: Mean of ratio over period of review

Ratio Abbreviation	Mean			
	Company code	Highest	Company code	Lowest
CACL	WES (F)	18.79	SHP (NF)	0.99
QACL	WES (F)	18.79	SHP (NF)	0.44
NPM	CFR (NF)	20.38	TRX (F)	-12.82
OPM	CFR (NF)	23.99	WES (F)	0.00
ROA	CFR (NF)	11.61	WES (F)	-42.56
ROE	ALC (F)	138.84	DLG (F)	-262.48
DR	SHP (NF)	0.75	WES (F)	0.04
D2E	DLG (F)	8.07	ALC (F)	-5.72
IntC	DLG (F)	260.46	WES (F)	0.00
ITO	WKF (NF)	800.92	WES (F)	0.00
ARTO	RAG (F)	213.49	WES (F)	0.00
TATO	SHP (NF)	3.39	WES (F)	0.00
CF2D	SHP (NF)	45.52	WES (F)	-2958.00

Source : McGregor BFA (2014) adjusted for own research

Table 4.57 indicates the mean of the company at its lowest and highest. We have learnt in literature a ratio that is above the norm or rule of thumb has always been favorable. For liquidity, profitability, asset management and cash flow, the higher the ratios the better and a lower ratio is preferred for the debt management. In this study we have found when a higher ratio is preferred and if the ratio is below the norm, it is a sign of concern, but when the preferably high ratio is found to be abnormally high or higher than the norm, it is a serious warning sign. In the context of the study we have found that the failed companies' ratios are above the norm and their performance is even better than those of the non-failed companies. On further investigation and scrutiny of the financial statements and determining reasons it has been found that the financial statement has been inflated resulting in inflated ratios.

4.14.3 EMS Model

Altman (2005:311) points out that when value is assessed of companies within emerging markets, the EMS model is best suited. Various authors (Gharaibeh *et al.*, 2013:318), Tuvadaratrgool (2013:118-120) and Altman (2005:322) conducting prior

studies that have applied the EMS model have been indicated as very successful in non-US environment including the BRICS.

The findings of the study have shown that in the first year of review, WES (F) had the highest EMS score of 36.89 and the lowest was SHP (NF) at 4.38. In the second year, WES (F) again had the highest score of 20.24 and the lowest was 2.05 for DLG (F). The third year the highest was WES (F) at a score of 23.52 and 3.81 for SHP (NF), and the fourth year WES (F) was at 49.77, the highest EMS score and TRX (F) -12.61. In the final year under review, the highest EMS was 111.92 by WES (F) and 2.42 by TRX (F).

In this study we are not disputing that the EMS model is able to predict failure successfully but what we have found, is that it does not work so well in a South African context. One failed company WES will be isolated in order to support the findings, WES known as Wesco Investments Limited, manufacturer and marketer of automobiles EMS score was the highest every year over the period of review. On the other hand, the financial ratios give totally another story of Wesco's financial condition. On further investigation of WES, financial statements over a five year period have revealed WES has no long term liabilities, inventory, sales and a negative trading profit. WES had an extraordinary profit in Y5 without any sales or inventory for the full review period. They were operating at a loss for the full period under review and the cash flow from operating activities was negative in Y2, Y4 and Y5, meaning they were no longer a going concern. It can be questioned whether WES was a going concern before the five years under review? These assumptions can be made by merely observing the financial statement data, and yet the EMS model computation result has made known that WES is in the safe zone for the entire period under review.

As mentioned in chapter four, the EMS model consists of different financial ratios and the ratio included in this model had no effect on the WES, meaning the problem financial indicators of WES are not ratios included in the model's ratios and this model contains no cash flow ratios.

4.15 CONCLUSION

In this chapter the data that was collected in Chapter 3 was applied to the traditional analysis methods (trends and comparative ratio analysis) and the EMS Model. The

data applied was then interpreted, as the objective of this chapter was to apply and interpret the data collected in order to meet the objectives set and shed light on the problem statement set out in chapter one.

We have found and agree with Low *et al.* (2001:49) that a company's financial circumstance is better reflected through its cash flow and it cannot be assumed or said that the higher its liquidity and profitability ratios are, the greater its ability of repaying its financial responsibilities are. This study concurs with Lucouw's (2013:71) conclusion "*An increasing trend is not necessarily good. Many failed companies had positive trends*".

The EMS model uses different financial ratios identified by Altman (2005) as (WC/TA), EBIT/TA), (RE/TA) and TE/TL). The problem is that only the financial indicators that are affected in those ratios will have an effect on the model and therefore a holistic picture of a company's financial condition cannot be given.

CHAPTER 5

CONCLUSION

5.1 INTRODUCTION

In the former chapter, data was collected of the sample under evaluation for the purpose of analysing and interpreting the data. A summation of the results from the interpretations made will be the purpose of the current chapter. Under the investigation in this study is whether raw data can be extracted from financial statements, apply financial ratio analysis and still predict company failure effectively and successfully. The structure in this chapter will be dealt with as follows: The objectives of chapter one will be revisited in order to determine whether the objectives have been met. As provided in chapter 1 (par 1.3.1, par 1.3.2 p4, par 1.4.1.1 p5 and par 1.4.3.1 p6) the objectives are as follows.

A. Primary objectives (par 1.3.1-p4)

- i) Objective to investigate the successful prediction of company failure of JSE listed companies by using financial ratio analysis.

B. Secondary objectives (par 1.3.2-p4)

- i) Investigate the use of financial ratio analysis as a reliable tool in predicting company failure.
- ii) Examine the principles of financial ratio analysis and also establish if these same principles are useful and can be applied as a guideline today.

C. Theoretical objectives (par 1.4.1.1-p5)

- i) Conducting a literature review on the financial ratios and bankruptcy prediction models, their development and rationale behind the development will give a better indication of their usefulness.
- ii) The validity of both the financial ratios and bankruptcy models can be determined through the literature review.

D. Empirical objectives (par 1.4.3.1-p6)

- i) Identify the JSE listed companies that failed over the period of 2007 to 2012 with accompanying reasons.
- ii) Establish if financial ratio analysis and failure prediction models can identify failure timeously on making use of failed JSE listed companies.
- iii) Test the reliability of financial ratio analysis and a failure prediction model against the Top 40 JSE listed index companies.

This will be followed by restating the problem statement as per Chapter 1 (par 1.2 p3) and determining whether this research was able to come up with a solution regarding problem statements. A brief concluding summary of chapter two will be given. In chapter three we will re-examine how and which financial indicators have been selected and utilized in the study. A brief synopsis of the limitation of the study will be discussed, followed by an overall conclusion, the contributions of the study and whether there are any recommendations. This chapter will be concluded with final remarks.

5.2 OBJECTIVES

The primary objectives A have been satisfied in Chapter 4 by way of applying the traditional ratio analysis methods known as trend and comparative ratio analysis.

The secondary objectives B

- (i) were achieved in Chapter 4 through the application of the traditional methods of analysis;
- (ii) were met in Chapter 2. The different model has been examined and applied in Chapter 4.

The theoretical objective C

- (i) was fulfilled in Chapter 4 through implementation of the traditional ratio analysis which is the trend and comparative ratio analysis.
- (ii) its objective has been met in Chapter 2.

The empirical objective D

- (i) was gratified in Chapter 3 in Table 3.2;

(ii) was fulfilled in Chapter 4 through the interpretation of the data collected, using the traditional ratio analysis and the EMS Model;

(iii) was adhered to in Chapter 4 through the application and interpretation of the data collected.

