Assessing the relationship between integrated reporting and financial indicators of selected JSE companies

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ABSTRACT

Title: Assessing the relationship between integrated reporting and financial indicators of selected JSE companies

Keywords: integrated reporting, financial capital, financial performance, value add, the International Integrated Reporting Framework, financial ratios, EY's 'Excellence in Integrated Reporting Awards'

The increasingly popular integrated report (IR) is becoming the norm of best practice for companies that are viewed as successful. An IR communicates the value-creation plans of a company for the future, while providing, in an integrated manner, any non-financial information. The International Integrated Reporting Council considers integrated reporting (IRG) necessary to answer to the corporative demands of the 21st century.

Typically IRG seeks to create value in companies' six capitals (financial, manufactured, intellectual, human, social and relationship, and natural), according to the International Integrated Reporting Framework. However, the present study focused on the *financial* capital. The reason is that financial indicators are crucial to various stakeholders, including investors, credit providers, employees and governments, to assess the financial health of a company. As the issuing of an IR is resource intensive, it is important to determine whether investing these resources add value to an orginasation. To date, limited research has been conducted on the relationship between IRG quality and financial indicators. Previous studies have not included the same financial indicators as this study. This study therefore strived to answer the research question: 'How does IRG affect financial indicators of a company?'

All JSE listed companies were designated as the population for the research. The sample focused on the top 100 JSE-listed companies, eliminating the industrial metals and mining companies within the industries of basic materials industry and finances. The focus was on the relationship between the ratios selected as financial indicators, and the quality of an IR (determined by EY's 'Excellence in Integrated Reporting Awards'). This relationship was analysed empirically for the period 2014 – 2017. The data were analysed using three statistical methods, descriptive statistics, Spearman's rank-order correlation and the repeated measures analysis of variance (ANOVA).

This study delivered various findings. Regarding the descriptive statistics, it was observed that quality IRs may improve the earnings yield, net operating profit after tax, earnings before interest, taxes, depreciation, and amortisation (EBITDA) as well as gross profit % ratio. Other financial indicators weakened as the quality of IRG increased, these indicators were:

inventory, average debtors collection period and dividend cover. By applying Spearman's rank-order correlation technique, evidence was found that quality IRs may improve certain ratios, namely EBITDA, dividend yield, gross profit %, net profit %, EBITDA margin, net operating profit after tax, return on capital employed, return on equity and market capitalisation. Findings also showed that as the quality of IRG improved, the ratio of dividend cover deteriorated.

The significant findings from the repeated measures ANOVA of the fixed-asset turnover indicated that the worst IRG rating emerged with the highest fixed-asset turnover ratios. For total asset turnover, the best quality IR was related to the lowest ratio. The earnings yield ratio indicated that different ratings provided the highest ratio figure over the four-year period of the research. The best quality IR provided the highest average debt to equity figures, which are not preferable, whereas the lowest quality delivered the best debt to equity ratio. Such inconsistent results made it challenging to conclude on the effect of the quality of IRG on the ratio figures.

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LIST OF ABBREVIATIONS USED

ANOVA	:	Analysis of variance
CEOs	:	Chief Executive Officers
CFOs	:	Chief Financial Officers
CFS	:	Cash flow statement
CoC	:	Cost of capital
CSR	:	Corporate social responsibility
DF	:	Degrees of freedom
EBIAT	:	Earnings before interest and taxation
EBIT	:	Earnings before interest and tax
EBITDA	:	Earnings before interest, taxes, depreciation, and amortisation
EIRAs	:	Excellence in Integrated Reporting Awards
EPS	:	Earnings per share
ESG	:	Environmental, social and governance
EVA	:	Economic value added
F	:	Test statistics
FCF	:	Future cash flows
FY	:	Fiscal year
GDP	:	Gross domestic product
ICB	:	Industry Classification Benchmark
IFAC	:	International Federation of Accountants
IFRS	:	International Financial Reporting Standards
IIRC	:	International Integrated Reporting Committee
IIRF	:	International Integrated Reporting Framework
IoDSA	:	The Institute of Directors in Southern Africa
IR	:	Integrated report
IRESS	:	IRESS Limited
IRG	:	Integrated reporting
JSE	:	Johannesburg Stock Exchange
MS	:	Mean squares
MSm	:	Mean squares of the model
MSr	:	Mean squares of the residual
NOPAT	:	Net operating profit after tax
P	:	p-value
ROA	:	Return on assets
ROCE	:	Return on capital employed

ROE	:	Return on equity
ROIC	:	Return on invested capital
SAICA	:	The South African Institute of Chartered Accountants
SoCE	:	Statement of changes in equity
SoCI	:	Statement of profit or loss and other comprehensive income
SoFP	:	Statement of financial position
SOX	:	Sarbanes-Oxley Act of 2002
SS	:	Sum of squares
TA	:	Total assets
UCT	:	University of Cape Town
UK	:	United Kingdom
UN	:	United Nations
USA	:	United States of America
WACC	:	Weighted average cost of capital
WBCSD	:	World Business Council for Sustainable Development
WFE	:	World Federation of Exchanges

LIST OF FORMULAS USED

Formula #		Formula
1	:	Inventory turnover = Cost of sales/Average inventory balance
2	:	Average debtors collection period = Average debtors balance/Credit sales per day
3	:	Fixed-asset turnover = Sales/Net fixed assets
4	:	Total asset turnover = Sales/Total assets
5	:	Times interest earned (interest cover) = EBIT/Interest
6	:	EBITDA = Earnings before interest, taxes, depreciation, and amortisation
7	:	Fixed charge coverage = (EBIT + lease payments)/(lease payments + interest)
8	:	Dividend yield = Dividend per share/Market price per share
9	:	Earnings yield = Earnings per share/Market price per share
10	:	Price-earnings ratio = Market price per share/Earnings per share
11	:	Dividend cover = Net earnings/Dividend
12	:	Gross profit percentage = Sales minus cost of goods sold/Sales
13	:	Net profit percentage = Net income/Sales
14	:	EBITDA margin = Operating income (EBIT) after depreciation and amortisation/ Total revenue
15	:	Net operating profit after tax = EBIT(1 − Tax rate)
16	:	Return on capital employed = NOPAT/Net operating assets
17	:	Return on invested capital = NOPAT/Operating capital
18	:	Return on equity = Net income/Total Equity
19	:	Debt ratio = Total debt: Total assets
20	:	Debt to equity = Total debt/Total equity
21	:	Market capitalisation = Price per share (quoted on Securities Exchange) * Number of group shares in issue

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CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

"… the integrated report serves as a business card for the company both internally and externally" (Eccles & Saltzman, 2011:60).

1.1 INTRODUCTION

Research has shown that South Africa laid the benchmarks for integrated reporting (IRG), being the first country in the world that implemented this form of reporting (EY, 2012). In 2010, the Johannesburg Stock Exchange (JSE) became the first globally that instructed companies to apply IRG or to explain why they failed to do so (JSE, 2017).

The Reporting Financial Council in the United Kingdom (UK) already in 2009 highlighted the concern that reporting practices are becoming overly complex and less relevant (Financial Reporting Council, 2009:1). In 2011, the Council presented another discussion paper stating that current reporting practices should be restructured to be simplified and clearer to its stakeholders (Financial Reporting Council, 2011:2). Eccles and Saltzman (2011:58) argue that the increasing complexity of financial reporting makes it challenging for "all but the most sophisticated users to understand the reports". De Villiers, Rinaldi and Unerman (2014:1042-1043) posit that previous stand-alone reports became too complex, seeing that companies were attempting to meet the continually demanding needs of the relevant stakeholders. Rensburg and Botha (2014:144) concur and add that international company reporting practices are undergoing drastic changes as the demands of stakeholders are mounting while company resources are decreasing over time. From these interpretations, it can be argued that traditional reporting practices apparently were not fulfilling stakeholders' needs.

Steyn and De Beer (2012:54) stressed that "the collapse of the financial system and the global economic crisis of 2009 were a wake-up call to the world". During the past decade, over 61 032 companies failed internationally, and during 1980 to 2013, more than 2 400 companies in South Africa alone went under (Cassim, 2014:1). Due to the mentioned collapses, stakeholders tend to query the importance and trustworthiness of annual financial reports (Integrated Reporting Committee of South Africa, 2011:1). Stakeholders currently seek "forward-looking information" to evaluate the total economic worth of a company (Integrated Reporting Committee of South Africa, 2011). Stakeholders and investors are becoming more concerned with the holistic performance of a company, thus including a company's influence on the environment (Perego, Kennedy & Whiteman, 2016:1). The integrated report (IR) was therefore introduced to address these concerns.

1.1.1 Integrated reporting

The International Integrated Reporting Committee (IIRC) (2011:6) explains the process as follows: “Integrated reporting brings together the material information about an organisation’s strategy, governance, performance and prospects in a way that reflects the commercial, social and environmental context within which it operates.” The IIRC changed its name to the International Integrated Reporting Council during November 2011 (Hurks, Langendijk & Nandram, 2016:519). Previously a company would have compiled an annual report and other forms such as a sustainability report, whereas IRG integrates all reports into a single, overarching one (De Villiers *et al.*, 2014:1043). IRG combines sufficient material information to offer a concise demonstration of how the company displays leadership and creates value (IIRC, 2011:2).

The King reports focus on corporate governance in South Africa, aiming to be at forefront of governance in a global sense (The Institute of Directors in Southern Africa (IoDSA), 2009:4). The third King report, King III, was introduced on 1 March 2010 (IoDSA, 2009:17). King III pointed out the significance of annual company reporting in an integrated manner to ensure financial results are viewed in perspective with the impact of a company on its surrounding community’s economic life (IoDSA, 2009:4). King III describes IRG as a “holistic and integrated representation of the company’s performance in terms of both its finance and its sustainability” (IoDSA, 2009:55).

King IV, introduced in 2017 to replace King III, defines IRG as follows: “A process founded on integrated thinking that results in a periodic IR by an organisation about value creation over time. It includes related communications regarding aspects of value creation” (IoDSA, 2016:13). As the updated definition in King IV indicates, the IR explains how an entity adds value in the various aspects of its enterprise. The International Integrated Reporting Framework (IIRF), which was developed by the IIRC and issued in December 2013, also emphasises that the most important objective of IRG should be to explicate how a company creates value to all stakeholders (IIRC, 2013:1 & 4).

1.1.2 International Integrated Reporting Framework

The IIRF was issued to guide companies on the strategy to prepare and present a sound IR (IIRC, 2013:7). The IIRF emphasised that IRG communicates the various factors, which have a substantial effect on an entity’s ability to add value over the short, medium and long term (IIRC, 2013:4).

The IIRF lists six capitals: financial, manufactured, intellectual, human, social and relationship, and natural. These capitals can be viewed as “resources and relationships used and affected

by an organisation" (IIRC, 2013:4). Companies do not have to use this categorisation when reporting; they rather use it as a 'checklist' to ensure they have considered the necessary capitals (IIRC, 2013:11-12). The IR should explain how the capitals and external environment can be considered to add value, presently and in the future (IIRC, 2013:4). One of the fundamental concepts of the IIRF is to create value through the capitals for the organisation and stakeholders (IIRC, 2013:3). The release of the IIRF helped develop company reporting (Simnett & Huggins, 2015:29). The reason is that IRs will explain the link between the six capitals, which is explicated in the IIRF as "interdependencies between financial and non-financial aspects of a company's strategy" (Simnett & Huggins, 2015:29).

1.1.3 Financial indicators

The financial capital can be defined as: "The pool of funds that is available to an organisation for use in the production of goods or the provision of services obtained through financing, such as debt, equity or grants, or generated" (IIRC, 2013:11). This definition makes it clear that funds not only refer to available cash reserves, but include other forms acquired through financing (e.g. loans or shares), or funds which the company generated (e.g. profits). In short, funds entail financing that is applied to provide services and produce goods. The focus on financial indicators is due to the importance of companies' financial performance, which impact stakeholders such as analysts of securities, management of companies, and investors (Chan, Chan, Jegadeesh & Lakonishok, 2001:1).

Investors and market analysts in particular, focus on financial indicators to assess share investments (Menaje & Placido, 2012:98). It is commonly understood that earnings are the "bottom line", the best evidence provided in financial statements (Lev, 1989:155). Roberts and Dowling (2002:1077) explain this relationship: "Existing empirical research confirms that there is a positive relationship between reputation and financial performance." Financial indicators are therefore of utmost importance for decision-making by the relevant stakeholders.

1.1.4 Scope of the research

The present study investigated how IRG adds value, specifically to one of the six capitals described in the IIRF: the financial capital.

From the interpretations in par. 1.1.3 above, it can be argued that financial indicators of a company is crucial to stakeholders. The latter are not satisfied with only an explanation of companies' value creation, but demand that enterprises begin measuring their value-adding activities (PWC, 2013:5). The effect of IRG on financial indicators of companies was therefore considered by examining how selected indicators – ratios related to financial performance, growth and risk – improved or weakened after a company have implemented IRG.

1.2 MOTIVATION OF TOPIC ACTUALITY

The South African Institute of Chartered Accountants (2015) (SAICA) explains, “First there was financial reporting, then came sustainability reporting, and now it’s the turn of integrated reporting.” The IIRC concurred when it confirmed its plans for IRG to move into its Global Adoption Phase in 2018, to become the heart of corporate governance and reporting (Chen, 2017). Since IRG is a fairly new field of study, there is still a gap in research on this topic, especially the development in the practice of IRG (Lodhia, 2015:586). Academics are becoming increasingly interested in IRG and a growing number of research papers on this instrument are published in journals and presented at conferences (Dumay, Bernardi, Guthrie & Demartini, 2016:166). As IRG in practise progresses, academics have a vital role to play by providing evidence that help improve policies and practices in this field (De Villiers *et al.*, 2014:1062).

Previous studies have investigated the trends in IRG of JSE-listed companies (Mashile, 2015:3). The focus was on the mentioned companies’ compliance to requirements of King III or the global reporting initiative framework (Hindley, 2012:2). Studies investigated how companies are implementing the new method of reporting (Lodhia, 2015:585) and suggested a template for IRG (Abeysekera, 2013:227). Roberts (2017) outlines the implementation of IRG by companies in South Africa.

However, limited research was done on the ‘value-add’ emphasis of the IIRF. Haller and Van Staden (2014:1190) conducted a study to investigate whether a value-added statement can be a suitable instrument for IRG. Gokten and Gokten (2017:1) examined the value-add idea, as the most theoretical philosophical component of the IIRF, and its relevance to all stakeholders at present and in future.

On the other hand, there is a paucity of empirical evidence on the benefits of IRG (Barth, Cahan, Chen & Venter 2016:3; Zhou, Simnett & Green, 2017). The reason is that IRG is a new research area covered by limited empirical research studies (Velte & Stawinoga, 2017:280). Previous studies provided initial evidence on the impact of IRG on certain financial indicators such as stock liquidity, firm value, cost of capital, return on investments, and size (Baboukardos & Rimmel, 2016; Barth et al., 2016:9; Bernardi & Stark, 2018; Churet & Eccles, 2014; Lee & Yeo, 2016; Zhou et al., 2017). Nevertheless, these prior studies only investigated the impact of IRG on limited financial indicators and only until the period 2015.