5.3 PROBLEM STATEMENT

In the midst of all these changes that have been taking place over the years, are the financial ratios that were developed in the 1930s still effective and useful in predicting company failures in the current business environment? The study has found and in agreement with prior studies concluded that the financial ratios are effective. The source from which financial ratios are obtained, data from the financial statements could be the problem, meaning the preparation or misstatement of these financial statements could minimize or eliminate the effectiveness of the financial ratios.

5.4 SUMMARY OF PRIOR CHAPTERS

Chapter 2 can be wrapped up by summarizing that through the literature review conducted, it has been found that failure prediction goes as far back as the 1930s and the ratio has been used in these prediction models since 33 B.C. Researchers could never agree on the definition or terms used for failure. It has been referred to as default, bankruptcy, insolvency, failure, corporate collapse and financial distress. This could be the reason why different studies use different methods and financial ratios, as seen in chapter 2 table 2.4 and chapter 3 table 3.10. With this being said, there is still room for improvement, even though it has been determined that the models and financial ratios are effective or useful. But the cream of the crop of these models and financial ratios has not yet been determined. With an observation of the financial ratio used by the founders of the failure prediction models together with the ratio used in this study, it can be concluded that this current study has applied a modified model making use of the majority of the financial ratio used by the trendsetters of failure prediction models as seen in Annexure 3.

In chapter 3 prospective company failure indicators were pinpointed as 44 promising financial ratios of which 17 in total were split into EMS and traditional analysis was adopted for the study. Four ratios represented the EMS and 13 the traditional analysis. The 17 ratios were depicted in five categories of financial performance namely liquidity,

profitability, asset management, debt management and cash flow. The ratio selection and the failure prediction tools used, namely trend, comparative and EMS, were discussed. Trend and comparative are measures used in the traditional ratio-based analysis. EMS is also ratio-based, but a failure prediction model. The descriptive statistics applied were the mean.

Chapter 4 highlights the different method used within the study. A mixed method has been applied consisting of qualitative and quantitative data that was collected from a secondary source. An exploratory research method was functional due to the limited knowledge on the area of study with the aim to obtain better understanding of the field of study under review.

5.5 LIMITATION OF THE STUDY

The limitation the study was exposed to the lack of financial statement data for the five year period under review before delisting. This limitation was overcome by acquiring data over a continuous five year period before delisting, not necessarily immediately before delisting. The same five years financial statement data was acquired for the matched non-failed companies. However there is a mismatch between the ABSA 2007 industry benchmarks and the 2007 - 2012 McGregor information this does not influence the findings of the study. The reason for including the benchmarks was to give guidance in the investigation of the different ratio groups. The various failed companies failed over a five year period therefore even the failed companies are a mismatch between one another and the industry norm. The mismatch of data leaves room for further study.

Another limitation was companies needed to be matched according to the closest assets size as per the matching criteria, but the non-failed companies used were companies listed on the JSE Top 40 index companies and these companies were well established companies as they have been around for many years. Table 5.1 below exhibits the non-failed groups of companies the failed companies were matched with, the year they were founded and the industry.

Table 5.1: Non-failed companies used in sample

Company	JSE code	Founded	Industry
Metair Investment Ltd	MTA	1948	Consumer Goods
Compagnie Financiere Richemont	CFR	1988	Consumer Goods
Steinhoff International Holdings Ltd	SHF	1964	Consumer Goods
Searidel Investments	SER	1968	Consumer Goods
Shoprite Holdings Ltd	SHP	1979	Consumer Services
Woolworths Holdings	WHL	1931	Consumer Services
Howden Africa Holdings	HWN	1854	Industrial
Workforce Holding	WKF	1972	Industrial

Source: McGregor BFA (2014) adjusted for own research

Table 5.1 shows the years in which the non-failed controlled group companies were founded; it is an indication why the huge difference in asset size is expected.

The limitation was brought under control by using assets size as only a guide and not as if set in stone. The last limitation which came across industries could not be compared among one another due to the impact of differences of financial indicator, for instance the technology industry is expected to have high research and development, while the consumer service or consumer goods industries will not have the same situation. This limitation was overcome by only comparing companies within the same industry. Previous study conducted by Kidane (2004:170) on predicting financial distress on IT service companies in South Africa, experienced similar limitations:

1. i) problem with data collection, lack of financial statement availability;
2. ii) problem with matching, absence of suitable sample companies within the same industry.

5.6 CONCLUSION AND CONTRIBUTION

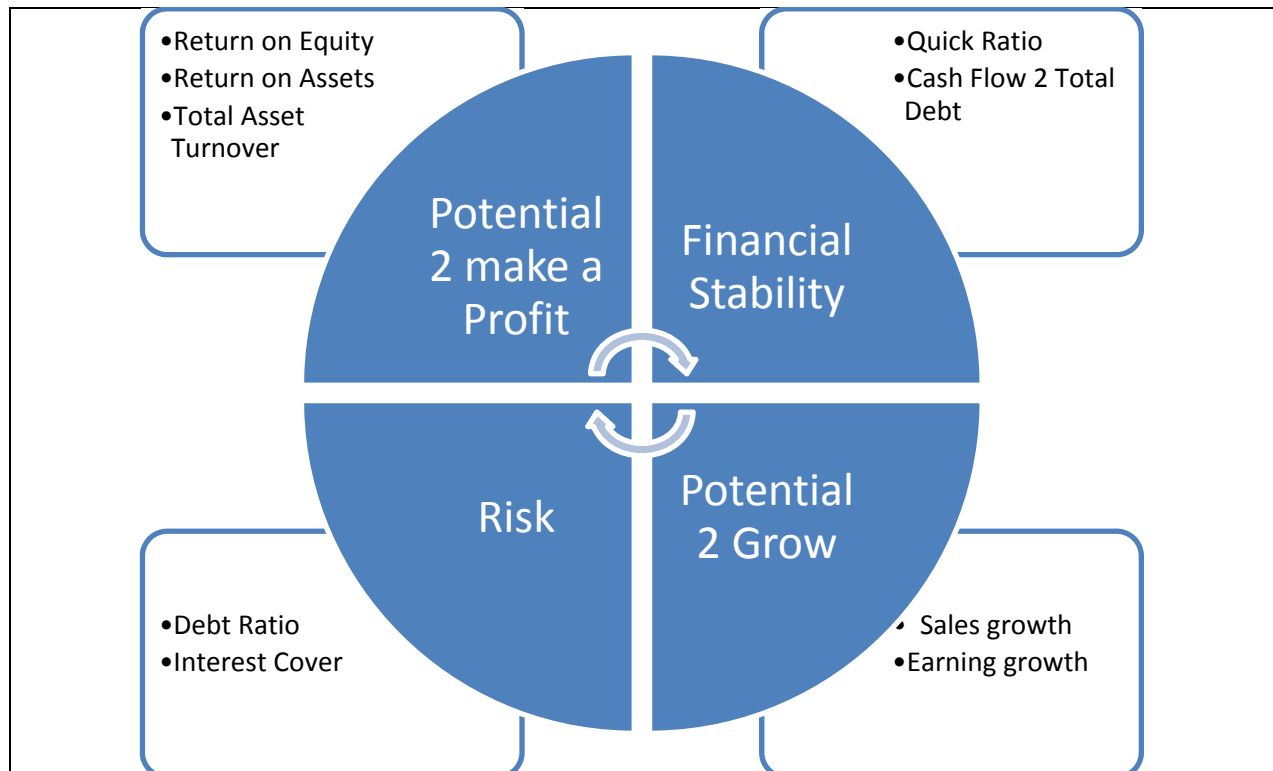
The finding of this study is in line and in agreement with the findings of previous studies that financial ratio are useful in predicting company failure. A similar study was

conducted in Thailand by S.Tuvadaratragool in 2013 and it was found that all the methods applied were successful predictors of failure, both the traditional analysis and EMS model. Our findings indicate the traditional analysis methods can successfully predict company failure, but the EMS model is not as successful in a South African context.

5.7 RECOMMENDATIONS

Due to company failure having many contributors and South African being so diverse, it is difficult to apply models developed on an American or European basis and expecting them to be successful in South Africa. My recommendation of further studies is that the studies should be entirely within a South African context and taking into consideration the limitations of traditional methods. Financial ratios that are an information source, are financial statements and the different financial statement have different objectives, for instance the statement of financial positions gives balances as at a specific period of time and the statement of comprehensive income and statement of cash flow is over a period of time. In order to make the interpretations more fitting, quarterly financial information should be used rather than annual, in order to identify any abnormal changes as soon as possible. To develop a model per industry due to vast industry differences or a model that is flexible and can be changed according to industry changes, the model should also look at the pillars of a company's financial health by taking into account whether the companies have the potential to make a profit, their financial stability, their potential to grow and their financing risk. The model should be split into two levels: level one should determine whether the company is solvent or not and level two should investigate to identify where the problem lies. In Figure 5.1 below is a prototype of such a model at level one.

Figure 5.1: Level one solvency prediction model



Source : Own research

In Figure 5.1 level one of solvency prediction illustrates companies' profit potential and the ratio indicates whether the assets and equity are used effectively and are generating returns. With the financial stability, the quick ratio was used as the current ratio skews results because some companies might have a lot of inventory which is obsolete, meaning a company is basing its liquidity on inventory they might not even be able to sell or might sell at a loss and yet may not be able to repay the short term obligations. Cash flow is important because if a company has insufficient cash flow, they are unable to continue as a going concern. Growth potential ratio used is to indicate whether the company's sales and earnings are growing and the risk gives an indication of the financing used by the company and whether they can at least repay the interest obligations. If a problem has been identified in level one, level two will be used to narrow down the problem area.

5.8 FURTHER STUDIES

Vigario (2008:220) divided industries into capital, for instance basic resources, oil and gas and telecommunications, and non-capital intensive companies, for example for the consumer goods and consumer services industry. Capital intensive companies normally

have high risk, high break-even, high fixed cost, low or zero variable cost and are highly geared, and these companies can go bankrupt by a dropping in sales. The non-capital intensive companies are vice versa and these companies are not on the brink of bankruptcy when there is a drop in sales. The model described above is for further studies because the objectives of a company depend on the nature of a business, for instance supermarkets' objective is high asset turnover rate with low profit margin and, on the other hand, specialist companies aim at a high profit margin with low asset turnover rate. Further research is required to assist stakeholders of South African companies to predict business failure successfully, by developing an adjusted model within a South African context.

Finally, in conclusion, the aim of the study was met, as mentioned in par 5.2. The objectives were achieved, looking at the literature in as far as the necessity, development and foundation's previous models were based on including the objective of the models. The application of the traditional methods and EMS model assisted in meeting the objectives set out in chapter 1. Most importantly, the study proved that the financial ratios developed in the 1930s can still effectively predict bankruptcy.

The conclusion of the study was based on data analysis of 16 companies' comprising of eight failed companies and eight non-failed companies. This showed explicitly that the financial ratios used successfully predicted bankruptcy in the failed group, while no distress signals were predicted in the non-failed group. The companies were paired based on the same industry, same fiscal period and the closest assets size. The paired groups data (failed and non-failed) was then compared, using 17 financial ratios. It was further concluded that although the failure predictor models successfully predict distress signals, it should not be used in isolation. Using different ratios and combining models enhance the usefulness of the results.

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ANNEXURES

ANNEXURE 1

FAILURE PREDICTION STUDIES RELIANT ON FINANCIAL RATIO DURING 1968 – 2004

Author and Year	Author and Year	Author and Year
(Beaver, 1966, 1968)	(Takahashi and Kurokawa, 1984)	(Ward, 1993, 1994)
(Tamari, 1966)	(Zmijewski, 1984)	(Ambrose and Carroll, 1994)
(Altman, 1968, 1971, 1973, 1976, 1978, 1982, 1983, 1994)	(Casey and Bartczak, 1985)	(Brockett <i>et al.</i> , 1994)
(Johnson, 1970)	(Frydman <i>et al.</i> , 1985)	(Johnsen and Melicher, 1994)
(Meyer and Pifer, 1970)	(Gentry <i>et al.</i> , 1985, 1987)	(Platt <i>et al.</i> , 1994)
(Lev, 1971)	(Levitan and Knoblett, 1985)	(Poston and Harmon, 1994)
(Deakin, 1972)	(Zavgren, 1985)	(Sheppard and Fraser, 1994)
(Edmister, 1972)	(Doukas, 1986)	(Wilson and Sharda, 1994)
(Altman and McGough, 1974)	(Keasey and Watson, 1986, 1987)	(Boritz <i>et al.</i> , 1995)
(Blum, 1974)	(Lawrence and Bear, 1986)	(Gadenne and Iselin, 1995)
(Elam, 1975)	(Lo, 1986)	(Harrison, 1995)
(Libby, 1975)	(Menon and Schwartz, 1986)	(Lacher <i>et al.</i> , 1995)
(Altman and Loris, 1976)	(Betts and Belhoul, 1987)	(Slowinski and Zopounidis, 1995)
(Altman <i>et al.</i> , 1977)	(Crapp and Stevenson, 1987)	(Wilson <i>et al.</i> , 1995)
(Moyer, 1977)	(Gombola <i>et al.</i> , 1987)	(Henebry, 1996)

Author and Year	Author and Year	Author and Year
(Taffler and Tisshaw, 1977)	(Karels and Prakash, 1987)	(Hill and Perry, 1996)
(Ketzer, 1978)	(Lau, 1987)	(Lee <i>et al.</i> , 1996)
(Altman <i>et al.</i> , 1979)	(Libby <i>et al.</i> , 1987)	(Clark <i>et al.</i> , 1997)
(Norton and Smith, 1979, 1980)	(Peel, 1987)	(Etheridge and Sriram, 1997)
(Walker <i>et al.</i> , 1979)	(Ambrose and Seward, 1988)	(Hwang <i>et al.</i> , 1997)
(Altman and Levallee, 1980)	(Dambolena and Shulman, 1988)	(Kane <i>et al.</i> , 1998)
(Casey, 1980)	(Dugan and Zavgren, 1988)	(Lenard <i>et al.</i> , 1998)
(Collins, 1980)	(Gahlon and Vigeland, 1988)	(McGurr and Devaney, 1998)
(Dambolena and Khoury, 1980)	(Zavgren <i>et al.</i> , 1988)	(Mossman <i>et al.</i> , 1998)
(Largay and Stickney, 1980)	(Zavgren and Friedman, 1988)	(Richardson <i>et al.</i> , 1998)
(Ohlson, 1980)	(Barniv and Raveh, 1989)	(Kim and McLeod Jr., 1999)
(Sharma and Mahajan, 1980)	(Hopwood <i>et al.</i> , 1989, 1994)	(Kyung <i>et al.</i> , 1999)
(Zimmer, 1980)	(Peel and Wilson, 1989)	(Laitinen and Kankaanpaa, 1999)
(Castagna and Matolcsy, 1981)	(Barniv and Hershberger, 1990)	(Lennox, 1999)
(Chen and Shimerda, 1981)	(Gilbert <i>et al.</i> , 1990)	(Barniv <i>et al.</i> , 1999)
(Scott, 1981)	(Keasey and McGuinness, 1990)	(Dimitras <i>et al.</i> , 1999)
(Siegel, 1981)	(Keasey <i>et al.</i> , 1990)	(Yang <i>et al.</i> , 1999)
(Collins and Green, 1982)	(Koh and Killough, 1990)	(Zopounidis and Doumpos, 1999)