Churet and Eccles (2014:8) point out a time lag between the implementation of IRG and gaining the benefits from it. Most entities that provide an IR have only been doing so for a few years since IRG is a novel management practice (Churet & Eccles, 2014:8). In a published strategy for IRG, ‘The Breakthrough Phase 2014-17’, the IIRC asserted that during this period

the focus will be on the development and early adoption of IRG by companies worldwide (IIRC, 2014:2). The IIRC thus strives to be “market-led and evidence based” (IIRC, 2014:2).

The present study complements previous emperically-evidenced literature, thereby supporting the intention of the IIRC by providing empirical evidence of the financial indicators used by companies that implemented IRG during this phase, for the period until 2017. Few previous studies explored correlations between the ratios and IRG, and even less researchers considered the relationship between the ratios and the IRG strength, as the present study did. In addition, this study expands existing academic literature on IRG’s impact on financial indicators by including growth and risk ratios. In this regard, the study responds to pleas for more in-depth research on the relationship between IRG and the capital markets (Arguelles, Balatbat & Green, 2015:25; Baboukardos & Rimmel, 2016:25).

It is vital to determine whether the cost of IRG exceeds the obtained benefits obtained, seeing that, at the date of this study, such an outcome has not been established as yet (Serafeim, 2015:27). Chaidali and Jones (2017:9) interviewed certain senior management representatives as well as members of the design consultancy profession who helped adopt and implement the IR. Most preparers indicated that IRG places a strain on resources in terms of preparation and other costs incurred (Chaidali & Jones, 2017:14). Chaidali and Jones (2017:14) explained: “The report will become longer and then it seems to me that the cost of the IR will be a crucial burden for them [companies].”

The Global Reporting Initiative (2014:1) explains that the internal costs for issuing a sustainability report includes internal resources. These entail time spent by senior personnel and others to familiarise themselves with the content of the report, staff training, gathering and reviewing of data, and preparing the report. External resources may include consultants to assist with the writing, reviewing, design and printing of the report itself as well as external verification and audit work (Global Reporting Initiative, 2014:1). The cost of sustainability reporting can differ from an immaterial amount to those exceeding €100 000 per company per year (Global Reporting Initiative, 2014:1). Similar to a sustainability report, the preparation of IRG can consume a considerable amount of resources, thus incurring material costs to the company.

Due to the importance of financial indicators discussed in par. 1.1.3 and the fact that companies devote extensive resources to develop their IR, it is essential to investigate whether IRG adds value to the financial capital according to the IIRF.

1.3 PROBLEM STATEMENT

A knowledge gap is evident, due to the mentioned deficiency in previous studies on the implementation of IRG. These studies have only explored the financial impact of limited financial indicators for companies after the implementation, and only for the period until 2015. Entities devote a great deal of resources, including time and costs, by developing the IR. In addition, the intention of IRG is to create value. These reasons make it necessary to determine whether resources allocated to IRG, do add financial value to stakeholders by improving the financial indicators, namely ratios of financial performance, growth and risk. The problem statement can therefore be specified as follows: *How does IRG affect the financial indicators of a company?*

1.4 OBJECTIVES OF THE STUDY

Various objectives have been formulated for the present study.

1.4.1 Primary objective

In an attempt to answer the research question, the main objective of the research is to determine the impact of IRG on companies' financial indicators.

1.4.2 Secondary objectives

To achieve the primary objective, the following secondary objectives were derived:

1.4.2.1 Theoretical objectives:

a. Determine the importance of IRG through a literature review.

b. Explain the importance of companies' financial performance, risk and growth as well as the ratios used to analyse these indicator categories.

c. Explain the requirements for EY's (formerly Ernst & Young) 'Excellence in Integrated Reporting Awards' ranking of companies' IRs, to be used as basis for further analysis of the financial indicators.

1.4.2.2 Empirical objective:

d. Determine the effect of IRG on financial indicators by analysing such indicators of JSE-listed companies.

1.5 RESEARCH DESIGN AND METHODOLOGY

The present study incorporated both a literature review and an empirical study. For purposes of this study, a mixed method approach was followed to cover both qualitative and quantitative research elements. IRs were examined of the top 100 JSE-listed companies, excluding

industrial metals and mining within the industry for basic materials as well as the financial industry (for reasons provided in par. 1.5.4).

JSE-listed companies were selected since they had to begin applying King III. This principle recommends that businesses should present an IR, or explain the reason for failing to do so, for the financial years beginning on and after 1 March 2010 (Integrated Reporting Committee of South Africa, 2017). King IV, which replaced King III in 2017, still recommends IRG (IoDSA, 2016:5). For the present study, the selected companies' financial statements were examined over four years. Companies are obliged to retain their financial records for seven years (South Africa, 2008:68). However, the IRs of companies for only the period 2014 – 2017 could be examined since the IIRF was issued in December 2013, which served as a guideline for the application of their IR.

EY's Excellence in Integrated Reporting Awards (EIRAs) for the rankings of companies' IRs were used as basis to analyse the financial indicators further. EY is one of the 'Big 4' accounting firms worldwide that provide a wide range of auditing and accounting services (Statista, 2017). EY was the winner of the Big 4 Firm of the Year for 2017 at the South African Professional Services Awards (SAPSA, 2018). Thus, EY is recognised as an expert in accounting and auditing. The purpose of EY's EIRAs is to "encourage excellence in the quality of integrated reporting to investors and other stakeholders in South Africa's listed company sector" (EY, 2017).

Subsequently, a quantitative approach was followed to determine the financial indicators of these companies for the selected period. This was done by examining the different ratios that would indicate the financial performance, growth and risk of these companies.

1.5.1 Literature review

The purpose of the extensive literature review was to determine the importance of IRG and financial indicators of companies, and the ratios used to analyse financial performance, growth and risk. Sources that were accessed are peer-reviewed journal articles that provide information on IRG and financial ratios, the IIRF, as well as King III and King IV. Further sources were the Internet and discussion papers by the IIRC of South Africa. Sources also included the EIRAs for the period 2014 – 2017. The review was done to explain the adjudication process used to obtain the rankings of companies' IRs, which will be used as basis for further analysis.

1.5.2 Empirical study

For the purpose of the present study, the financial indicators of the sampled companies were analysed by focusing on specific financial ratios. The ratios highlighted the companies'

financial performance, growth and risk to determine the impact of IRG on the financial capital. Various financial ratios were considered to assess the financial indicators of the sampled companies since few amounts in the financial statements have a meaning as such. It is only possible to form a perspective and gain an understanding when calculated numbers are considered relative to others (Gouws & Lucouw, 1999:107).

1.5.3 Target population

The main source for the present study was secondary data. All JSE-listed companies were selected as the target population since they are obliged to provide IRs, or explain if failing to do so. These companies also have high market capitalisations, almost flawless reputations and their data are easily available and accessible (Robbetze, 2015:12). Financial ratios were analysed for the years 2014 – 2017. The year 2017 was selected as the last entry, since not all the data of the financial ratios for 2018 were available at November 2018. Furthermore, 2014 was selected as the first year since the IIRF was only published in December 2013, as explained in par. 1.1.1. Thus it is evident that companies could only have used the framework to assist with their IRG from the year 2014 onward.

1.5.4 Sampling frame

The selected sample covers the top 100 JSE-listed companies according to the capitalisation of individual market shares. The system used by the JSE to classify companies is called the Industry Classification Benchmark (ICB), which has four levels (JSE, 2018b). The industry level consists of ten industries namely: 1) oil and gas; 2) basic materials; 3) industrials; 4) consumer goods; 5) health care; 6) consumer services; 7) telecommunications; 8) utilities; 9) financials; and 10) technology (JSE, 2018b). The financial sector and the industrial metals and mining companies within the sector for basic materials were not included in the selected sample. Rama (2013:7) argues that the profitability and asset structures of these two sectors differ from the other sectors by being more specialised. Furthermore, 54 companies were excluded due to the industry and sector in which they are listed. The sample for the present study therefore comprised 46 JSE-listed companies.

1.5.5 Sample method

Judgment sampling means the researcher depends on the use of individual sound judgment to select the population members who are applicable to the study (Dudovskiy, 2018). From the population of all JSE-listed companies, the top 100 were selected on the basis of their market capitalisation as at 31 December 2017, according to the EY's EIRAs for 2018. Judgment sampling was further applied by excluding the industrial metals and mining

companies within the basic materials as well as the financial industries, as explained previously.

1.5.6 Measuring instrument and data collection method

The study gathered data on the financial capital in the financial statements to compute financial ratios of selected JSE-listed companies. The data for the analysis of financial indicators were collected from IRESS Limited (IRESS). IRESS is a technology company similar to Reuter's and Bloomberg that offers several services and information such as "market data, trading solutions and wealth management systems" (Wykerd, 2018a). Financial indicators from 2014 – 2017 were examined. Microsoft (MS) Excel was used to categorise the gathered data.

1.5.7 Statistical analysis

The study was based on secondary data gathered and investigated regarding the financial indicators of the mentioned listed companies on the JSE. Secondary data were obtained directly from IRESS and processed by using Statistica Version 13.3 software package and MS Excel. The following statistical methods were used to process the empirical data sets:

a. Descriptive statistics – analysis of financial ratios taken over four years regarding rankings of companies according to EY's EIRAs.

b. Spearman's rank-order correlation technique – analyses the strength between the related ratios when considering EY's ranking of companies for the EIRAs.

c. Repeated measures analysis of variance (ANOVA) – analyse the relationship between the ratios for different EIRAs' rankings of companies over the period 2014 – 2017.

1.6 ETHICAL CONSIDERATIONS

Data were acquired from secondary sources considered as public information, which may imply minimal potential ethical issues to consider. The study did not conduct surveys or required assistance from research participants. Permission for the research was obtained from the Economic and Management Sciences Research Ethics Committee from North-West University. In this dissertation, the researcher presents the findings and judgements for the study objectively.

1.7 CHAPTER LAYOUT

This study is structured according to the following chapters:

Chapter 1: Introduction and background to the study

Chapter 1 presents the background of IRG, the IIRF and the financial capital. The focus is on the importance of IRG and financial indicators of a company. This is followed by motivating the topic and presenting the problem statement. The research objectives are described, followed by the research methodology with a justification. Finally a chapter overview is given of the study.

Chapter 2: Literature review

This chapter addresses the theoretical research objectives by providing an in-depth examination of IRG. The chapter also deal with the importance of a company's financial indicators as well as the financial ratios that must be analysed to achieve the theoretical objectives. The chapter concludes with a detailed explanation of EY's EIRAs.

Chapter 3: Research design and methodology

Chapter 3 explains the research question, research design and the methodology followed in the present study to accomplish the primary and secondary (i.e. theoretical and empirical) objectives. The chapter describes how statistical data were gathered, sorted and examined. Furthermore, the focus is on the type of research, the study's population, the sample and sampling method as well as the quality of the data, and basic ethical concerns.

Chapter 4: Results and findings

Chapter 4 provides a detailed analysis and discussion of the impact of IRG quality on financial indicators of a company, in order to identify the movement in the selected financial ratios. Empirical research analyses the secondary data: financial indicators of the selected 46 JSE-listed companies.

Chapter 5: Conclusions and recommendations

The questions that arise from the primary and secondary (theoretical and empirical) objectives are answered in Chapter 5. Limitations are pointed out that may have influenced this study and recommendations made for future research in this field.

CHAPTER 2

INTEGRATED REPORTING AND FINANCIAL INDICATORS

"The difference is that integrated reporting, unlike financial reporting, is not technical. It is the company telling its story" (Druckman, 2013).

2.1 INTRODUCTION

The history of accountancy evolved as reporting standards and practices have changed over the years due to worldwide events (King, 2012:1). The Great Depression during the 1930s resulted in the United States of America (USA) establishing generally accepted standards of accounting (King, 2012:1). The failure of the Bank of Credit, Commerce International and Maxwell, and the debate over directors' remuneration in the late 1980s was one of the reasons for the Cadbury Report on 'The Financial Aspects of Corporate Governance' (King, 2012:1; The Committee on the Financial Aspects of Corporate Governance, 1992). In response to the scandals surrouding Enron and WorldCom in 2001, the U.S. Congress passed the Sarbanes-Oxley Act of 2002 (SOX) that introduced "major changes to the regulation of financial practice and corporate governance" (Addison-Hewitt Associates B2B Consultancy, 2003; King, 2012:1). In 2008, a global financial crisis struck (Adebambo, Brockman & Yan, 2015; King, 2012:1). The mentioned events were the driving force behind the increasing importance of financial corporate reporting and governance that help make companies more accountable to the public (Maniora, 2017; Roxana-Ioana & Petru, 2017:424).

In addition to the global financial crisis, the world is facing further crises of climate change and ecological overshoot (IoDSA, 2016; King, 2012:1). There is growing evidence that sustainability is a serious and persistent matter that receives insufficient attention (Gray, 2006:809). According to Wright and Nyberg (2017:1633), climate change is the most profound issue that humankind is facing. Therefore, companies have three pressing issues to contend with: the worldwide crises of financial sustainability, climate change, and ecological overshoot. Companies have to consider these issues in their long-term planning (King, 2012:1).

David Cameron, British Prime Minister from 2010 – 2016, stated in November 2010, "It's time we admitted that there's more to life than money and it's time we focused not just on gross domestic product (GDP) but on GWB – general well-being." (Stratton, 2010). Stakeholders are becoming more concerned with the long-term sustainability of the company (Hurks *et al.*, 2016; Jennifer Ho & Taylor, 2007:123). De Villiers and Van Staden (2010:227) point out that in the world with its restricted resources, stakeholders require of companies to be transparent about

their impact on the environment. Mervelskemper and Streit (2017:546) conclude that integrated reporting (IRG) is better than stand-alone environmental, social and governance (ESG). The reason is that IRG reports any increase in market valuation of ESG performance. Henk de Bruin, Head of Corporate Sustainability for Philips explains: “We believe that customers will increasingly consider natural resources in their buying decisions and will give preference to companies that show responsible behaviour—something we are already seeing” (Green Builder, 2015). This view by De Bruin resonates with King III: “The formula is simple: No planet, no people, no profit” (King, 2012:1).

As explained in par. 1.1.1, traditional corporate reporting is inadequate to offer stakeholders the essential information on the companiy's environmental and financial engagement (Bhasin, 2017; Financial Reporting Council, 2009:3). Physical and financial assets represented 83% of the market value of companies in 1975, but merely 19% in 2009 (Dahms, 2012:16). This trend indicates a shift in business models that is unfortunately not mirrored in traditional statements (Dahms, 2012:16).

In response to the shortcomings of current reporting models, the integrated report (IR) was introduced (Integrated Reporting Committee of South Africa, 2011; King, 2012:2). It is necessary for all companies to produce an IR, in order to help create a sustainable society that takes care of resources for the future generations (Eccles & Saltzman, 2011:59).

Chapter 1 of the present study presented the background of IRG, the International Integrated Reporting Framework (IIRF) and the financial capital. The chapter introduced the importance of IRG and financial indicators of a company. The researcher also motivated the topic and presented the problem statement, research objectives and methodology.

The main purpose of chapter 2 is to address secondary objectives a, b and c, as explained in par. 1.4.2.1 above. This chapter commences with a study on the importance of IRG. Thereafter, the chapter investigates essential aspects such as financial performance, risk and growth of companies. Similar studies published on the topic is reviewed to establish the relevance of IRG and financial indicators. This chapter also identifies the ratios that are used to analyse financial performance, risk and growth. Finally, the requirements are explained for the different rankings of the EIRAs grading companies’ IRs. Figure 2.1 below indicates how each secondary objective of the study is linked to a main paragraph of this chapter.