Author and Year	Author and Year	Author and Year
(Taffler, 1982, 1983, 1984)	(Platt and Platt, 1990, 1991)	(Bongini <i>et al.</i> , 2000)
(El-Hennawy and Morris, 1983)	(Skogsvik, 1990)	(Charalambous <i>et al.</i> , 2000)
(Hamer, 1983)	(Coats and Fant, 1991, 1993)	(Gritta <i>et al.</i> , 2000)
(Mensah, 1983)	(Flagg and Giroux, 1991)	(Laitinen and Laitinen, 2000)
(Richardson and Davidson, 1983)	(Koh, 1991)	(Zapranis and Ginoglou, 2000)
(Zavgren, 1983)	(Laitinen, 1991, 1994)	(Beynon and Peel, 2001)
(Casey and Bartczak, 1984)	(Luoma and Laitinen, 1991)	(Catanach Jr. and Perry, 2001)
(Houghton and Sengupta, 1984)	(Molinero and Ezzamel, 1991)	(Drezner <i>et al.</i> , 2001)
(Izan, 1984)	(Aly <i>et al.</i> , 1992)	(Lin and McClean, 2001)
(Lincoln, 1984)	(Bahnson and Bartley, 1992)	(Ginoglou <i>et al.</i> , 2002)
(Marais <i>et al.</i> , 1984)	(Baldwin and Glezen, 1992)	(Darayseh <i>et al.</i> , 2003)
(Micha, 1984)	(Piesse and Wood, 1992)	(Charitou <i>et al.</i> , 2004)
(Mutchler, 1984)	(Tam and Kiang, 1992)	(Jones and Hensher, 2004)
(Richardson and Davidson, 1984)	(Fletcher and Goss, 1993)	(Neophytou and Molinero, 2004)

Source: adopted from Hossari (2006:36-37).

ANNEXURE 2

JSE TOP 40 INDEX COMPANIES

Company	JSE Code	Industry	Year founded	Included in sample
British American Tobacco	BTI	Consumer goods	1902	X
SAB Miller	SAB	Consumer goods	2002	X
Compagnie Financiere Richemont	CFR	Consumer goods	1988	√
Tiger Brands	TBS	Consumer goods	1921	X
Steinhoff International Holding	SHF	Consumer goods	1964	√
Naspers	NPN	Consumer services	1915	X
Shoprite Holding	SHP	Consumer services	1979	√
Woolworths Holding	WHL	Consumer services	1931	√
Massmart Holding	MSM	Consumer services	1990	X
Truworths	TRU	Consumer services	1917	X
Aspen Pharmacare Holding	APN	Health Care	1997	X
Mediclininc International	MDC	Health Care	1983	X
Remgro	REM	Industrial	1940	X
Bidvest Group	BVT	Industrial	1988	X
Imperial Holding	IPL	Industrial	1947	X
Sasol	SOL	Oil and Gas	1950	X
MTN Group	MTN	Telecommunication	1994	X
Vodacom Group	VOD	Telecommunication	1993	X

Source: Courtney Capital(2014) adjusted for own research

ANNEXURE 3

RATIO INTEGRATED TABLE

Ratio	Beaver (1966)	Altman (1968)	Edmister (1972)	Blum (1974)	Modified model (2014)
Net income/Total assets	√				√
EAT/Total assets		√			
Net income/Common equity				√	√
Net worth/Sales			√		√
Sales/Total assets		√			√
Working capital/Total assets	√	√			√
Total liabilities/Total assets	√				√
Total liabilities/Net worth				√	
Funds flow/Total debt		√		√	√
Funds flow/Current liabilities			√		
Retained Earnings/Total asset		√			√
Current assets/Current liabilities	√				√
Quick assets/Current liabilities			√		√
Current liabilities/Net worth			√		
Inventory/Sales	√	√			√
Quick assets to inventory				√	

Source: Chen and Shimerda (1981:57) adjusted for own research.

ANNEXURE 4

FINANCIAL RATIOS

CONSUMER GOODS										
Company Name	ALC					MTA				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	3.55	0.59	1.57	1.90	1.03	2.61	2.52	2.76	2.62	1.85
Quick Ratio	2.11	0.32	0.87	1.19	0.63	1.42	1.33	1.39	1.56	0.81
Net Profit Margin %	20.32	-9.81	-6.40	7.45	7.18	8.19	3.55	5.53	8.93	4.96
Operating Profit Margin %	9.51	-2.81	-0.72	11.22	13.22	11.46	6.49	8.84	8.92	8.44
Return On Assets %	10.65	-4.55	-1.16	11.52	18.68	13.91	6.94	9.27	10.23	12.08
Return On Equity %	19.75	690.80	-81.35	25.22	39.75	18.91	8.13	10.93	12.55	14.57
Inventory turnover	7.58	6.17	6.04	5.10	8.20	5.51	5.43	4.84	6.33	5.69
Total Assets Turnover	1.12	1.62	1.62	1.33	2.00	1.70	1.59	1.52	1.67	1.94
Accounts Receivable turnover	67.62	68.52	75.17	80.67	70.65	60.63	58.37	52.47	41.81	50.39
Debt / Assets	0.79	1.02	0.88	0.70	0.64	0.32	0.28	0.27	0.31	0.36
Debt / Equity	3.69	-43.43	7.01	2.36	1.75	0.47	0.39	0.38	0.45	0.57
Interest Cover	1.65	-0.39	-0.13	3.72	6.24	18.07	9.43	10.08	9.47	5.88
Cash Flow To Total Debt	-2.67	-2.33	20.82	-20.99	5.50	22.15	27.74	4.06	53.63	29.19

Company Name	WES					CFR				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	73.76	2.92	7.47	2.94	6.86	2.17	2.37	2.02	1.92	2.39
Quick Ratio	73.76	2.92	7.47	2.94	6.86	1.16	1.39	1.22	1.14	1.42
Net Profit Margin %	0.00	0.00	0.00	0.00	0.00	20.31	24.73	22.91	19.59	14.37
Operating Profit Margin %	0.00	0.00	0.00	0.00	0.00	26.44	29.18	25.92	23.51	14.88
Return On Assets %	-207.96	-5.40	-3.07	0.11	3.51	18.86	11.46	11.45	10.12	6.18
Return On Equity %	-210.81	-5.52	-3.25	0.12	3.63	29.86	15.22	15.50	13.85	7.86
Inventory turnover	0.00	0.00	0.00	0.00	0.00	2.20	2.02	2.59	2.63	2.44
Total Assets Turnover	0.00	0.00	0.00	0.00	0.00	0.80	0.45	0.50	0.52	0.50
Accounts Receivable turnover	0.00	0.00	0.00	0.00	0.00	37.66	46.39	43.69	43.82	52.54
Debt / Assets	0.01	0.02	0.06	0.06	0.03	0.39	0.27	0.28	0.29	0.25
Debt / Equity	0.01	0.02	0.06	0.06	0.03	0.63	0.37	0.40	0.41	0.33
Interest Cover	0.00	0.00	0.00	0.00	0.00	37.76	42.97	36.79	44.04	27.65
Cash Flow To Total Debt	-14744.41	-295.25	104.48	40.13	101.01	44.34	37.10	40.10	38.84	36.79