Figure 2.1 Links between secondary objectives and main paragraphs

Par. 2.2: Importance of integrated reporting	→	Secondary objective a.
Par. 2.3: Essential financial indicators	→	Secondary objective b.
Par. 2.4: Document analysis on the impact of IRG on financial indicators	→	Secondary objective a. and b.
Par. 2.5: Analysis of financial ratios	→	Secondary objective b.
Par. 2.6: Explanation of EY's 'Excellence in Integrated Reporting Awards'	→	Secondary objective c.

Based on Figure 2.1 above, the importance of IRG will be investigated in the following paragraph.

2.2 THE IMPORTANCE OF INTEGRATED REPORTING

The Oxford English Dictionary (2018b) defines the word 'integrated' by using terms such as "unified, united, consolidated, amalgamated, joined, combined, or merged". The word 'reporting' is defined as: "Give a spoken or written account of something that one has observed, heard, done, or investigated" (Oxford English Dictionary, 2018c). From these definitions, it can be posited that IRG in the world of corporate reporting is the way a company will communicate by telling its story in a concise, unified manner, thereby covering all information in a single transfer.

To add value to the present study, it is important to evaluate why companies should be interested in preparing an IR. Therefore, it should be ascertained whether IRG adds value by providing an advantage to the company, the investor and other stakeholders.

2.2.1 The journey to integrated reporting

Before literature on IRG existed, companies began presenting an 'IR', referred to as 'One Report', "showing how practice often leads theory in new management ideas" (Eccles & Saltzman, 2011:58-59). John Elkington's concept in 1994 of the triple bottom line already launched the idea of IRG; this also applies to Robert G. Eccles and PricewaterhouseCoopers' Value Reporting in 1999 (Eccles & Saltzman, 2011:59). In a brief of Business for Social Responsibility in 2005, Allen White (Vice President of Tellus Institute and co-founder of the Global Reporting Initiative) discussed Novo Nordisk, a global healthcare company. White described Novo Nordisk's reporting as, "integrated, balanced, and candid", thus using the term 'integrated' for the first time in this context (Eccles & Saltzman, 2011:59; White, 2005).

The IRG journey began when South Africa became a democracy in 1994, and was re-admitted to the world economy (Richard, 2017:174). The World Business Council for Sustainable Development (2014:6) (WBCSD) pointed out that South African companies and institutions emerging from the apartheid regime were not trusted at that time. Richard (2017:174) and

West (2006:435) contributes to this view by explaining that to help restore corporate confidence, the IoDSA established the King Committee in 1994. The aim of this Committee was to set out a “code on corporate governance” while also providing regular updates and assistance. The King Committee was established as part of the growing international focus on corporate governance after the publication of the Cadbury Report, as explained in 2.1 (West, 2006; West, 2009:11). The first King report was issued in 1994 (IoDSA, 2018). This report encouraged companies to disclose non-financial information in a balanced approach which involve all relevant stakeholders (WBCSD, 2014:6). A revised report, King II, was published in 2002, urging companies to expand their responsibilities by including reporting on social and environmental aspects (JSE, 2017; WBCSD, 2014:6).

The International Financial Reporting Standards (IFRS) were released in 2001 with the main purpose of standardising financial reporting with the benefit of enabling the comparison of companies internationally (Ames, 2013:154). South Africa, as one of the first countries, adopted the IFRS in 2005 due to increasing pressure for standardised global accounting standards (Ames, 2013:154). The adoption of the IFRS required of all Johannesburg Stock Exchange (JSE) -listed companies to comply with these standards (Ames, 2013:156).

Even with the implementation of IFRS and King II in South Africa, the global financial crisis in 2008 ignited a worldwide recession (WBCSD, 2014:6). The WBCSD (2014:6) explained in their report that it became apparent that traditional reporting did no longer cover risks efficiently enough. Given the global financial crisis, King III was released in 2009, which is the first King report to include IRG (WBCSD, 2014:6). The third King report points out that IRG will strengthen the confidence and trust of its stakeholders as well as establish the acceptability of a company’s actions (IoDSA, 2009:11-12).

By incorporating King III into the JSE’s listing requirements, it ensured that, from 1 March 2010, all JSE-listed companies are required to apply IRG or explain why they did not (JSE, 2017; WBCSD, 2014). This does not mean that companies should provide an IR, seeing that they could produce reports which adhere to the main principles of the King III, corporate governance guidelines or JSE requirements, without adopting such a formal report (Dumay, Bernardi, Guthrie & La Torre, 2017:464). However, increasingly companies are providing IRs since they are moving away from merely combining their financial statements and sustainability report (EY, 2017:3). As a result, companies provide IRs of a high quality (EY, 2017:3).

Meanwhile in 2009, Prince Charles of Wales met with various accounting bodies, companies, investors, standard setters and United Nations (UN) representatives (Bhasin, 2017; Erol & Demirel, 2016:34). These role-players joined forces to form the International Integrated

Reporting Committee (IIRC) in 2010 to oversee the development of a globally accepted reporting framework (Barth *et al.*, 2016; Deloitte, 2017; Hurks *et al.*, 2016:519; De Villiers, Venter & Hsiao, 2017). The aim was to guide companies on ways to prepare an IR that would communicate the long-term creation or destruction of values for a broader group of capitals (Barth *et al.*, 2016; Deloitte, 2017; Hurks *et al.*, 2016:519; De Villiers, Venter & Hsiao, 2017). The IIRC therefore helped correct the mismatch between the capitals that influence value and sort out current corporate reporting issues as explained by KPMG (2012:7). As stated in par. 1.1.1, the IIRC published its IIRF in 2013. The IIRF has been developed in response to the IIRC's vision that the IRG should be the norm for corporate reporting (IIRC, 2013:1-2). The reason is that IRG emphasises reporting on value creation in all corporate aspects, thereby incorporating integrated thinking within the company (IIRC, 2013:1-2).

The King IV report was issued in 2016, emphasising the importance of IRG (IoDSA, 2016:4-5), which was drafted while considering the IIRF with its six capitals (as explained in par. 1.1.2) (IoDSA, 2016:4, 28). The 'apply-or-explain' approach of King III was changed to the 'apply-and-explain' approach in King IV (IoDSA, 2016:7). The IoDSA (2009:5) asserts that the journey from siloed reporting to IRG was necessary to create "an inclusive, sustainable capital market system".

In light of the discussion above, the journey to IRG is illustrated in Table 2.1 below.

Table 2.1 Journey to integrated reporting

1998 – 2002: Emphasis placed on financial disclosures based on accounting standards (EY, 2017:4)	
1994	King I issued
2001	Introduction of IFRS
2002	King II issued
2003 – 2011: Corporate reporting includes non-financial aspects to accompany financial reporting in a separate report (often termed a 'sustainability report') (EY, 2017:4).	
2005	Listed companies in South Africa adopt IFRS
2008	Global financial crisis
2009	King III issued
2010	Listed companies in South Africa required to apply IRG or explain why they fail to do so.
2010 – 2018 Corporate reporting includes an IR, which explains how an organisation creates value to all relevant stakeholders (IIRC, 2013:1, 4).	
2013	IIRC publish IIRF
2016	King IV issued

Table 2.1 above indicates the far-reaching changes in corporate reporting over the last 20 years. In this regard, the main change was the move from focusing on the financial capital to incorporate all capitals.

2.2.2 The purpose of integrated reporting – incorporating all capitals

According to the World Federation of Exchanges (WFE) (2018:1), the total domestic market capitalisation at the end of 2017 reached a record high of $87.1 trillion. The world GDP figure for 2016 was almost $76 trillion (World Development Indicators database, 2017). Thus, by only considering the Forbes Global 2 000 ranking, these 2 000 companies accounted for $35.3 trillion in revenue and $2.5 trillion in profit (Forbes, 2017). The significant financial value of companies prove how important companies have become (Eccles & Saltzman, 2011:58). King (2012:535) contributes to this view by stressing that major multinational companies presently have economies larger than those of governments. These companies have a massive influence and impact on the world and its people (King, 2012:535). Therefore, a seemingly insignificant misstep can have significant consequences for the company and all the people affected by the company (Wijnhoven, 2014:9).

The industrial disaster, BP Deepwater Horizon's oil spill, led to direct costs of $37.2 billion and a loss in market value of $105 billion (Wijnhoven, 2014:9). The financial implications were

described as follows, “GDP doesn't measure lots of things. The BP oil spill was, for instance, associated with activity that increases GDP but we need a measure that would reflect the actual cost of it if things like cleaning up the mess and damage to the environment are factored in” (Stratton, 2010). A more recent example of a malpractice is a top JSE-listed company, Steinhoff International Holdings Ltd, whose share price collapsed after the former CEO resigned following the revelation of accounting irregularities (PSG Wealth, 2017). A third example is the reputation of the audit firm KPMG South Africa, that were tainted seriously after its involvement in several auditing scandals during 2017 and 2018 (Businesstech, 2019; Khumalo, 2018).

It is significant that KPMG South Africa has issued its first IR titled ‘Rebuilding Trust, Redefining Professionalism’, in March 2019 in the hope of regaining trust amid the scandals that crumpled its trustworthiness (Businesstech, 2019; KPMG South Africa, 2019; Nkuhlu, 2019). In the words of Prof Wiseman Nkuhlu (2019) (Executive Chairman of KPMG South Africa): “The report forms an important part of our ongoing commitment to transparency and accountability and gives our stakeholders the opportunity to assess our progress.”

According to Wijnhoven (2014:9), an example of the constant change in media technology, where sensitive information are leaked, demonstrates the increasing demand for transparency. In the same vein, Sifry (2011:8-9) asserts that “we should be demanding that the default setting for institutional power be ‘open’”. Companies will have to report in a more transparent manner to ensure they do not encounter a situation that destroys value (Wijnhoven, 2014:9). Evidently, it must be a priority for companies to report on all its capitals as missteps can occur in any of these capitals, which will have an impact on investors and other stakeholders.

Wijnhoven (2014:9) points out that in modern times, companies are constantly scrutinised, due to constant changes in technology and growing expectations by the public. Buitendag, Fortuin and De Laan (2017:2) concur that in the current era large companies command and control important and often core facets of people’s everyday lives. Therefore, it is vital that investors have the appropriate information to assist them with their decision-making, as these companies are responsible for a substantial amount of financial, natural, and human resources (capitals in terms of the IIRF) (Eccles & Saltzman, 2011:58). Likewise, this information is important to stakeholders, for example employees and customers, who use it to decide where to work and make purchases (Eccles & Saltzman, 2011:58). From the discussion above, it is clear that this single report, the IR, is crucial in meeting the growing expectations of investors and stakeholders with regard to transparency and accountability (Bernardi & Stark, 2016; Erol & Demirel, 2016:32)

Par. 2.2.1 explained how corporate reporting evolved from an emphasis on financial reporting to IRG, which emphasises value creation for all stakeholders. The IIRF defines an IR as “a concise communication about how an organisation’s strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term” (IIRC, 2013:7). Numerous studies have highlighted the ability of IRG to combine financial and non-financial information in a single report (Abeysekera, 2013:227-228; De Villiers *et al.*, 2014; Eccles & Saltzman, 2011; Perego, Kennedy and Whiteman, 2016; Serafeim, 2015). Henk de Bruin (cited by Eccles and Saltzman (2011:60)) points out that “there are synergistic elements between the finance discipline and sustainability discipline”. The financial aspect focuses on high-quality data, whereas the sustainability aspect emphasises communication and a stakeholder-oriented approach towards various parties (Eccles & Saltzman, 2011:60). The sustainability component informs the finance component that companies do not communicate merely to meet statutory obligations and enlighten shareholders (Eccles & Saltzman, 2011:60). This form of one-channel communication can be used to transfer significantly more information (Eccles & Saltzman, 2011:60).

Furthermore, instead of adopting the backwards-looking reporting approach of existing financial and sustainability reports, IRG provides future-oriented information on all capitals (Dumay & Dai, 2017; IIRC, 2011:9). This will assist stakeholders who are becoming more interested in the long-term sustainability of an entity (Hurks *et al.*, 2016; Jennifer Ho & Taylor, 2007:123), as reported in par. 2.1. Robbetze (2015:20) mentions that the current returns on an investment is not investors' only concern. They are also concerned whether the company can be responsible for “future shareholder wealth maximisation by making provision for advancement” Robbetze (2015:20).

To recap: there is a distinct change in perspective from merely financial and sustainability reporting to all capitals, as well as from reporting on the past to reporting with a future outlook. Therefore, it is apparent that management will need a change in mind-set.

Gentry and Fernandez (1997:1) argue that an annual report is one of the most important sources of information to evaluate a company’s value. IRs have the potential to add crucial information to current corporate reports (Barth *et al.*, 2016:10). These include the annual and corporate social responsibility (CSR) reports which users of IRs may find valuable in their decisions about allocating capital (Barth *et al.*, 2016:10). As discussed in par. 2.2.1 “The journey to IRG”, the IR replaces annual and other reporting to provide a single report for companies to publish. Therefore, the IR will become the primary source of information to determine a company’s value. Black Sun Plc (2014:18) found in responses to their survey that 79% of companies that publish an IR believe that this instrument increases financial capital

providers' confidence in the long-term viability of their business models. This is in line with the focus of IRG on a company's capacity to create value in the short, medium and long term (IIRC, 2013:2).

Based on the preceding discussion, it can be argued that future shareholder wealth maximisation takes place when companies provide an IR that includes quality financial information. Apart from the advantages to the individual investors, it will also benefit other users of financial information. Over time, investors will be able to compare the performance of their portfolio of investments in companies that practise IRG, over those that do not (Eccles & Saltzman, 2011:61).

As explained in par. 2.2.1, IRG has a significant role to sustain as the perceived potential solution to previous corporate reporting issues. Healy and Palepu (2001:411) argue that companies will not choose voluntary to provide an IR if they would not gain benefits in the process. Eccles and Saltzman (2011:61) suggest companies should be required to report on both their financial and non-financial capitals, which will help improve their management of natural, human, and financial resources. IRG is becoming increasingly popular in companies and on a national and international level (Barth *et al.*, 2016:1). According to King (2017), a study was undertaken over a two-year period comparing 80 companies of which 40 had not prepared an IR. The 40 companies that prepared an IR performed better in both their bottom-line and share prices than the other 40 did (King, 2017). Eccles and Saltzman (2011:59) identify three types of benefits gained by IRG, which are discussed in more detail below.

Internal corporate benefits: Firstly there are *internal* company benefits. IRG will lead to an improved allocation of internal resources, improved communication with shareholders and stakeholders, and decreased risks of damage to the reputation (Eccles & Saltzman, 2011:59). De Bruin (cited by Eccles and Saltzman (2011:60)) concurs with the internal benefits and posits that the IR explains in a simple and easily available manner to employees of the processes within the company. IRG also increases their pride in their employer with the knowledge that the company is serious about sustainability (Eccles & Saltzman, 2011:60). Black Sun Plc (2012:3) found that IRG links departments within the company and helps break down silos. IRG helps improve internal processes by providing more transparency of the various company activities as the study indicated that 48% of respondents are moving towards IRG to "improve their internal processes" (Black Sun Plc, 2012:9). The IIRC (2011:21) lists the internal benefits of IRG that have been identified in research to date. IRG leads to improved decisions to allocate resources IIRC (2011:21). Thereafter, such decisions help reduce costs and improve the engagement with current and potential future employees, which in turn, helps attract and retain skills in the company IIRC (2011:21). Finally the benefit of a common

language leads to more effective teamwork across the company's different functions IIRC (2011:21).

External market benefits: Secondly, there are *external* market benefits. According to Eccles and Saltzman (2011:59), IRG will ensure companies meet their investors' needs for accurate information on the ESG. In the same vein, research by Black Sun Plc (2012:19) showed that IRG will lead to a better understanding of stakeholders' requirements. KPMG (2012:5) agrees that IRG can help users get a clearer understanding on the long-term value by examining previous short-term results by companies. It is further anticipated that IRs will decrease the information gap and help investors with their resource allocation choices (Arguelles *et al.*, 2015:1).

Bray (2011:7) of KPMG Australia points out that early adopters of IRG "note positive comments from their investors and they expect their cost of capital will more closely mirror their strategy". IRG aims to decrease the clutter of traditional corporate reporting by encouraging concise transfer of information (Zhou *et al.*, 2017:2). The IIRC (2011:21) identifies further examples of external benefits from IRG such as more correct non-financial information accessible for data vendors, increased trust levels with key stakeholders, and more accurate identification of opportunities. The benefits further include: improved communication with investors and other stakeholders, decreased reputational risks and improved access to capital due to value-added disclosure IIRC (2011:21). IRG will be of interest not only to investors, but "all stakeholders such as customers, suppliers, employees, government and local communities" (Jhunjhunwala, 2014:1).

Non-financial information is becoming progressively more important for banks (NEMACC, 2014:51). As credit providers, these institutions require a complete picture of a company's financial and other performance such as the company's effect on the environment and its people (NEMACC, 2014:51). This can be accomplished if the company provides an IR. According to a PWC survey, 74% of Chief Executive Officers (CEOs) stated that to measure and report on all activities that affect the company (social, environmental, fiscal and economic) will contribute to the success of the company in the long-term (PWC, 2014:13). A South African study by Steyn (2014:476) surveying the top management (CEOs or Chief Financial Officers [CFOs]), identifies enhanced corporate reputation as a key benefit for companies implementing IRG.

Managing regulatory risks: Thirdly, IRG provides a benefit by managing regulatory risks (Eccles & Saltzman, 2011:59). In this regard, the IIRC (2011:21) lists improved risk management as one of the IRG' benefits. This ensures companies are prepared for global regulation and can respond to requirements of stock exchanges IIRC (2011:21). Thus, IRG

gives companies the opportunity to be heard and to make a difference during the development of frameworks and standards (Eccles & Saltzman, 2011:59). From an organisational standpoint, IRG is expected to improve the processes of risk management (Solomon & Maroun, 2012:8).

From the discussion above, it can be concluded that IRG followed a significant journey and the presence and impact of such reporting merit research. In the words of Eccles and Saltzman (2011:59): “There really is no alternative to integrated reporting.” PWC interviewed senior investment professionals employed by certain large investment companies (PWC, 2016). These professionals confirmed that ESG information, which is non-financial in nature, is a “leading indicator for future financial impacts” (PWC, 2016). Even though the link between IRG and integrated thinking is important, investors want to be informed of IRG’s impact on the company’s financial performance (Churet & Eccles, 2014:14). The financial component of company disclosure is examined in par. 2.3 below. This section investigates the importance of financial indicators in order to respond to secondary objective b (see par.1.4.2.1).

2.3 THE IMPORTANCE OF FINANCIAL PERFORMANCE, RISK AND GROWTH, AND ITS INDICATORS

In par. 2.2 above, the importance of IRG was investigated by examining the journey to IRG and the purpose and benefits of providing an IR. The importance of non-financial information to be included in the IR was emphasised. The following subsections highlight and discuss the importance of the financial information.

2.3.1 Defining financial performance, risk and growth, and its importance

This subsection focuses on the importance of financial performance, risk and growth. Thus, first these terms relevant to this study are explicated below.

Financial performance: The BusinessDictionary (2018b) defines this term as: “measuring the results of a firm's policies and operation in monetary terms. These results are reflected in the firm's return on investment, return on assets (ROA), value added, etc.” According to Investopedia (2018b), the term can be defined as “a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues”. Financial performance is also viewed as a general measure of a company's “overall financial health over a given period of time” (Investopedia, 2018b). This performance can be measured to compare similar companies within an industry, or to compare industries or aggregated sectors (Investopedia, 2018b).

From the interpretations above, it can be reasoned that the financial performance of a company is important as this measures its financial results to evaluate the financial well-being.

Risk: The Merriam Webster Online Dictionary (2018c) defines this aspect as "the chance that an investment will lose value". Correia, Flynn, Uliana and Wormald (2015:3-3) argue that risk entails any difference between the anticipated and actual results that leads to the possibility of a loss. Risk measures the uncertainty which investors are prepared to endure to gain from the investment (Anon, 2018). Investopedia (2018c) states that financial risk in particular refers to "the possibility that shareholders will lose money when they invest in a company that has debt, if the company's cash flow proves inadequate to meet its financial obligations". In addition, the BusinessDictionary (2018c) explain financial risk as "the probability of loss inherent in financing methods which may impair the ability to provide adequate return".

Thus, it can be posited that the term 'risk' implies possible losses that may be incurred due to the difference between expected and actual results. Financial risk in particular, refers to a financial loss (e.g. an investment losing value) due to a lower actual return than anticipated. If an investments' value decreases or its rate of return is lower than anticipated, the investors have incurred a financial loss. Financial risk is crucial to consider since it can affect various stakeholders. In this regard, financial losses may have the following outcomes: retrenchments, the inability to pay creditors, or investors losing the value of their investment.

Growth: The Oxford English Dictionary (2018a) defines this aspect as "the process of increasing in size, amount, value, or importance," while the Merriam Webster Online Dictionary (2018a) simply mentions that 'growth' means to expand or increase. Financial growth is important since it demonstrates that a company is improving annually. For the purpose of the present study, growth is viewed as the increase of financial ratios or values.

The three terms, financial performance, risk and growth, are combined in the present study under an overarching phrase: *financial indicator categories.* Such a combination is crucial to consider, seeing that companies' financial performance may be excellent, even though they are prone to various risks and may not be growing financially. The IIRF does not propose key performance indicators (KPIs), but an IR must communicate material information on the performance of a company (IIRC, 2013:28; Lee & Yeo, 2016b), which take into account the impact on financial capital. Accounting information in the financial statements are the primary source of information about a company's performance (Kanodia & Lee, 1998:34; Lim, Lee & Chang, 2015). Since accounting information is crucial, the use of financial indicators is examined in the following subsection.

2.3.2 Stakeholders' use of financial indicators

Investors as users of financial indicators

The IIRF ascertains that the key users of an IR are the providers of financial capital (Baboukardos & Rimmel, 2016; Bernardi & Stark, 2018; IIRC, 2013:7). It is well known that

investments are the dinamo behind the growth of an economy (Gabriela, 2011:1353). Levine and Renelt (1992:942) identify the following relationship: “positive, robust correlation between growth and the share of investment in GDP and between the investment share and the ratio of international trade to GDP”.

Decision-making on investments is an exceptionally complex practise (Li & Tsang, 1999:1253). Investors think through numerous factors before making the decision to invest in a company (Nagy & Obenberger, 1994:65). Nagy and Obenberger (1994:67) list these factors as: neutral information; accounting information; self-image and firm-image coincidence. The importance of the accounting information factor, which indicates financial performance, risk and growth, is discussed subsequently. Other identified factors fall outside the scope of the present study and will not be considered.

Accounting information can be found in a company’s annual reports, financial statements and prospectuses (Nagy & Obenberger, 1994:66), and presently, in the IR. Higgins (2012:3) typifies accounting as “the scorecard of business”. Financial statements provide a clear picture of the company’s actual state of affairs (Higgins, 2012:5). Such statements convert a company’s various activities into a series of objective figures that deliver information about its performance, difficulties, and predictions (Higgins, 2012:3). The results of an analysis by Nagy and Obenberger (1994:66) indicate that investors value traditional aspects as essential. These are expected earnings and the state of the financial statements as part of the accounting information factor (Nagy & Obenberger, 1994:66).

Extensive literature supports the finding of Nagy and Obenberger that investors place high value on financial information. Vestine and Kule (2016:299) and Higgins (2012:6) view the analysis of financial statements as important to examine a company’s performances, in order to make investment decisions. Healy and Palepu (2001:405) point out that financial reporting and disclosure help communicate the company’s performance and governance to possible investors. Blessing and Onoja (2015:12) argue that a company presents its financial health condition by publishing its financial statements aimed at various users to enable sensible investment decisions. Jagongo and Mutswenje (2014:100) highlight certain factors that influence investment decisions such as the company’s position and performance, return on investment, or the firm’s goodwill. These factors include accounting information such as anticipated corporate earnings, profit, share price, or the condition of the financial statements (Jagongo & Mutswenje, 2014:100)

Gentry and Fernandez (1996:7) found that while environmental factors are considered by the surveyed analysts and CFOs, these are not part of the key criteria used for corporate valuations. Seemingly, investors only briefly consider modern concerns such as national or

international operations, the history of environmental performance and the company's ethical stance (Nagy & Obenberger, 1994:67). Evidently, investors pay more attention to the expected accounting performance of the company concerned (Aroni, Namusonge & Sakwa, 2014; Robbetze, 2015).

A company can be viewed as an "investment portfolio for the capital suppliers, associates and creditors who considered this resource allocation to be the best option at the time of the investment" (Gabriela, 2011:1352). Investors attempt to predict which companies will offer the best return for their money (Aroni *et al.*, 2014; McIntosh, 2018). This is done by analysing the amounts reported on each financial statement and comparing those results with the amounts on financial statements from other companies (Aroni *et al.*, 2014; McIntosh, 2018). From these interpretations, it can be inferred that accounting information, which provide indicators on financial performance, risk, and growth, is essential to help investors examine the financial well-being of a company.

Other users of financial indicators

Investors are, however, not the only users of financial indicators. According to Brealey (2008), cited by Robbetze (2015:28), users, for example, employees, management, suppliers, bankers and shareholders also scrutinise financial statements for economic information. These statements provide information about the financial position of a company, its performance and changes that benefit various users by helping them make key decisions on management and investment (Blessing & Onoja, 2015:13). Such mentioned users are the following: "managers, directors, employees, prospective investors, financial institutions, government regulatory agencies, media, vendors and general public" (Blessing & Onoja, 2015:13). The analysis of a company's financial performance is important not only to shareholders; also to a wider range such as creditors, regulators, analysts, the general public as well as notably to management (Blessing & Onoja, 2015; Delen, Kuzey & Uyar, 2013:3970; Higgins, 2012; Smart & Megginson, 2008).

Higgins (2012:3) points out that the analysis of financial statements is important to a wide variety of users consisting of investors, creditors and regulators. Brealey, Myers and Allen (2011:590) explain that credit scoring systems mainly rely on financial statements to estimate which companies are most likely to become bankrupt and therefore be unable to pay their debts. In a study by Maroun (2017:329), a panel of experts were interviewed to elicit their opinion on the preparation of IRs. Almost half of the experts, preparers of the IR and auditors, indicated that they mainly consider financial returns as the key indicator of a company's sustainability (Maroun, 2017:337).

From the discussion above, it can be concluded that accounting information and its analysis allow the various users of the financial statements to assess whether a company is acting in their best interests (Robbetze, 2015:28). The following subsection evaluates previous studies about the impact that IRG has on financial indicators.

2.4 ANALYSIS OF LITERATURE ON THE IMPACT OF INTEGRATED REPORTING ON FINANCIAL INDICATORS

IRG is still in its development period and not yet implemented or compulsory for all companies. Therefore, it is noteworthy to review the progress being made on this relatively new reporting framework as well as the implications of implementing IRG. As explained in par. 1.2 above, empirical evidence (research focusing on market reactions) on the benefits related to IRG is sparse, and even more so studies on the impact IRG has on financial indicators. Zhou *et al.* (2017:6) posted a significant question, “Does IRG has [sic] real benefits or is just a passing fad?” In answer to this question, empirical studies were evaluated, by means of a document analysis, to determine which studies specifically consider the impact of IRG on financial indicators.

Most of these studies were included in the present study’s literature review, seeing they often are cited by other researchers or among each other. Table 2.2 below provides a summary of 11 previous studies in which the impact was examined that IRG has on specific financial indicators.

Table 2.2 Previous research on the impact of IRG on financial indicators

Title	Financial indicators examined	Focus of study: sample, period & location covered	Findings
1) The economic consequences associated with IR quality: Early evidence from a mandatory setting (Barth *et al.*, 2016)	• Share liquidity (bid-ask spread) • firm value (measured using Tobin's Q) • expected future cash flows and • cost of capital (CoC)	**South-Africa:** 224 company-year observations on the JSE 31 December 2011, 2012 and 2013	Positive association between IRG quality and share liquidity, firm value and expected future cash flows. Weak and inconsistent association of IRG quality with cost of capital.
2) Does IRG matter to the capital market? (Zhou *et al.*, 2017)	• Analysts' earnings forecast analysis • CoC	**South-Africa:** 433 company-year observations on the JSE Period 2009 to 2012	The increase in a company's level of alignment with the IIRF decreases analysts' forecast error. The increase in a company's level of alignment with the IIRF leads to a subsequent decrease in the cost of equity capital for certain companies.
3) The association between IRG and firm valuation (Lee & Yeo, 2016)	• Market value of equity plus book value of total liabilities divided by total assets (TA) • TA • ROA • sales growth of prior year • long-term debt divided by book value of total assets (Debt)	**South-Africa**: 822 company year-end observations on the JSE Period 2010 to 2013	Positive correlation between firm valuation and IRG disclosures. Firm valuation associated more positively with IRG in companies with higher organisational complexity. In companies with larger external financing requirements, the sub-sample of companies with greater IRG has higher firm valuations. This suggests that IRG alleviates the asymmetry in information amongst corporate insiders and external providers of capital. Companies with high IRG have a better share market and accounting performance than those with low IRG.

Table 2.2 Previous research on the impact of IRG on financial indicators (continues)

Title	Financial indicators examined	Focus of study: sample, period & location covered	Findings
4) Value relevance of accounting information under an IRG approach: A research note (Baboukardos & Rimmel, 2016)	• Book value of equity • market value of equity (six months after fiscal year-end scaled by the number of common shares) • EPS (earnings before interest and taxation (EBIAT) scaled by number of common shares) • TA • return on equity (ROE) • leverage	**South-Africa:** 954 JSE-listed companies Period 2008 to 2013	The implementation of IRG leads to a noteworthy increase in the earnings' valuation coefficient, but a weakening in the value relevance of net assets. To the degree that the earnings-price relation indicates a company's CoC, the improved valuation coefficient of earnings indicates that integrating financial and sustainability information impact negatively on a company's cost of equity capital.
5) IRG, quality of management, and financial performance (Churet & Eccles, 2014)	• Return on invested capital (ROIC)	**Worldwide**: Companies from RobecoSAM's database. Period 2011 and 2012	No definite evidence that IRG are associated with companies attaining a higher ROIC over the past ten years.
6) The association between IRG and information asymmetry (Van den Akker, 2017)	• Share liquidity (bid-ask spreads) • cumulative abnormal returns	**Worldwide:** Northern-American listed companies from the Global Reporting Initiative (GRI) report. Period 2010 to 2015	Companies with an IR have a noteworthy lower bid-ask spread in relation to the control group. Initially, no supporting evidence indicated that IRG lowers cumulative abnormal returns. Further tests indicate that following the release of the IIRF, the cumulative returns are lower relative to the control group. The findings propose that IRG is correlated negatively to information asymmetry.