Company Name	PAL					SHF				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	1.43	2.26	4.34	3.45	2.01	1.25	1.52	1.74	2.29	1.91
Quick Ratio	0.82	1.09	2.55	2.01	1.45	0.96	1.18	1.37	1.94	1.61
Net Profit Margin %	-8.16	-3.49	2.08	-6.20	15.04	7.32	6.45	10.17	6.21	4.64
Operating Profit Margin %	-5.96	-2.69	2.64	-0.74	15.54	8.72	9.07	10.89	15.58	13.37
Return On Assets %	-12.37	-6.78	5.67	-3.75	15.33	9.59	11.09	9.23	11.76	13.78
Return On Equity %	-36.81	-13.01	6.17	-6.69	26.43	23.04	38.03	22.75	21.47	23.69
Inventory turnover	5.93	5.22	6.55	6.38	6.81	10.62	9.80	6.51	7.84	11.13
Total Assets Turnover	2.08	2.13	2.15	2.22	1.70	1.38	1.37	0.95	0.82	1.09
Accounts Receivable turnover	82.54	63.38	55.23	62.42	89.00	61.80	66.95	105.46	120.46	90.61
Debt / Assets	0.58	0.37	0.22	0.25	0.46	0.75	0.78	0.68	0.55	0.51
Debt / Equity	1.40	0.59	0.28	0.34	0.86	3.05	3.61	2.11	1.22	1.04
Interest Cover	-4.20	-4.10	6.51	-1.33	23.19	3.09	4.36	5.40	6.13	6.74
Cash Flow To Total Debt	-31.67	-18.53	55.70	10.33	60.37	13.33	14.61	7.88	18.68	15.25

Company Name	TIW					SER				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	1.16	1.17	1.39	1.23	1.29	1.91	1.98	2.08	1.84	1.77
Quick Ratio	0.69	0.68	0.89	0.70	0.77	1.04	1.14	1.18	0.98	0.97
Net Profit Margin %	1.88	6.37	4.52	1.01	8.42	2.61	8.74	2.40	1.91	2.78
Operating Profit Margin %	4.09	7.45	8.21	8.69	4.75	3.94	3.31	5.20	7.13	6.10
Return On Assets %	3.30	8.75	11.19	13.13	5.85	5.04	4.03	7.66	10.99	8.27
Return On Equity %	4.90	15.98	22.92	25.24	8.94	4.87	2.29	7.69	15.15	8.87
Inventory turnover	6.50	6.82	7.86	6.95	5.65	5.00	5.60	5.29	5.11	4.78
Total Assets Turnover	1.10	1.44	1.64	1.66	1.35	1.38	1.50	1.52	1.57	1.40
Accounts Receivable turnover	65.12	49.44	55.45	61.18	87.50	69.70	69.18	70.33	70.30	80.98
Debt / Assets	0.60	0.56	0.58	0.60	0.61	0.44	0.44	0.50	0.54	0.58
Debt / Equity	1.48	1.25	1.40	1.49	1.56	0.79	0.78	1.02	1.17	1.36
Interest Cover	3.39	6.47	8.17	4.80	2.73	2.34	1.82	2.05	2.79	1.89
Cash Flow To Total Debt	13.07	25.06	26.45	38.50	8.48	10.97	13.64	20.07	9.21	11.49

CONSUMER SERVICES										
Company Name	RAG					SHP				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	1.67	1.18	1.60	1.68	4.12	1.01	1.08	0.98	0.96	0.93
Quick Ratio	1.33	0.92	1.27	1.41	3.31	0.50	0.48	0.45	0.39	0.38
Net Profit Margin %	-22.05	-20.90	1.65	7.29	8.22	1.26	1.32	0.82	2.24	2.21
Operating Profit Margin %	-6.50	4.39	11.36	13.56	15.68	2.27	2.01	1.72	2.84	3.46
Return On Assets %	-8.66	3.09	10.22	12.01	12.70	6.74	6.61	5.38	7.96	9.50
Return On Equity %	-99.88	-21.10	5.84	16.99	17.74	26.22	16.73	15.56	30.72	30.62
Inventory turnover	8.03	6.49	5.81	7.34	5.95	9.01	8.68	8.28	7.05	10.11
Total Assets Turnover	1.24	1.13	0.98	1.09	1.02	3.21	3.56	3.35	3.04	3.77
Accounts Receivable turnover	166.45	189.71	237.96	230.30	243.05	22.50	22.29	26.78	33.69	11.07
Debt / Assets	0.82	0.80	0.63	0.55	0.51	0.76	0.68	0.78	0.77	0.75
Debt / Equity	4.64	3.97	1.67	1.24	1.06	3.14	2.13	3.59	3.40	3.00
Interest Cover	-0.89	0.67	1.38	3.34	3.92	17.80	5.66	2.90	8.83	7.09
Cash Flow To Total Debt	-7.72	0.01	-20.19	-104.25	-22.59	22.22	22.05	13.44	0.47	0.84

Company Name	TRX					WHL				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Current Ratio	0.15	0.73	2.09	4.46	1.83	1.69	1.88	1.86	1.81	1.58
Quick Ratio	0.08	0.66	2.01	4.36	1.81	1.35	1.46	1.42	1.31	1.15
Net Profit Margin %	-1.78	-183.32	13.37	14.08	93.54	3.81	3.84	3.92	4.38	9.46
Operating Profit Margin %	1.27	-2.55	13.52	14.53	7.66	7.49	6.77	6.96	7.88	13.73
Return On Assets %	1.07	-2.36	4.84	4.53	3.04	10.39	7.73	9.55	11.87	18.38
Return On Equity %	1.73	-4.28	5.74	5.93	3.17	15.43	9.96	11.96	13.81	25.93
Inventory turnover	33.10	56.09	57.41	47.19	89.21	16.86	13.94	13.10	11.70	10.51
Total Assets Turnover	0.84	0.93	0.36	0.32	0.42	2.14	1.87	1.82	1.99	1.78
Accounts Receivable turnover	8.79	7.82	127.85	66.93	269.31	71.84	76.67	71.30	68.56	78.44
Debt / Assets	0.47	0.41	0.16	0.24	0.42	0.40	0.32	0.32	0.35	0.40
Debt / Equity	0.88	0.69	0.19	0.32	0.73	0.66	0.48	0.46	0.54	0.68
Interest Cover	7.15	-13.90	412.00	87.69	2.67	14.27	12.85	9.28	5.45	8.34
Cash Flow To Total Debt	29.87	89.82	10.92	144.99	-47.98	21.49	36.80	40.57	36.20	13.06

ANNEXURE 5

EMERGING MARKET SCORE

CONSUMER GOODS										
Company Name	ALC					MTA				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.26	-0.39	0.22	0.33	0.02	0.42	0.37	0.40	0.40	0.28
Retained earnings to Total assets	0.23	-0.15	-0.10	0.10	0.14	0.11	0.03	0.06	0.12	0.07
Return on Assets	0.29	-0.04	-0.01	0.17	0.26	0.21	0.10	0.14	0.21	0.17
Total equity to Total liabilities	0.27	-0.02	0.14	0.42	0.57	2.11	2.56	2.65	2.22	1.76
Company Name	WES					CFR				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.99	0.04	0.37	0.11	0.19	0.42	0.31	0.25	0.23	0.30
Retained earnings to Total assets	-9.10	-0.48	0.02	-0.15	0.02	0.15	0.07	0.04	0.03	0.04
Return on Assets	8.25	0.13	0.09	0.01	0.05	0.19	0.13	0.13	0.12	0.09
Total equity to Total liabilities	72.76	44.66	16.35	15.88	30.48	1.58	2.74	2.52	2.46	3.02
Company Name	PAL					SHF				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.25	0.44	0.61	0.59	0.45	0.11	0.21	0.29	0.38	0.30
Retained earnings to Total assets	-0.17	-0.16	0.04	-0.14	0.13	0.10	0.08	0.08	0.03	0.03
Return on Assets	-0.14	-0.05	0.05	-0.10	0.38	0.16	0.13	0.13	0.08	0.08
Total equity to Total liabilities	0.71	1.69	3.51	2.94	1.16	0.33	0.28	0.47	0.82	0.96
Company Name	TIW					SER				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.06	0.07	0.16	0.10	0.13	0.29	0.31	0.34	0.30	0.28
Retained earnings to Total assets	0.02	0.05	0.03	-0.01	0.09	0.03	0.13	0.03	0.02	0.03
Return on Assets	0.05	0.13	0.11	0.06	0.14	0.06	0.17	0.08	0.07	0.09
Total equity to Total liabilities	0.68	0.80	0.71	0.67	0.64	1.27	1.29	0.98	0.86	0.73

CONSUMER SERVICES										
Company Name	RAG					SHP				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.30	0.12	0.31	0.38	0.67	0.01	0.05	-0.02	-0.03	-0.05
Retained earnings to Total assets	-0.27	-0.23	0.02	0.06	0.08	0.02	0.03	0.01	0.05	0.06
Return on Assets	-0.18	-0.14	0.11	0.15	0.16	0.05	0.07	0.05	0.08	0.14
Total equity to Total liabilities	0.22	0.25	0.60	0.81	0.95	0.32	0.47	0.28	0.29	0.33
Company Name	TRX					WHL				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	-0.29	-0.06	0.09	0.23	0.17	0.26	0.28	0.27	0.28	0.23
Retained earnings to Total assets	-0.02	-1.70	0.02	0.03	0.37	0.04	0.04	0.05	0.07	0.16
Return on Assets	-0.01	-1.70	0.05	0.05	0.41	0.15	0.13	0.12	0.15	0.26
Total equity to Total liabilities	1.14	1.45	5.27	3.09	1.36	1.50	2.10	2.17	1.86	1.47
INDUSTRIAL										
Company Name	NEI					HWN				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	0.31	0.32	0.28	0.34	0.35	0.34	0.35	0.37	0.38	0.27
Retained earnings to Total assets	0.04	0.06	0.04	0.03	0.07	-0.03	-0.03	0.04	0.07	0.12
Return on Assets	0.07	0.10	0.12	0.05	0.12	0.15	0.12	0.18	0.22	0.19
Total equity to Total liabilities	1.59	1.95	1.13	1.23	1.44	1.23	1.11	1.13	1.18	0.59
Company Name	DLG					WKF				
Year	Y5	Y4	Y3	Y2	Y1	Y5	Y4	Y3	Y2	Y1
Working capital ratio	-0.06	-0.46	0.00	-0.38	0.65	0.34	0.81	0.81	0.53	0.60
Retained earnings to Total assets	0.40	-0.53	-0.26	0.07	0.22	0.05	0.03	0.04	0.07	0.07
Return on Assets	0.54	-0.44	-0.18	0.14	0.34	0.10	0.10	0.13	0.16	0.15
Total equity to Total liabilities	1.01	0.03	0.98	0.12	2.59	0.54	0.49	0.42	0.39	1.07

ANNEXURE 6
FINANCIAL STATEMENTS

CONSUMER GOODS												
	ALC						MTA					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	26062.4	8046	-783	4728	12311	8802	1601426.2	434277	387885	377254	343612	291991
Total Long Term Loan Capital	60587.4	25829	2070	18584	13987	587	116850.4	39256	19616	23330	31583	15327
Total Inventory	36410.8	5574	8713	10153	10787	5919	679945.4	197178	157772	162747	131079	155847
Debtors	44594.2	7832	10098	12627	12159	9391	550184	180383	137090	113191	95026	122470
Total Current Assets	87179.2	13730	18842	22812	28733	15311	1473288.4	433050	333076	328673	322826	278317
Total Current Liabilities	68413.8	3869	31935	14552	15090	14839	570473	166221	132098	119091	123001	150310
Total Assets	155063.6	37744	33222	37864	41388	24228	2288749.6	639754	539599	519675	498196	457628
Statement of Comprehensive Income												
Turnover	222092.8	42273	53788	61312	55016	48519	3737636.4	1085882	857313	787449	829586	887032
Trading Profit	26851	8831	3283	4039	8905	8965	476471	159278	88911	88977	117661	108220
Profit Before Interest and Tax	17564.4	11020	-1380	-518	7163	6397	377882.8	131211	54557	71898	104961	76279
Total Interest Paid	11602.4	2431	3898	3407	1661	1027	30054	6884	5903	6905	7817	12725
Profit Before Taxation	5962	8589	-5278	-3925	5502	5370	347828.8	124327	48654	64993	97144	63554
Taxation	1782.2	0	0	0	1405	1886	102044	35409	18216	21467	23042	19550
Profit After Taxation	4179.8	8589	-5278	-3925	4097	3484	245784.8	88918	30438	43526	74102	44004
EBIAT	15782.2	11020	-1380	-518	5758	4511	275838.8	95802	36341	50431	81919	56729
Statement of Cash Flow												
Operating Profit/Loss	1354.8	-2085	-2085	-1547	5840	6159	281614.6	106537	44211	49373	67486	70038
Cash from Operating Activities	-620.2	-794	-793	6899	-6102	849	132629.4	32170	28819	-7293	71531	37012