Table 2.2 Previous research on the impact of IRG on financial indicators (continues)

Title	Financial indicators examined	Focus of study: sample, period & location covered	Findings
7) How relevant is IRG? (Lopes, Oliveira & Coelho, 2017)	• Book value • operating income • leverage • TA • ROE • EPS • market value	**Worldwide:** All companies from IIRC Examples Database Period 2006 to 2015	Either the book value of equity, or operating income has an affirmative and statistically noteworthy impact on the market value. These results are strengthened when they are derived from companies identified as reporting 'best practice' in IRG.
8) Effects of IRG on the firm's value: Evidence from voluntary adopters of the IIRC's framework (Martinez, 2016)	• cost of equity • CoC • expected future cash flows (FCF) • market value • Spread (median of daily ratio of bid minus ask price divided by the average of the bid and ask price) • annuity (ten-year annuity of share price discounted by CoC, deflated by total assets by share) • market to book ratio of equity • market to book ratio of total assets • leverage • EPS growth ratio • accruals (difference of net income minus operating cash flow by total assets) • ROA • TA • cash (cash and equivalents scaled by total assets) • dividends paid	**Worldwide:** 384 companies included in the IIRC database by September 2016, excluding the following: JSE-listed and other non-listed companies, listed/delisted companies during fiscal year (FY) 2011-2014, companies with first IR after FY 2014 and with missing variables in the databases. FY 2011 and 2015	IRG is connected positively to market value and expected future cash flows, however not with bid-ask spread or implicit cost of capital. IRG improved investor's perception of the company's future cash flows but did not advance the company's information environment.

Table 2.2 Previous research on the impact of IRG on financial indicators (continues)

Title	Financial indicators examined	Focus of study: sample, period & location covered	Findings
9) Towards the existence of IRG: an international perspective (Coelho, 2016)	• market value per share • book value per share • operating income • EPS • TA • ROE • leverage	**Worldwide (including South-Africa):** IIRC database comprising examples of IRs of companies, which publish it according to the IIRC guiding principles (reference reporters) and regular reporters. Period 2006 to 2015	Companies that report their IR based on the IIRC guiding principles disclose an improved financial position (with higher total assets, operating income and market value and a lower debt level) as compared to other IRG reporters.
10) Is IRG really the superior mechanism for the integration of ethics into the core business model? An empirical analysis (Maniora, 2017)	• share price over book value of equity per share at year-end • ROA • size (market value of equity at year-end) • leverage	**Worldwide:** 200 - 300 companies Period 2002 to 2011	There is a positive relationship between IRG and all performance measures that were constantly statistically greatly significant. The findings suggest that companies implementing IRG, display higher economic and ESG performance levels than companies that do not apply this mechanism.
11) Enhancing market valuation of ESG performance: Is IRG keeping its promise? (Mervelskemper & Streit, 2017)	• market value of equity	**Worldwide:** 852 company-year observations Period 2010 to 2014	Applying IRG can further improve the market valuation of a company's combined ESG and corporate governance performance to an economically and statistically noteworthy degree without incurring further cost. IRG is superior to stand-alone ESG reporting regarding the improved market valuation of ESG performance.

Source: Researchers listed above

When considering the period of previous studies in Table 2.2, a lack of recent research is apparent. The reason is that the specified researchers have only used financial information from 2006 to 2015, of which only three of the studies examine the years until 2015. Table 2.3 below provides an objective view of the financial indicators analysed from the above-mentioned studies. This table categorises the ratios in terms of various classes as well as the financial indicator categories for purposes of this study as: financial performance, risk or growth. This summary also indicates whether there is a positive (+) or negative/no (-) correlation between the financial indicator and IRG.

Table 2.3 Summary of financial indicators

Financial indicator	Ratio class	Financial indicator category	Study number as per Table 2.2											Total
			1	2	3	4	5	6	7	8	9	10	11	
Return on assets	Profitability	Financial performance			+					+		*		3
Book value of equity	Debt management	Financial risk				**			+		+			3
Market value of equity (for study 1: firm value measured using Tobin's Q)	Market ratios	Financial performance	+			**			+	+	+	+	+	7
Return on equity	Profitability	Financial performance				**			+		+			3
Operating income	Profitability	Financial performance							+		+			2
Earnings per share	Market ratios	Financial performance				**			+	+	+			4
Expected future cash flows	Cash flow	Financial performance	+							+				2
Return on invested capital	Profitability	Financial performance					-							1

Table 2.3 Summary of financial indicators (continues)

Financial indicator	Ratio class	Financial indicator category	Study number as per Table 2.2											Total
			1	2	3	4	5	6	7	8	9	10	11	
Cost of capital	Profitability	Financial performance	-	+						-				3
Cost of equity	Profitability	Financial performance								+				1
Analysts' earnings forecast analysis	Market ratios	Financial performance		+										1
Cumulative abnormal returns	Market ratio	Financial performance						+						1
Accruals (five-year average of the ratio of difference of net income minus operating cash flow by total assets)	Debt management	Financial performance								-				1
Annuity (ten-year annuity of the share price with discounted by CoC, deflated by the total assets by share)	Profitability	Financial performance								+				1
Market-to-book ratio of total assets	Market ratios	Financial performance								+				1
Prior year sales growth	Profitability	Financial performance			*									1
Market-to-book ratio of equity	Market ratios	Financial performance								+				1
Spread (median of daily ratio of bid minus ask price divided by the average of the bid and ask price)	Profitability	Financial performance								-				1

Table 2.3 Summary of financial indicators (continues)

Financial indicator	Ratio class	Financial indicator category	Study number as per Table 2.2											Total
			1	2	3	4	5	6	7	8	9	10	11	
Leverage (for studies 3, 8 & 9: total debt divided by total equity, for studies 4, 7 & 10: total liabilities divided by total assets)	Debt management	Financial risk				**			+	-	+	*		5
Share liquidity (bid-ask spread)	Debt management	Financial risk	+					+						2
Total assets	Asset management	Financial growth			+	**			+	+	+			5
Cash	Asset management	Financial growth								-				1
Share price over book value of equity per share at year-end	Asset management	Financial growth										*		1
Dividends paid	Profitability	Financial performance								-				1
Debt	Debt management	Financial risk			*									1
Market value of equity plus book value of total liabilities divided by total assets	Market ratios	Financial performance			+									1

* not a significant correlation

** mixed findings

Source: Own research adopted from researchers listed in Table 2.2

Table 2.3 above indicates that various ratio types in all three financial indicator categories were evaluated in the 11 previous studies. In this regard, Table 2.4 below summarises the number of times one or more of the three financial indicator categories were used in the mentioned 11 studies.

Table 2.4 Number of observations included in financial indicator category

Financial indicator category	Total number of observations used as per Table 2.3
Financial performance	19
Financial risk	4
Financial growth	3

Source: Own research

From the discussion above, it is evident that the impact of IRG on financial indicators is topical. Previous research also shows clearly that financial indicators can be of significant value to the various stakeholders. Seemingly limited ratios were tested in the various financial indicator categories since most of the studies used their own financial indicators they viewed as important. Furthermore, these studies are limited to the year 2015 and only examined certain financial indicators. The next part of the present study investigates various financial ratios to determine which could be analysed in this study.

2.5 ANALYSIS OF FINANCIAL RATIOS AS FINANCIAL INDICATORS

Siegel and Shim (2000:362) define ratio as the “relationship of one amount to another”. A ratio as a valid tool to measure numerical relation, must be an element that consists of a numerator and denominator – items that indicate a mutually integral and similar relationship (Brady, 1999:6). A simple literature search on Google Scholar on 24 April 2019 for the topic ‘financial ratio’ uncovered over four million publications. The popularity of financial ratios demonstrate their perceived usefulness when making financial decisions (Gouws & Lucouw, 1999:107). Knowledge is created when financial information is analysed and interpreted (Cassim, 2014:23). This makes financial ratios a popular instrument by which to evaluate a company’s performance, risk and growth (Gouws & Lucouw, 1999).

Brady (1999:1) defines the analysis of financial statements as a practise of processing information, which provides data for decision-makers by interpreting financial reports. This processing utilises several techniques such as ratio, common-size and trend analysis Brady (1999:1). These techniques are applied to evaluate the position of the company and monitor performance by highlighting the comparative and relative significance of the reported information (Brady, 1999:1). Myšková and Hájek (2017:97) emphasise that financial analyses that evaluate the financial health of a company and its performance has attracted increasing

attention in contemporary literature. In this regard, they cite several present-day researchers (e.g. Kotane & Kuzmina-Merlino, 2012; Beaver *et al.*, 2010; Kovárík & Klímek, 2012; Brendea, 2014; Lee, 2014; Kubenka, 2016).

The ratio analysis of financial statements help evaluate the liquidity position, long-term solvency, operating efficiency, and profitability of the company (Das, 2010:13). This includes inter-firm comparisons, in other words, where ratio analysis helps compare the different aspects of one company with another (Das, 2010:13). Lev (1974:11) and Brady (1999:1) also mention that ratio analysis accelerate the processing of data by decreasing the large amount of items into a set of small meaningful indicators.

Financial ratios to analyse financial statements are compared across industries to ensure investors make informed decisions (Aroni *et al.*, 2014:62). Smart and Megginson (2008:48-49) add that financial ratios are an effective tool for financial analysis since it allows the analyst to recognise financial trends and compare the financial results of various companies in the same industry. Brady (1999:7) explains that for measuring trends of a company, it is valuable to compare ratios over a certain period, seeing that it may signal possible disorder in the financial performance that deviate from the average. Furthermore, Higgins (2012:61) states that the most valuable method to evaluate ratios is trend analysis. This entails calculating ratios for a company over numerous years to determine alteration over the years Higgins (2012:61). In the present study the financial ratios of the same companies over various years had to be examined for the ratios to deliver useful information.

Myšková and Hájek (2017:97) point out that the assessment of a company's financial performance is first and foremost based on numerous financial analysing methods. Blessing and Onoja (2015:23) view the analysis of financial statements as crucial for investment decisions, since such an analysis helps investors establish the financial strengths and weaknesses of a company. Furthermore, analysing financial statements can also expose the 'red flags' or potential profit of an investment opportunity (Blessing & Onoja, 2015:23). Ehrhardt and Brigham (2011:89) purport that financial ratios are calculated to extract important information that may not be apparent simply from scrutinising a company's financial statements.

Higgins (2012:15) explains that creditors and investors generally have two essential questions on company performance: "How did the company perform in the last period?" and "How will the company perform in the future?" These questions can be answered by studying certain financial ratios (Higgins, 2012:15). Oberholzer and Van der Westhuizen (2009:134) point out that financial ratios can be used as instrument to measure performance. Financial ratio analysis can be found in freely available sources such as financial databases, companies'

financial statements and market reports and it is used mostly for their simplicity as being easy to calculate (Myšková & Hájek, 2017; Oberholzer, 2012:417). Higgins (2012:6) asserts that the most important source of financial information of a company is its financial statements. Therefore, it will be time-efficient to use the financial ratios to analyse a company. In this regard, it can be argued that financial ratios will suit the purpose of the present study as it will help determine whether IRG does impact financial indicators.

However, Brady (1999:6-7) emphasised that a single ratio in silo is meaningless since it does not provide a comprehensive picture or sufficient answers; thus, it is simply unprocessed data instead of information. Practitioners and researchers have established a vast number of ratios to be applied when evaluating the financial performance and position of a company (Brady, 1999:29; Lev & Sunder, 1979). This is also evident in the various financial indicators analysed in Table 2.3 above. Higgins (2012:60) explains that a ratio is "simply one number divided by another". Therefore it is unrealistic to expect that the calculation of one or even a few ratios can automatically provide important insights into a multifaceted, present-day company Higgins (2012:60). Only when financial ratios are evaluated jointly with additional knowledge of a company's management and economic environment, can such an analysis reveal sufficient information about the company (Higgins, 2012:60). Blessing and Onoja (2015:23) point out that financial statements are retrospective by nature, therefore investors should always consider ratios in all the statements and not only examine a single statistic or metric.

IAS 1 states that the financial statements consist primarily of a statement of profit or loss and other comprehensive income (SoCI); the statement of financial position (SoFP); statement of changes in equity (SoCE); the cash flow statement (CFS); and relevant notes (IFAC, 2017). These various statements are included in an IR. A SoFP is widely known as a "financial snapshot", taken at a particular point in time, of all the company's assets and the claims against those assets (Higgins, 2012:6). Blessing and Onoja (2015:23) agree that a current or possible investor must examine the SoFP to assess the company's assets, liabilities and ownership equity at a specific point in time. The basic accounting equation reads as follows: assets – liabilities = equity (Higgins, 2012:6; International Accounting Standards Board, 2018).

If the SoFP is a snapshot, the SoCI and CFS can be considered as videos, indicating changes in two SoFPs over time (Higgins, 2012:8). Investors are logically interested in ways company operations would influence the value of their investment (Higgins, 2012:8). The SoCI assists by dividing perceived movements of owners' equity into revenues and expenses (Higgins, 2012:8). Investors will consider the SoCI to identify the company's "expense, income and profit or loss over a specified period of time" (Blessing & Onoja, 2015:23). Higgins (2012:8) explains that revenues, generated by sales, lead to an increase in owners' equity, whereas expenses, costs incurred to earn revenue, decrease the owner's equity. Earnings or net income entail

the net amount between revenues and expenses (Higgins, 2012:8). The CFS focuses on solvency, indicating changes in a company's cash balance annually (Higgins, 2012:8). The CFS analysis indicates the following aspects: how the company increased cash with the help of investors or creditors; how the cash is managed to obtain inventory and assets; how the inventory and assets help the company generate cash to settle operating expenses; and how the cash is repaid to investors and creditors (Blessing & Onoja, 2015:23). From the explanations above, it is evident that ratios in each of these statements have a different function to disclose the broader picture of the company.

Chen and Shimerda (1981:51) point out that different ratios are embraced by different researchers. The choice of financial ratios as elements to assess, is a challenge in most studies since ratios are likely to cover "overlapping information" (Pech, Noguera and White, 2015:580). Another challenge is identified by Oberholzer and Van der Westhuizen (2009:134) when they explain that different financial ratios may provide diverse answers about a company's performance. It would thus seem that ratios as assessing elements have a number of limitations. However, financial and accounting ratios continue to be a widely-used tool to evaluate companies' performance (Gouws & Lucouw, 1999:107). Regardless of the acknowledged limitations, ratios are considered to be a worthy indicator of financial performance, risk and growth. The following subsection investigates which ratios within the broader spectrum of financial ratios, should be analysed to determine the impact of IRG on the financial indicators of a company.

2.5.1 Financial ratios relevant to this study

The ratios appropriate to the present study are financial indicators relevant to the financial performance, risk and growth of a company. The importance of these three financial indicator categories was explained previously (see par. 2.3.1). Scholars however, have different outlooks on the classification of ratios as is explained below.

According to Peles and Schneller (1989:527), there are two categories of financial ratios. The first is SoFP ratios, derived from the relationships between different items (assets, liabilities and equity) found in a SoFP, which measures a company's financial position. The second category covers financial ratios that, not only weigh SoFP factors (Peles & Schneller, 1989:527). Such ratios also take into account items from the SoCI to measure a company's performance (Peles & Schneller, 1989:527). Delen *et al.* (2013:3970) found that text books on accounting and finance generally sort financial ratios into the following classes: liquidity, profitability, long-term solvency, and asset utilisation or turnover ratios. Myšková and Hájek (2017:97), in turn, categorise financial ratios in terms of the following indicators: productivity, profitability, cost, liquidity, solvency, capital structure, and capital market. Catty (2010:176-

178) states that the ratio analysis of financial statements includes the following elements: structures of assets and liabilities (operational gearing and financial leverage); capital structure (effect of financial leverage and debt analysis); balance sheet analysis (previous term for SoFP); cash flow as well as cost and profit.

Strouhal (2015:561) includes the following groups in his study: liquidity, profitability, asset management, debt and capital market ratios. Correia *et al.* (2015:5-16) acknowledge the same five classes of financial ratios but include cash flow ratios as a class. These ratio classes are discussed further in more detail:

a. liquidity (e.g. current and quick ratio);
b. profitability (e.g. net profit percentage, ROE and ROA);
c. cash flow (e.g. cashflow-to-debt and cashflow-per-share ratios);
d. asset management (e.g. inventory turnover and asset turnover);
e. debt management (e.g. debt and debt to equity ratio);
f. market value (e.g. price-earnings and earnings yield ratio).

a) Liquidity ratios

According to Cassim (2014:99), liquidity ratios, as specified by several authors, measure "whether a company can meet their short-term commitments in order to determine whether the company is monetarily safe". Delen *et al.* (2013:3970) further explain that liquidity ratios assess a company's ability to reconcile short-term debt, while long-term solvency ratios evaluate the risk for creditors considering to invest in the company. Therefore liquidity ratios will resort under the indicator of financial risk (for purposes of this study), seeing that these ratios imply any possible loss due to a lower actual result than anticipated.

However, for the present study, liquidity was excluded, for twofold reasons. Firstly, liquidity ratios focus on the short-term, and the main purpose of IRG is to explain how the company creates value over time (IIRC, 2013:7). The focus of sustainability is long-term, rather than short-term. Secondly, none of the previous studies examined the class of liquidity ratio as a financial indicator for IRG, which shows that these researchers also acknowledged the discrepancy between the short-term and longer term focus.

b) Profitability ratios

Profitability ratios measure a company's ability to generate a profit due to sales, equity, and assets (Delen *et al.*, 2013:3970). Cassim (2014:113) posits that the bottom-line of these ratios are to demonstrate the link between sales and recognised profit. Smart and Megginson (2008:54) explain profitability as "the most closely watched and widely quoted financial ratio".

This group of ratios is included in the indicator for financial performance since it measures the financial results in order to evaluate the financial well-being of a company.

c) Cash flow ratios

Loth (2018) explains that cash flow ratios illustrate "the cash being generated in terms of how much is being generated and the safety net that it provides to the company". This provides analysts a different angle at a company's financial well-being and performance (Loth, 2018). The reason is that the mentioned ratios can indicate the amount of cash companies obtained from their sales; income which accumulated freely and clearly, and which they require to pay obligations (Loth, 2018). Mills and Yamamura (1998) found that the two most valued groups of cash-flow ratios examine the solvency and liquidity of a company and determine its capability to continue as a going concern.

A drawback for the mentioned ratios, however, is the manipulation of operation cash flow ratios (Investopedia, 2018g). Companies may decrease their revenue figure with depreciating expenses even if it does not embody an actual outflow of cash (Investopedia, 2018g). Depreciation expense is an accounting figure: the value of assets should be decreased with the depreciation amount over the useful life of the asset (Investopedia, 2018g). As a result, "companies should add depreciation back to cash in cash flow from operations" (Investopedia, 2018g).

Companies can also manipulate their cash flow by prolonging the period to pay their debtors, or reduce the period in which they collect cash from debtors (Investopedia, 2018g). In addition, companies can prolong their payables to pay at a later stage, therefore sustaining their cash balance (Investopedia, 2018g). Likewise, if companies obtain cash from their receivables sooner, they increase their cash balance sooner rather than later (Investopedia, 2018g). Only one ratio were included in the ratio class of cash flow, 'Expected future cash flows'. This was done by one of the previous studies, which examined the impact of IRG on financial indicators (see Table 2.3).

Besides being susceptible to manipulation, this class is not included as part of the ratios tested in the present study since cash is accepted as a current asset. According to the International Federation of Accountants (IFAC, 2017:a928), cash or an equivalent is a current asset, except when the cash is limited from being traded or used to pay a liability not less than 12 months after the reporting period. Therefore cash is a short-term asset that will be utilised within 12 months. IRG, on the other hand, functions as a "force for sustainability" within companies, which implies a period longer than 12 months (IIRC, 2013:2).

d) Asset management ratios

From the literature it is clear that asset management ratios assess how effectively the company generates revenue by using its assets, the selling of its inventories and the collection of receivables (Delen *et al.*, 2013:3970). Correia *et al.* (2015) view asset management as a tool to determine whether the investment in assets can be justified compared to the sales revenue. Asset management ratios can be included in the two types of financial indicators applicable to the present study: either financial growth (how asset management increased), or financial performance (how asset management performed). Therefore this study included asset management ratios in both indicator categories.

e) Debt management ratios

Debt management ratios (also known as long-term solvency) concentrate on the ability of a company to pay the interest and principal portion on its long-term debt (Livingstone & Grossman, 2001:21). Delen *et al.* (2013:3970) point out that long-term solvency measure the risk of creditors. The following factors affect the risks of debt-finance: it includes interest and interest-rate risk – the borrower may be exposed to uncertain future interest-rates; securities offered – for non-payments, the lender may have a right to claim the asset(s) provided as security; and debt covenants – conditions included in a contract to reduce the risk for the creditor (Skae, Benade, Combrink, De Graaf, Jonker, Ndlovu, Nobatyi, Plant, Steyn & Steyn, 2017:397-398). Debt management ratios form part of the indicator categories for financial performance and financial risk. The mentioned ratios impact the financial performance of a company, seeing that the more debt, the more interest it will have to pay, which leads to lower financial performance. Debt management ratios are also part of the indicator category for financial risk, seeing that there is an inherent risk to debt finance – as explained above.

f) Market value ratios

Finally, market value ratios measure the value of a company's shares in relation to the shares of another company (Ehrhardt & Brigham, 2011:100). These ratios are also included under the indicator categories of financial performance and growth since it measure the market value to determine the financial well-being of the company; therefore these are included in both categories for the present study.

Selection of ratios

To ensure a complete assessment of the company's financial health, this study analysed financial ratios that cover most of the financial statements. As stated above, the focus was on ratio classes relevant to the categories of financial performance, growth and risk, excluding that of liquidity and cash flow.

The following key ratios were therefore selected as the financial indicators included in the categories of financial performance, growth and risk, for purposes of the present study. The three financial indicators mostly used in the previous studies were found to be market value of equity (7 studies); leverage (6 studies); and total assets (5 studies). Market value of equity was covered by examining the companies' figure for market capitalisation. Leverage and total assets were covered by the ratios for total asset turnover and debt to equity, selected in this study under the ratio class for asset and debt management. A more detailed description, including the reasons for selecting these ratios, are discussed in the paragraphs as indicated in Table 2.5.

Table 2.5 Ratios selected as financial indicators

Financial indicator category	Ratio class	Ratio
Financial performance (2.5.2)	Asset management	Inventory turnover
		Average debtors collection period
		Fixed-asset turnover
		Total asset turnover
	Debt management	Times interest earned (interest
		Earnings before interest, taxes,
		Fixed charge coverage
	Market ratios	Dividend yield
		Earnings yield
		Price-earnings
		Dividend cover
	Profitability	Gross profit %
		Net profit %
		EBITDA margin
		Net operating profit after tax
		Return on capital employed
		Return on invested capital
		Return on equity

Table 2.5 Ratios selected as financial indicators (continues)

Financial indicator category	Ratio class	Ratio
Financial risk (2.5.3)	Debt management	Debt ratio
		Debt to equity
		Times interest earned (interest
		EBITDA
		Fixed change coverage
Financial growth (2.5.4)	Asset management	Inventory turnover
		Average debtors collection period
		Fixed-asset turnover
		Total asset turnover
	Market ratios	Dividend yield
		Earnings yield
		Price-earnings
		Dividend cover
	Market valuation	Market capitalisation figure

Source: Own research

2.5.2 Financial performance ratios

Asset management

Inventory turnover

Formula 1: Inventory turnover = Cost of sales/Average inventory balance

Service (2018:1282), Das (2010:14) and Tuvadaratragool (2013:84) explain that the above-mentioned ratio indicates how quickly inventory is sold (turned over) during a specific period. A low turnover can indicate obsolete inventory or overstocking (Service, 2018:1282). According to Cassim (2014:76), low turnover could indicate accumulation of the inventory to prepare for possible material shortages. A high turnover could be a sign of understocking and extensive liquidity (Cassim, 2014:75).

There are more than one definition for the inventory turnover ratio based on the following formula: Sales divided by ending inventory and cost of goods sold divided by average inventory (Higgins, 2012:44). Higgins (2012:44) and Ehrhardt and Brigham (2011:92) argue that cost of sold goods is a more suitable numerator than sales, seeing that the latter include a profit mark-up that is excluded from inventory. Therefore, in the present study, cost of sales

was used as the numerator. The inventory turnover ratio was examined seeing that it indicates how the company manages its inventory, an important asset for firms.

Average debtors collection period

Formula 2: Average debtors collection period = Average debtors balance/Credit sales per day

This ratio indicates the management of a company's receivable accounts (Higgins, 2012:44). According to Das (2010:14), this ratio highlights how fast debts are incurred. Ehrhardt and Brigham (2011:93) explain that the mentioned ratio is used to evaluate receivable accounts in terms of the number of days' sales tied up in receivables. The latter is obtained by dividing receivable accounts by average daily credit sales Ehrhardt and Brigham (2011:93). This calculation indicates the average amount of time a company will have to wait after the sale occurs before receiving the cash, or the time lag that customers are granted before paying for goods purchased from a sale (Ehrhardt & Brigham, 2011:93).

A high ratio indicates a shorter period between the sales and cash collection (Cassim, 2014; Das, 2010:14). Credit sales are used as the denominator rather than net sales since only credit sales will lead to receivable accounts (Higgins, 2012:44). Higgins (2012:44) makes the following calculation: "Credit sales for the accounting period divided by the number of days in the accounting period," which for yearly financial statements is understandably 365 days. Therefore credit sales per day can be used as the denominator. Average debtors collection period provides a better explanation than a simple asset turnover ratio of receivable accounts (credit sales/ receivable accounts) since it signals a company's collection period in terms of the sale (Higgins, 2012:45). For this reason, it can be posited that this ratio is important to examine as faster collection of cash is preferable for any company.

Fixed-asset turnover

Formula 3: Fixed-asset turnover = Sales/Net fixed assets

This ratio measures how productive property, plant and equipment are utilised in a business. Significant investments in longstanding assets are necessary for capital intensive companies or industries to produce their goods (Higgins, 2012:46). Capital intensive organisations are particularly sensitive to the state of the economy, seeing that the majority of their costs are fixed. This means these companies thrive during affluent periods when sales increase in relation to costs, but struggle in a weak economy (Higgins, 2012:47).

Higgins (2012:47) points out that the fixed-asset turnover ratio measures capital intensity, with low sales suggesting high intensity of capital. When a company has a high fixed-asset turnover compared to others in its industry, this company is generating a large amount of sales from its

asset base and may need to acquire more assets to increase sales (Moles, Parrino & Kidwell, 2011:127). Ehrhardt and Brigham (2011:94), Megginson, Smart and Graham (2010:43) as well as Moles *et al.* (2011:127-128) state that this ratio of sales to net fixed assets is a measure of how resourcefully a company utilises its plant and equipment to generate a turnover.

Creditors are interested in the ratio of fixed-asset turnover, which indicates capital intensity as it signals the basic business risks that a company face (Higgins, 2012:47). However, when interpreting this ratio, a potential problem may emerge (Ehrhardt & Brigham, 2011:94). From accounting it is common knowledge that fixed assets are measured in terms of the historical costs (Ehrhardt & Brigham, 2011:94). The current value of assets purchased in the past can therefore be extremely understated due to inflation (Ehrhardt & Brigham, 2011:94). This condition must be considered when comparing a company which a long time ago have purchased several of its fixed assets at lower prices, to a company that had only lately procured its fixed assets (Ehrhardt & Brigham, 2011:94). The company that purchased its assets years ago would probably show the higher turnover ratio of fixed assets (Ehrhardt & Brigham, 2011:94). This would be more indicative of the trouble accountants have with inflation than because of the company's ineffective managing of more recent assets (Ehrhardt & Brigham, 2011:94). The present study avoided this potential problem when evaluating the turnover ratio of fixed assets. The reason is that this ratio was evaluated as part of three others to conclude on the way the company manages its assets.

Total asset turnover

Formula 4: Total asset turnover = Sales/Total assets

The total asset turnover ratio specifies the efficiency of a company when consuming all their assets by generating sales (Cassim, 2014:76). According to Robbetze (2015:35), shareholders value this mentioned ratio as it highlights whether the assets are utilised efficiently with the aim of generating sales. Cassim (2014:76) and Megginson *et al.* (2010:43) explain that analysts prefer a higher ratio, which indicates that investors can foresee more cash flow due to increased sales created by the company. Moles *et al.* (2011:127) point out that a higher ratio commonly indicates more effective managing by using total assets. A lower ratio of total asset turnover can point to either the ineffective usage of assets, or the need to sell assets (Cassim, 2014:171). Marx (2017:134) explained that this outcome may be due to surplus capacity or disruptions in the sourcing of raw materials.

Megginson *et al.* (2010:43) advise that analysts of this ratio should again be aware that the latter uses the historical costs of fixed assets. Certain companies may have considerably more recent or outdated assets compared to other companies, therefore their assets may be depreciated less (recent assets) or more (outdated assets) fully (Megginson *et al.*, 2010:43).

Companies with more recent assets often have lower turnovers, seeing that these assets do not include a significant depreciation figure, thus leading to a higher denominator amount (Megginson *et al.*, 2010:43). On the other hand, seemingly the ratio of companies with older assets can be viewed as more favourable, but this may be due merely to fuller or further depreciated assets.

Correia *et al.* (2015:5-19) also caution analysts to consider the matching of asset acquisitions and revenue. Such consideration is, however, not always possible since revenue and asset acquisitions often occur at different times during a year Correia *et al.* (2015:5-19). For example, sales are generated throughout the year, but an asset could be acquired on any specific date during the year, therefore influencing the ratio on this date during the current year (Correia *et al.* (2015:5-19).