	WES						CFR					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	5198523.4	119760	1209222	1931948	1625002	1562957	245859464	51839031.2	86671452	62483630.5	43758950.4	5532000
Total Long Term Loan Capital	0	0	0	0	0	0	12850107.3	2391796	4538107	3558028.3	2309376	264000
Total Inventory	0	0	0	0	0	0	86327406.4	30602400.4	26538338.4	16791566.8	12090700.8	1522000
Debtors	989	66	12	287	552	360	22899205.4	6961385.2	6800768.8	5215856.2	3814195.2	535000
Total Current Assets	1454663	121406	79067	883198	300590	352010	203352179	65875097.2	64300502	42725424.3	29701555.2	3748000
Total Current Liabilities	259499.4	1646	27074	118169	102354	51282	94482992.7	30363220.8	27100808	21202746.3	15502617.6	1568000
Total Assets	5458022.8	121406	1236296	2050117	1727356	1614239	353192564	84594048	118310367	87244405.1	61570944	7364000
Statement of Comprehensive Income												
Turnover	0	0	0	0	0	0	197069800	67475438	53509014	43570331	31771616	3717000
Trading Profit	-9809	-1106	-6354	-30	-1975	-1720	56442052	18625061	16198032	12609851	8827907	906000
Profit Before Interest and Tax	1375842	1002027	166138	179158	11236	86413	51070280	16063804	15653052	11589871	7633153	652000
Total Interest Paid	0	0	0	0	0	0	1316307.7	472464.8	363320.4	306896.9	169625.6	20000
Profit Before Taxation	1375842	1002027	166138	179158	11236	86413	49753972	15591339	15289731	11282974	7463527	632000
Taxation	462167	274868	97869	79186	9316	4640	6507077.8	1889859	2058815	1299799	1239005	98000
Profit After Taxation	913674.6	727159	68269	99972	1920	81773	43246894	13701480	13230916	9983175	6224523	534000
EBIAT	913674.6	727159	68269	99972	1920	81773	44563201.9	14173944.9	13594236.5	10290072.1	6394148.41	554000
Statement of Cash Flow												
Operating Profit/Loss	-20428.8	-2851	-8529	-4733	-3703	-3064	35697627.6	11625121.5	10556474.7	8096661.96	5324769.49	473000
Cash from Operating Activities	-3012139	-2074564	-800752	21672	-162021	17629	16710084.5	4712215.02	4662611.18	4404872.95	2839385.4	455000

	PAL						SHF					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	83050.2	13470	18952	23377	22034	26086	24860719	6546673	5119165	6477279	5823534	4470339
Total Long Term Loan Capital	2729.6	369	668	1136	368	943	26253887	7900425	8982256	5773051	3268799	1646779
Total Inventory	46240	11333	12331	9872	10280	12120	11206947	3451445	3290565	2937671	1348515	893754
Debtors	51401	15198	11177	9780	11221	20125	21624432	6204864	5913665	5522968	3488997	2469690
Total Current Assets	107671.2	26547	23848	23970	24642	43321	53128009	15030591	14469969	13717718	8762984	5733736
Total Current Liabilities	46049	18535	10547	5525	7135	21535	33899916	12072618	9501865	7896533	3829057	2999216
Total Assets	131828.8	32374	30167	30038	29537	48564	85014522	26519716	23603286	20146863	12921390	9116334
Statement of Comprehensive Income												
Turnover	278324.6	67211	64363	64630	65614	82533	100564267	36649727	32238322	19114369	10572130	9948595
Trading Profit	20583.8	1427	3561	6801	5504	16454	14980940.8	4962310	4749814	2922584	2021560	1623364
Profit Before Interest and Tax	-3846.8	-4527	-1515	1605	-3078	18341	11179024	4368927	3057133	2553300	1053036	733140
Total Interest Paid	2113.6	954	422	262	365	553	2398439.4	1034129	670249	385888	268694	197397
Profit Before Taxation	-5960.4	-5481	-1937	1343	-3443	17788	8780584.6	3334798	2386884	2167412	784342	535743
Taxation	2014.2	1	312	1	625	5376	1323544.4	651761	306262	222747	128047	73637
Profit After Taxation	-7974.6	-5482	-2249	1342	-4068	12412	7457040.2	2683037	2080622	1944665	656295	462106
EBIAT	-5861	-4528	-1827	1604	-3703	12965	9855479.6	3717166	2750871	2330553	924989	659503
Statement of Cash Flow												
Operating Profit/Loss	-4785.6	-4545	-1798	1525	-3359	16957	8974795.4	3038784	2674090	1938298	1127927	978482
Cash from Operating Activities	-8061.2	-5993	-4321	3710	-3691	11169	7406618.6	2576361	2656449	744179	1291265	691823

	TIW						SER					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	3843139.6	1215804	957340	808755	714451	733948	5535208	1493531	1400585	1241842	1183527	3843139.6
Total Long Term Loan Capital	1631682.4	711390	282667	321291	259744	282952	1656423.2	330506	294471	461554	463310	1631682.4
Total Inventory	1881377.2	507261	455155	404781	424565	448076	3061050.2	736921	669256	716867	788868	1881377.2
Debtors	2108420.6	588663	420246	483340	494851	606603	3079183	703923	709788	730956	776368	2108420.6
Total Current Assets	4675781.8	1258019	1076938	1129255	988863	1113534	6874290.4	1622714	1570726	1659972	1689345	4675781.8
Total Current Liabilities	3794184.4	1084519	918067	812649	806880	860347	3549778.8	849075	794158	799653	919104	3794184.4
Total Assets	9269006.4	3011713	2158074	1942695	1781075	1877247	10741410	2673112	2489214	2503049	2565941	9269006.4
Statement of Comprehensive Income												
Turnover	13042096	3299295	3102644	3181580	2952523	2530268	15968935	3686322	3745145	3793586	4031047	13042096
Trading Profit	1658326	344102	379318	421768	451679	307293	1379918	257593	275668	339377	431898	1658326
Profit Before Interest and Tax	792953.8	137520	275953	219699	106231	267754	1009687	168698	419005	192922	184922	792953.8
Total Interest Paid	169868.4	39815	35747	31998	53488	44102	352452.6	61991	68206	96363	102859	169868.4
Profit Before Taxation	623085.4	97705	240206	187701	52743	223652	657234	106707	350799	96559	82063	623085.4
Taxation	146832.6	35532	42435	43894	22869	10513	45816.6	10384	23542	5394	5175	146832.6
Profit After Taxation	476252.8	62173	197771	143807	29874	213139	611417.4	96323	327257	91165	76888	476252.8
EBIAT	646121.2	101988	233518	175805	83362	257241	963870	158314	395463	187528	179747	646121.2
Statement of Cash Flow												
Operating Profit/Loss	785179.6	112737	208457	228820	209929	126183	572517.4	114054	84003	140716	187786	785179.6
Cash from Operating Activities	1118090.8	190615	258310	269565	381995	88029	626477.6	116817	130506	235184	111142	1118090.8

CONSUMER SERVICES												
	RAG						SHP					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	1403851.6	164575	219840	469227	466731	417393	5432038.6	1462251	1641397	1122363	1081863	620823
Total Long Term Loan Capital	693040.4	346370	146370	148770	0	257652	549142.8	313365	16408	64059	121151	170799
Total Inventory	728006.8	143662	189787	210739	154429	146949	8590362.4	2160958	2108873	2083302	2052036	925967
Debtors	2795806.4	525953	639707	798273	715407	582332	4977141	1200518	1118138	1265478	1336190	284085
Total Current Assets	3692918	696657	858289	1018399	968699	754370	15712097	4323296	3763905	3879544	3432169	1565916
Total Current Liabilities	2392982	416748	727353	635717	576502	183310	15628223	4282290	3483299	3967523	3557177	1689670
Total Assets	4489874	927693	1093563	1253714	1043233	858355	21609404	6057906	5141104	5153945	4760191	2481292
Statement of Comprehensive Income												
Turnover	4917324.6	1153361	1230771	1224449	1133839	874523	71376333.6	19472470	18308521	17245920	14476324	9365493
Trading Profit	81343.4	-106410	-6043	60605	100611	162902	4377934.4	1440723	1125951	875689	832327	516222
Profit Before Interest and Tax	-5594.6	-164916	-156776	131951	157142	135022	1373796.8	304571	336037	262754	402216	341094
Total Interest Paid	318069.4	84078	80214	100768	46011	34992	248085.2	24877	65066	102515	46485	45711
Profit Before Taxation	-323664	-248994	-236990	31183	111131	100030	1125711.6	279694	270971	160239	355731	295383
Taxation	70580.4	5305	20231	10950	28468	28132	132031.2	34420	28463	19683	31822	88216
Profit After Taxation	-394244.4	-254299	-257221	20233	82663	71898	993680.4	245274	242508	140556	323909	207167
EBIAT	-76175	-170221	-177007	121001	128674	106890	1241765.6	270151	307574	243071	370394	252878
Statement of Cash Flow												
Operating Profit/Loss	-11983.6	-169408	-157805	131083	157142	135022	951025.8	223281	325801	122731	241459	188769
Cash from Operating Activities	-862123.6	-58912	123	-182412	-601004	-99593	2013371.2	919231	688601	460373	-51213	-18104