To recap: The two potential problems that can occur is firstly, due to outdated as opposed to more recent assets, and secondly the discrepancy in timing of asset acquisitions and revenue creation. As corrective, it is proposed that this ratio should be considered in conjunction with other ratios for asset management. The asset-turnover ratio will then help indicate how effective a company manages its assets.

Debt management

Times interest earned (interest cover)

Formula 5: Times interest earned (interest cover) = EBIT/Interest

The above-mentioned ratio is calculated by dividing earnings before interest and tax (EBIT), by interest and indicates how many times interest can be repaid (Cassim, 2014:73). Cassim (2014:73) points out that the higher the ratio, the stronger the company's ability to pay interest. According to Correia *et al.* (2015:5-21), this ratio measures the amount that earnings can decrease before causing a financial loss for the firm. Ehrhardt and Brigham (2011:197) emphasise that the interest cover ratio are particularly valuable to foresee and deal with financial distress. Therefore, this ratio will be an excellent indicator of whether companies can manage their debt since interest is incurred on debt.

EBITDA

Formula 6: EBITDA = Earnings before interest, taxes, depreciation, and amortisation

EBITDA refers to net sales minus operating costs but excluding depreciation and amortisation, in other words earnings before interest, taxes, depreciation, and amortisation (Ehrhardt & Brigham, 2011:52). Depreciation and amortisation are deducted from the estimated costs of tangible (e.g. plant and equipment) and intangible assets (e.g. copyrights, goodwill, patents

and trademarks) as the assets are utilised each year (Ehrhardt & Brigham, 2011:52-53). Certain analysts consider EBITDA as a more preferable measure of financial strength than net income, seeing that depreciation and amortisation is not paid in cash (Ehrhardt & Brigham, 2011:53). Moles *et al.* (2011:86-87) point out that analysts frequently use this ratio in order to obtain a correct as possible estimate of a company's performance. Although EBITDA is useful when comparing companies where the age of assets are different, it should be noted that it does not give a true reflection of a company's profitability.

Higgins (2012:15) mentions that EBITDA are commonly used in certain industries, for example, broadcasting, seeing that depreciation charges may regularly overstate the actual economic depreciation. It has been stated that EBITDA actually stands for "earnings before anything bad happens" (Ehrhardt & Brigham, 2011:53). Warren Buffett noted, as mentioned by Higgins (2012:15), that EBITDA is a ratio which investment bankers prefer when the usage of earnings before interest and taxes cannot justify a deal. Moles *et al.* (2011:132) point out that several share analysts are concerned with the generation of cash flow due to operations rather than operating earnings and will use EBITDA rather than EBIT.

From the discussion above, it can be posited that this ratio is important when analysing debt management since EBITDA point to the earnings that are available to cover interest and debt.

Fixed charge coverage

Formula 7: Fixed charge coverage = (EBIT + lease payments)/(lease payments + interest)

Investopedia (2018d) views the above-mentioned ratio as a measurement tool to determine a company's capacity to satisfy fixed charges, for example, interest and lease expenses. Fixed charges are expenses relating to debt (e.g. interest expense) or debt-like instruments (e.g. lease payments) (Investopedia, 2018d). This calculation, assessing the capacity of a company to cover fixed charges, includes the following elements: EBIT, interest expense, lease expense and other fixed charges (Investopedia, 2018d). BusinessDictionary (2018d) and Investopedia (2018d) maintain that the objective of covering fixed charges is to specify the frequency in which the interest (on long-term debt and bonds) and lease expenses of a company can be covered by its earnings (revenue). This ratio forms part of cover ratios utilised to assess the sensitivity of a company's profits to external factors (Swanepoel, 2018:63). Therefore the ratio of fixed charge coverage helps evaluate the sensitivity of income as a risk indicator (Swanepoel, 2018:63), as well as the relative safety of a company's profits (Swanepoel, 2018:63). Sensitivity ratios will indicate to stakeholders the possible risk of a company failing to declare dividends or to pay interest (Swanepoel, 2018:63).

The mentioned ratio shows the available margin of safety since non-payment of interest would lead to a default in the bond agreement (BusinessDictionary, 2018d). A low ratio indicates a

decrease in earnings that could place the company in a difficult position – a situation lenders try to avoid (Investopedia, 2018d). On the other hand, if the ratio is too high, indicating too much safety, it may point towards an unwanted low level of leverage (BusinessDictionary, 2018d).

The ratio for fixed charge coverage is typically frequented by lenders who investigate the available amount of cash flow a company has available for debt repayment, in order to assess the company's ability to increase its current debt (Investopedia, 2018d). A company that can cover its fixed charges faster in comparison with other companies, is not only considered as more proficient, but also more profitable (Investopedia, 2018d). Such a company is viewed as an enterprise that wishes to borrow for development and growth rather than being in need due to difficult financial circumstances (Investopedia, 2018d). This ratio was evaluated to measure the trends in the companies' ability to pay their fixed charges.

Market ratios

Dividend yield

Formula 8: Dividend yield = Dividend per share/Market price per share

Megginson *et al.* (2010:481) point out that the dividend yield is one of the ratios that investors examine closely to ascertain companies' dividend payments. The dividend yield is a ratio of the annual cash dividend in relation to the current share price (Megginson *et al.*, 2010:481). According to Correia *et al.* (2015:5-26), this ratio points toward the return an investor receives on the investment by way of a dividend. The current norm on the JSE for total dividend yield is between 2-3% (Correia *et al.*, 2015:5-26), whereas the value of dividends can be specified by variations in dividend yields over time (Correia *et al.*, 2015:16-25). Moles *et al.* (2011:332) explain that investors will consent to accept low or no dividend payments if they are able to anticipate higher dividends or share prices in future. This ratio was investigated to determine the trends in dividend pay-outs, compared to market value.

Earnings yield

Formula 9: Earnings yield = Earnings per share/Market price per share

The earnings yield ratio indicates earnings as a percentage of each 1 dollar, pound, rand, et cetera, invested in a company (Service, 2018:1279). Kennon (2010) explains that the earnings yield ratio ultimately conveys the following message, "If this stock were a bond, how much would it earn as a percentage of my investment based on this year's after-tax profits?" Earnings yield points toward the yield that shareholders demand. This ratio is viewed as the inverse of the above-mentioned price-earnings ratio (Kennon, 2010).

Higgins (2012:56), however, doubts that earnings yield is a useful measurement of financial performance. He explains that a company's share price is highly sensitive to investors' prospects about the future Higgins (2012:56). Since investors have shares in a company, they have a right to a portion of future and present earnings (Higgins, 2012:56). Naturally, investors will pay more for shares the higher they expect the future earnings to be (Higgins, 2012:56). Therefore, an optimistic forecast will lead to a higher share price and a lower earnings yield (Higgins, 2012:56). This means a higher earnings yield is not always an indicator of improved performance, but may in fact point to the opposite (Higgins, 2012:56).

Price-earnings ratio

Formula 10: Price-earnings ratio = Market price per share/Earnings per share

The price-earnings ratio indicates the amount that investors are prepared to pay for reported profits (Correia *et al.*, 2015; Higgins, 2012:1104). Higgins (2012:57) explains that a company's price-earnings ratio depends mainly on forecasts of its future earnings and the risk related to those earnings. He elaborates: "Stock price, and hence the price-earnings ratio, rises with improved earnings prospects and falls with increasing risk" (Higgins, 2012:57). A lower price-earnings ratio would usually points toward greater risk for the company (Correia *et al.*, 2015:5-26).

Trevino and Robertson (2002:83-84) emphasise the importance of this ratio. According to them it will be an oversight if investors are not investing in shares when the ratio of price-earnings is high (Trevino and Robertson, 2002:83-84). Gibson (1987:74) conducted a survey amongst proficient financial analysts and established that the price-earnings ratio received the "second-highest significance rating" after the profitability ratio – ROE (Formula 18 of the present study).

Pech *et al.* (2015:580) report that Matsumoto, Shivaswamy and Hoban Jr, (1995) surveyed security analysts, asking the latter to rate the usefulness of several financial ratios. Matsumoto *et al.* (1995:47) found that price-earnings is one of the most useful ratios. This ratio is part of the most preferred multiples for valuation ratios (Pech *et al.*, 2015:587). Trevino and Robertson (2002:83-84) concur since they found that the price-earnings ratio is useful in estimating long-term average returns.

Beidleman (1971:86), however, points out that, apart from rare or artificial limiting instances, an increase in share value does not correlate with higher earnings. From her study, it can be inferred that the price-earnings ratio does not always correlate unambiguously with the level of future performance Beidleman (1971:86). This condition once again emphasises the importance of ratios in combination and not in silos. In the present study, the earnings yield was considered alongside other ratios to evaluate the market ratios of a company.

Dividend cover

Formula 11: Dividend cover = Net earnings/Dividend

This ratio of dividend cover applies to all investors but is particularly important for preference shareholders (Borad, 2018). This type of shareholders have a favoured right to obtain dividends over normal equity shareholders (Borad, 2018). Management can decide whether to pay a dividend to ordinary shareholders, however the dividend to pay preference shareholders is compulsory (Borad, 2018). Preference shareholders will get paid before any other shareholder receives a dividend (Borad, 2018). The pay-out of a dividend can be deferred to a later stage but must be paid at some stage, therefore it is considered as a fixed liability (Borad, 2018).

This ratio is calculated as net earnings/dividend (Borad, 2018). Net earnings is calculated after all expenses have been subtracted, including the taxes (Borad, 2018). Dividends related to preference shares implies a fixed liability, not charged to profits of a company but considered as the distribution of profits (Borad, 2018). The dividend used as denominator is the amount that preference shareholders is entitled to receive (Borad, 2018).

To recap, the ratio of dividend cover essentially calculates the capability of a company to pay a dividend (Borad, 2018; BusinessDictionary, 2018a). A higher dividend cover indicates a greater likelihood of earning a dividend (BusinessDictionary, 2018a). Investopedia (2018h) maintains that a company in a healthy financial position will have a high coverage ratio, which indicates that it is not that difficult to pay off its dividend requirements. On the other hand, a company in a financially less healthy position, will indicate a lower ratio, seeing that less funds are available to make the necessary dividend payments (Investopedia, 2018h). Normally, this ratio is calculated especially for preference shareholders (Borad, 2018).

Profitability

Gross profit %

Formula 12: Gross profit % = Sales minus cost of goods sold/Sales

Megginson *et al.* (2010:45) go as far as to suggest that profitability ratios are some of the most closely analysed and extensively quoted financial ratios. Such a profitability ratio in particular is also called the gross margin ratio (Marx, 2017:137). The gross profit margin identifies the gross profit per dollar (or pound, rand, etc.) of sales before other expenses are deducted (Ehrhardt & Brigham, 2011:98; Megginson *et al.*, 2010). Livingstone and Grossman (2001:5) stipulate that gross profit represents the sales minus the amount that suppliers charged the company for the sold goods. Therefore, the ratio reflects the mark-up from the cost the company have paid for the goods to its selling price of the goods (Livingstone &

Grossman, 2001:5). 'Gross' means before deductions and in this case it is income before deducting operating expenses (Livingstone & Grossman, 2001:5). A low ratio may represent the incapability of a company to manage its production costs (Marx, 2017:137). In the words of Megginson *et al.* (2010:45), the "higher the gross profit margin, the better".

By analysing profitability, it is worth-while to separate variable costs and fixed costs (Higgins, 2012:41). Variable costs will change according to changes in sales, whereas fixed costs continue to be constant (Higgins, 2012:41). Firms with a higher percentage of fixed costs are more exposed to a decrease in sales since they are unable to reduce fixed costs when sales decrease (Higgins, 2012:41). The SoCI does not distinguish fixed from variable costs (Higgins, 2012:41). However, there is an assumption that costs of sold goods mostly consist of variable expenses, whereas most other operating costs are viewed as fixed (Higgins, 2012:41). The gross margin as far as possible allows differentiation between fixed and variable costs (Higgins, 2012:41). The gross margin is often used to highlight the sales volume where a company breaks even (Higgins, 2012:41).

According to Marx (2017:137) this ratio can be a valuable "benchmark against competitors". The ratio provides evidence of the company's pricing, the structure of costs, and the effectiveness of production (Marx, 2017:137). Petty, Keown, Scott and Martine, (1993:59) further explain that this ratio reflects the ability of management to minimise the cost of goods sold relative to its sales.

Net profit %

Formula 13: Net profit % = Net income/Sales

'Net' in accounting means 'after deductions' (Livingstone & Grossman, 2001:5). Therefore, net income represents income after deducting income taxes and operating expenses (Livingstone & Grossman, 2001:5). Megginson *et al.* (2010:45) and Cassim (2014:77) explain that such a profitability ratio measures the percentage per currency remaining after deducting all expenses and costs such as interest, taxes, and preferred share dividends. The net profit is calculated as earnings available for ordinary shareholders over sales (Megginson *et al.*, 2010:45). From a different angle, Cassim (2014:77) and Petty *et al.* (1993:60) calculated net profit as net income divided by sales. Correia *et al.* (2015:5-22) point out that the net profit margin can be communicated as net profit after interest and tax/sales.

According to Cassim (2014:168), a higher ratio is preferable since it indicates that a company manages its sales effectively in relation to its expenses. A higher ratio implies a higher profit and an improved safety margin (Cassim, 2014:173). This second profitability ratio was therefore analysed to examine the trends of companies managing their expenses.

EBITDA margin

Formula 14: EBITDA margin = Operating income (EBIT) after depreciation and amortisation/ Total revenue

Moles *et al.* (2011:86-87) point out that analysts often examine EBITDA to get an uninfluenced evaluation of a company's performance. Correia *et al.* (2015:5-21) explain that the coverage ratio of EBITDA is calculated as EBIT after depreciation and amortisation, which are two non-cash flow charges. This figure – earnings before interest, tax, depreciation and amortisation – is not indicated on the SoCI, but can be calculated with little effort by adding back the interest and taxation expense, depreciation and amortisation (Moles *et al.*, 2011:87).

This ratio provides a better conclusion, namely that interest payments are covered by an amount that is closer to cash flow from operations, instead of examining only the coverage using earnings (Correia *et al.*, 2015:5-21). Moles *et al.* (2011:132 & 459) and Ehrhardt and Brigham (2011:53) point out that numerous share analysts are more interested in cash flows created by operations rather than earnings as such. Therefore, they will apply EBITDA (also known as pre-tax operating cash-flow) as replacement for EBIT as the numerator. Investopedia (2018a) adds that EBITDA measures the profitability of a company before deductions that, to a certain degree, are viewed as redundant to business decisions. The deductions of interest, tax, depreciation, and amortisation are not part of the operating costs and thus not related to the daily maintenance and administration of a company (Investopedia, 2018a).

The EBITDA margin in particular assesses a company's operating profitability in proportion to its total revenue (Investopedia, 2018a). This margin is a valuable measurement tool to compare the profitability of various companies while excluding the impacts of decisions linked to "financing and accounting" (Investopedia, 2018a). The EBITDA margin helps assess whether a company has cut its costs (Investopedia, 2018a). The higher the EBITDA margin, the lower the operating expenses as a percentage of the total revenue (Investopedia, 2018a).