	TRX						WHL					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	280169.2	26716	27470	106438	100329	96081	9624414.6	2419493	2549415	2389100	1927103	1696518
Total Long Term Loan Capital	54998.2	6498	7745	9836	23656	36316	149587.6	111300	500	11100	21527	25803
Total Inventory	3896	1280	768	796	895	785	2101804.4	511200	503900	485500	504846	481792
Debtors	36030	1020	923	16008	7745	51670	5740470	1695800	1475900	1242200	1109016	1087770
Total Current Assets	84354.4	2563	8207	21649	39373	62812	9025160.2	2527000	2272200	2036700	1834469	1773956
Total Current Liabilities	54282	17020	11225	10358	8822	34285	5039082	1496507	1210985	1092200	1014362	1125140
Total Assets	389449.4	50234	46440	126632	132807	166682	14813084	4027300	3760900	3492400	2962992	2847461
Statement of Comprehensive Income												
Turnover	187384.6	42365	43076	45702	42236	70028	28919402	8616500	7026600	6359400	5904510	5061960
Trading Profit	33596.2	7683	5064	11000	7399	12251	3449678.8	973800	786300	769300	740635	898219
Profit Before Interest and Tax	-53685.2	-679	-78889	6180	6138	67824	2101499	599700	491500	406000	457486	734065
Total Interest Paid	641.4	75	79	15	70	2012	231950.2	45200	37000	47700	85384	83331
Profit Before Taxation	-54326.6	-754	-78968	6165	6068	65812	1869548.8	554500	454500	358300	372102	650734
Taxation	237	0	0	56	120	305	668005.8	226500	184500	109200	113452	171769
Profit After Taxation	-54563.6	-754	-78968	6109	5948	65507	1201543	328000	270000	249100	258650	478965
EBIAT	-53685.2	-679	-78889	6180	6138	67824	2101499	599700	491500	406000	457486	734065
Statement of Cash Flow												
Operating Profit/Loss	3724.4	89	-2969	3485	2280	4197	851439.2	312400	175800	131000	177102	275686
Cash from Operating Activities	63640	7024	16475	1273	46131	-36315	1285351.4	199700	342400	384800	332501	129752

INDUSTRIAL												
	NEI						HWN					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	762201.2	209020	194255	144107	181106	168566	494843.4	114753	115565	123175	127011	71697
Total Long Term Loan Capital	937	937	0	0	0	0	1268.2	0	260	323	571	571
Total Inventory	374211.6	98949	94478	77467	86518	83998	248283.8	52405	52653	66951	65173	55509
Debtors	389796.4	114959	72926	94222	91512	80887	358390.2	81842	77288	90887	87851	102611
Total Current Assets	935063	235285	194627	203594	258395	215810	769713.8	165130	179994	193911	196063	173079
Total Current Liabilities	528572.2	130470	99473	127747	147490	116961	437891.6	93558	103808	108985	107468	120363
Total Assets	1291710.4	340427	293728	271854	328596	285527	934003.2	208311	219633	232483	235050	192631
Statement of Comprehensive Income												
Turnover	2364135.8	555809	526103	564814	603821	567944	1597544	336440	370598	409168	422239.8	295491
Trading Profit	162988.8	37468	46969	38402	32874	36379	146664.2	21138	24498	40186	52507.8	41672
Profit Before Interest and Tax	110001	25078	29797	32300	16081	33725	159886	31240	26094	42523	52677.6	36757
Total Interest Paid	2204.6	1575	32	391	115	458	57682.2	21623	15024	10615	9442.8	4887
Profit Before Taxation	107796.4	23503	29765	31909	15966	33267	102203.8	9617	11070	31908	43234.8	31870
Taxation	23979	4798	6047	11280	1672	910	39682.8	5003	7611	12037	13825.8	6030
Profit After Taxation	83817.4	18705	23718	20629	14294	32357	62521	4614	3459	19871	29409	25840
EBIAT	86022	20280	23750	21020	14409	32815	120203.2	26237	18483	30486	38851.8	30727
Statement of Cash Flow												
Operating Profit/Loss	86627.2	17720	24894	26276	12354	26916	80968.8	7282	5029	25842	36370.2	32228
Cash from Operating Activities	70556.6	306	1215	1112	61840	30418	27464.4	-15089	20958	1645	18695.4	6275

	DLG						WKF					
	Average	Y5	Y4	Y3	Y2	Y1	Average	Y5	Y4	Y3	Y2	Y1
Statement of Financial Position												
Total Owners Interest	207561.8	73579	5593	99170	19749	47354	445923	115888	106916	94905	99084	145650
Total Long Term Loan Capital	48883	13647	17210	9198	8828	0	501503.4	10129	168406	181805	129761	57012
Total Inventory	2494	0	1136	1358	0	0	4407	1271	1345	874	917	0
Debtors	148277.4	11792	38065	41548	53657	16077	1029570.8	241685	216127	269487	260104	210839
Total Current Assets	307632.2	50172	71377	92179	81704	61001	1297164.6	320525	314968	306713	305399	247798
Total Current Liabilities	455265.6	59131	150127	92374	149975	18293	440579.6	206346	51580	45503	121331	79098
Total Assets	711710.4	146357	172930	200742	178552	65647	1388006	332363	326902	322213	350176	281760
Statement of Comprehensive Income												
Turnover	1253110	283888	343988	370337	230646	121255	4426923.4	1128773	1018921	1138152	968980	860487
Trading Profit	201670	44412	60295	46867	43549	32735	238266.4	34453	58210	65955	69635	50067
Profit Before Interest and Tax	-5645.2	78631	-76378	-37126	24795	22164	170729.6	32875	31070	40680	57565	42698
Total Interest Paid	12504.4	2694	3632	5125	1050	17	70152.6	12721	15431	25272	14581	10738
Profit Before Taxation	-18149.6	75937	-80010	-42251	23745	22147	100577	20154	15639	15408	42984	31960
Taxation	28094.8	9329	7019	5002	5472	6364	20777.8	4506	4129	3767	6840	7679
Profit After Taxation	-46244.4	66608	-87029	-47253	18273	15783	79799.2	15648	11510	11641	36144	24281
EBIAT	-33740	69302	-83397	-42128	19323	15800	149951.8	28369	26941	36913	50725	35019
Statement of Cash Flow												
Operating Profit/Loss	-152000.8	-32069	-86288	-58140	20520	19881	147906	29032	28747	36797	48589	23705
Cash from Operating Activities	49417.2	33385	-1052	5712	8258	15571	32209.4	-949	44751	-9005	2571	-25793