The mentioned ratio measures operating profit as a percentage of revenue, therefore allowing analysts to compare companies of different sizes in various industries (Investopedia, 2018a). The EBITDA margin can be used as a comparative benchmark since it indicates the amount of operating cash created for each currency of obtained revenue (Investopedia, 2018a).

Furthermore, it is noticeable that exclusion of debt has its disadvantages when measuring a company's performance (Investopedia, 2018a). Companies may mislead analysts by using the EBITDA margin to enhance the view on its financial performance (Investopedia, 2018a). Analysts should be aware of companies with high debt since a larger mix of debt to equity leads to an increase in interest payments, which will not be considered by EBITDA

(Investopedia, 2018a). Keeping this in mind, the mentioned ratio permits analysts to make educated business decisions by comparing the operating profit as a percentage of revenue across companies (Investopedia, 2018a). In addition, the effects of debt and interest were considered when analysing, for example, the interest cover ratio.

Net operating profit after tax (NOPAT)

Formula 15: *Net operating profit after tax = EBIT(1 − Tax rate)*

NOPAT is a further option to determine earnings and is theoretically the most correct approach (Correia *et al.*, 2015:5-23). Interest, a cost of financing is excluded, but tax is included since it is an operating cost (Correia *et al.*, 2015:5-23). Ehrhardt and Brigham (2011:1102) point out that a company would profit if it had no debt or financial assets. Investopedia (2018f) views NOPAT as the potential cash earnings of a company if it had no debt. NOPAT is often used to calculate economic value added (EVA) (Investopedia, 2018f). NOPAT is a more correct indicator to determine efficiency of operations for leveraged companies, and it excludes the tax savings of several companies due to current debt (Investopedia, 2018f). Furthermore, companies able to defer the payment of some of their taxes, should adjust NOPAT to mirror the taxes actually paid by a company due to its operating income (Ehrhardt & Brigham, 2011:59).

Companies with various levels of debt and therefore different interest expenses, may have the same operating performances but their net incomes differ (Ehrhardt & Brigham, 2011:59). This is because the company with less debt would have a higher net income (Ehrhardt & Brigham, 2011:59). According to Ehrhardt and Brigham (2011:59), even if net income is undoubtedly important, in certain instances it may not reflect the proper performance of the operations of a company or the efficiency of its operating management. To these scholars, NOPAT is a more effective measurement tool to analyse management's performance (Ehrhardt & Brigham, 2011:59).

Investopedia (2018f) calculates NOPAT as operating income x (1 – tax rate). Ehrhardt and Brigham (2011:59) define NOPAT as EBIT x (1 − tax rate). However, for companies with a more complex tax situation, NOPAT should rather be calculated in terms of this formula: "(net income before preferred dividends) + (net interest expense)*(1 − tax rate)" (Ehrhardt & Brigham, 2011:59). For the present study, EBIT was used in the formula above as the one available on IRESS from which the data were collected.

Return on capital employed (ROCE)

Formula 16: Return on capital employed = NOPAT/Net operating assets

Traditionally, accounting ratios such as ROCE are used to calculate the extent of a company's performance (Collier, 2015:14). ROCE is an indicator of the profitability of a company on capital investments. In this regard, the acceptable norm is that the cost of borrowing should at least be smaller than the ROCE (Nasdaq, 2018). The BusinessDictionary (2018e) explains that ROCE measures capital investments' profitability and efficiency. According to Ehrhardt and Brigham (2011:658), if a company keeps more cash than necessary to maintain its operations, its return on invested capital will decrease due to cash that earn a low rate of return. On the other side of the coin, if a company is in need of cash, then it may point to financial distress if there is an unforeseen decline in business (Ehrhardt & Brigham, 2011:658). Robbetze (2015:33) concludes that ROCE is a measurement type of profitability by "comparing earnings that arise from capital employed by capital invested".

Correia *et al.* (2015:5-23) explain that this ratio is also known as return on invested capital or return on net assets. The nominator and denominator for this ratio can be calculated in several ways. Nasdaq (2018), for example, calculates it as dividing "earnings before interest and taxes by capital employed plus short-term loans minus intangible assets". Regarding the denominator, Correia *et al.* (2015:5-23) point out that it may be more valuable to calculate the return on net operating assets (i.e. total assets less current liabilities, thus eliminating short-term debt) according to this ratio. Capital employed can be defined as the long-term capital obtained to finance operations, in other words, "long term debt plus equity or total assets less current liabilities" (Correia et al., 2015:5-23, 5-24). Current liabilities usually exclude short-term debt (Correia et al., 2015:5-23, 5-24). Another definition of capital employed or net operating assets is working capital plus fixed assets (Correia *et al.*, 2015:5-24).

When considering the numerator, Correia *et al.* (2015:5-23) postulates that the definitions of earnings will depend on the objective of the analyst. EBIAT may be used for comparing companies in diverse tax circumstances and various degrees of financial leverage (Correia *et al.*, 2015:5-23). Net profit after interest and tax can also be used, but may understate the return as the after-tax cost of debt finance remains included (Correia *et al.*, 2015:5-23). As explained in formula 15, NOPAT is a further option and is in theory the most accurate approach (Correia *et al.*, 2015:5-23). Interest - a cost of financing - is excluded, but tax is included since the latter is an operating cost (Correia *et al.*, 2015:5-23). Correia *et al.* (2015:5-24) concludes that in terms of evaluating value creation, NOPAT should be divided by net operating assets to determine ROCE. This was therefore the denominator and numerator selected for the present study.

Return on invested capital (ROIC)

Formula 17: Return on invested capital = NOPAT/Operating capital

To compute the ROIC, analysts have to calculate both the NOPAT and operating capital figures. Ehrhardt and Brigham (2011:66) describe ROIC as the ratio to determine the profitability of a company's growth. ROIC is a performance measure that stipulates the relationship indicating how much NOPAT one dollar of operating capital can create (Ehrhardt & Brigham, 2011:66).

Ehrhardt and Brigham (2011:66) continue to explain that if the ROIC surpasses the rate of return required by investors (the weighted average cost of capital – WACC), then a company is adding value to investors. Correia *et al.* (2015:5-24) emphasise that investors must take care to use the average invested capital if there has been a significant movement in such capital from one year to another. This performance measure was evaluated in the present study to measure the profitability that a company has for its investors.

Return on equity

Formula 18: Return on equity = Net income/Total equity

According to Higgins (2012:38), the ROE is easily the most popular measuring tool preferred by investors and senior management to determine a company's financial performance. In this regard, Monteiro (2006:9) confirms that ROE is possibly the most significant ratio to an investor, and Rappaport (1986:31) points out that ROE has been cited as one of the most valuable measures of the performance of a company.

The mentioned ratio demonstrates the shareholder's share of a company's profit (Service, 2018:1277). Damodaran (2007:11) stresses that ROE measures the return on only the equity element of the investment. The reason is that this ratio refers to the earnings remaining for equity investors after taking into account the debt service costs on the invested equity (Damodaran, 2007:11). Smart and Megginson (2008:55) posit that if a company merely uses common shares to fund its operations, the ROA and ROE ratios are similar. However, if the SoFP of the company includes debt or preferred shares on the SoFP, these ratios generally will vary (Smart & Megginson, 2008:55).

Oberholzer (2012:425) concludes in his study that ROE is a sensible tool to indicate the complete performance of companies, which he views as "the relative efficiency with which to create shareholders' wealth". The ROE highlights the state of the shareholders' investment: a decline in the ratio could point to an increase in cost, therefore a decrease in the return that shareholders or investors can receive on their investments (Cassim, 2014:114). Cassim (2014:114) elaborates that it is evident, if this ratio increases, it would be because the

company has given the investor larger profit per rand. ROE essentially determines how effective the funds of the company are being utilised to generate a return on the shareholders' investment (Cassim, 2014:114).

In contrast, Robbetze (2015:39) points out that several researchers are not keen on using this ratio to determine shareholder wealth. There are several reasons for this reluctance: the ratio relates poorly to shareholders' return, or can be manipulated without difficulty Robbetze (2015:39). In the same vein, Damodaran (2007:12) cautions that a large number of companies may obtain negative book values for equity that will turn the ROE into a worthless number.

2.5.3 Financial risk ratios

Debt management

Debt ratio

Formula 19: Debt ratio = Total debt:Total assets

The debt ratio specifies how much of the assets are financed not internally, but externally (Service, 2018:1283). Cassim (2014:142) posits that the debt ratio calculates the percentage of the assets that have been paid for by using debt and how dependent a firm is on borrowings to finance its operations. It signals a "company's debt financing structure" (Cassim, 2014:143). From their side, Ehrhardt and Brigham (2011:95) explain that this ratio measures the proportion of funds provided by current and long-term liabilities.

Correia *et al.* (2015:5-20) point out that a higher debt ratio leads to higher financial risk. Cassim (2014:143) mentions that investors favour a low ratio, seeing that a high ratio points toward substantial borrowings. Debt can, however, be seen as either a blessing, or a burden (Livingstone & Grossman, 2001:25). Livingstone and Grossman (2001:25) explain that the obligations accompanying long-term debt are a *burden* when a company's income are low or absent. However, in affluent financial times, long-term debt obligations are a *blessing* since the debt provider only receives fixed payments (Livingstone & Grossman, 2001:25).

Ehrhardt and Brigham (2011:197) argue that although several ratios can be viewed as important, the debt ratio is valued primarily for pointing out possible financial distress. A high debt ratio may signal the threat of bankruptcy, which not only carries a cost, but also indicates that management should work more cautious and less inefficient with the money of shareholders (Ehrhardt & Brigham, 2011:631).

Creditors have a preference to low debt ratios, seeing that the lower the ratio, the less the risk of losing their money in the event of liquidation (Ehrhardt & Brigham, 2011:95). Shareholders, however, may want more leverage as a higher debt ratio enlarges their return (Ehrhardt & Brigham, 2011:95).

From the discussion above, it can be concluded that debt is a valuable ratio to various analysts, by indicating a company's dependency on borrowing from third parties.

Debt to equity

Formula 20: Debt to equity = Total debt/Total equity

The above-mentioned ratio is also known as the debt ratio, leverage ratio, or financial leverage ratio (Marx, 2017:136). The book, 'Gripping GAAP' (Service, 2018:1284) explained that this ratio specifies the value of a company's finance or funding, which is internal (equity) as opposed to external (debt). Marx (2017:136) concurs that this ratio points to the degree that companies rely on financing through debt. Thus, debt to equity measures medium financial risk, by determining the extent to which shareholders' funds cover debt (Correia *et al.*, 2015:5-20). The higher the ratio of long-term debt to equity, the more leveraged a company is (Livingstone & Grossman, 2001:25). The more leveraged a company is considered to be, the more shareholders will thrive in affluent times and the worse they will manage in challenging times (Livingstone & Grossman, 2001:25).

Current and potential investors closely examine the mentioned ratio since companies have to pay creditors before they can pay out dividends to shareholders (Megginson *et al.*, 2010:43). Therefore the higher the ratio, the greater the risk the company takes (Cassim, 2014:73), seeing that it would be difficult to pay the interest and capital, while seeking more funding (Marx, 2017:136). Below a ratio of 2:1 is considered as acceptable with no more than one-third of long-term debt (Marx, 2017:136). According to this ratio, the total debt of a company can be compared with its total equity. This ratio was compared to previous years, in order to evaluate the debt management of the company under research.

The times interest earned, EBITDA and fixed charge coverage ratios resort under the ratio class of asset management as well as within the indicator category of financial performance. Thus, these ratios were explained already under par. 2.5.2. These three ratios are however also included within the indicator of financial risk, which were explained in this paragraph. Seeing that these three ratios were explained already in par. 2.5.2 this will suffice for the present study.

2.5.4 Financial growth ratios

As indicated in Table 2.5 above, the four ratios included in the class of asset management and the four ratios that resort under the market ratio class are part of the financial performance as well as the financial growth indicator categories. These ratios were explicated already under par. 2.5.2, and will not be discussed again.

Market valuation

Market capitalisation

The above-mentioned figure refers to the fair value of all the equity and is basically calculated using the following formula (Skae *et al.*, 2017:415):

*Formula 21: Market capitalisation = Price per share (quoted on Securities Exchange) * Number of group shares in issue*

Market capitalisation indicates the total currency in market value of the outstanding shares of a company (Investopedia, 2018e). Investopedia (2018e) explains that this figure is reached by multiplying these mentioned outstanding shares by the current market price of a single share. Investors examine this figure to draw conclusions about the company's size as an alternative method to using sales or the total asset figures (Investopedia, 2018e).

In conclusion, the 20 ratios were explicated above as well as the market capitalisation figure. All these components were analysed as financial indicators of a company's performance, risk and growth. These are considered as the most popular ratios that stakeholders use when evaluating companies. The explicated ratios also covered the gap not yet examined by empirical research on the impact IRG has on financial indicators. Only three of the ratios used in the 11 previous studies (net operating profit after tax, return on equity and debt ratio) were also examined in the present study. All the other ratios that were evaluated, were not covered by previous research. Another noteworthy fact is that seven of the 11 previous studies investigated correlations between the ratios and IRG, whereas only four (studies 1, 2, 3 and 7) of these 11 studies examined the relationship between the ratios and IRG strength, as the present study did. Study 1 of the reviewed literature, also used the EIRAs to construct the proxy for their IR quality, which was also done in this study.

The following paragraph explicates EY's EIRAs. First an overview is given, after which the awards and the adjudication process are explained.

2.6 EXPLANATION OF EY's 'EXCELLENCE IN INTEGRATED REPORTING AWARDS'

EY celebrated 21 years of "Excellence in Reporting" in 2018 (EY, 2018:2). Their awards have kept up with the journey to IRG by moving from evaluating corporate reporting, to sustainability reporting, and currently IRG (EY, 2018:2). The intention of these awards is to inspire companies to provide quality IRs as the awards are applied as a measurement tool to evaluate the quality of IRG for all stakeholders from South Africa's listed companies (EY, 2018). Larissa Clark, Professional Practice Director of EY emphasised the following at the 2018 EIRAs on 3 August 2018 (Clark, 2018):

> Following a volatile year of business uncertainty, the need for building trust and confidence in South Africa's capital markets is a key priority for business and the future prosperity of the country. We believe that EY's Excellence in Integrated Reporting survey and awards play an important role in restoring trust by identifying best practice and standards of excellence for integrated reporting among listed companies.

Since 2012, EY's reporting awards specifically evaluated the quality of IRs of South Africa's top companies (EY, 2018). The companies that are evaluated annually are the top 100 JSE-listed ones, based on their market capitalisation on 31 December or the last working day of the previous year, e.g. 31 December 2017 for the 2018 EIRAs (EY, 2018:13). For these awards, 100% holding companies are omitted, whereas dual-listed companies are included (EY, 2018:17). For the 2018 EIRAs, the IR or annual report for the year ended on or before 31 December 2017 of the selected companies were evaluated (EY, 2018:13). EY does not disclose the final scores of the companies' adjudicated reports, instead it categorises the companies into one of four classes: 'Excellent', 'Good', 'Average' or 'Poor' (EY, 2018:5). Companies that increasingly show a stronger adherence to the journey towards quality IRGs, are ranked as 'Excellent' or 'Good' (EY, 2018:5).

The 2018 EIRAs were adjudicated and ranked by three esteemed scholars all specialising in financial reporting and functioning independent of EY (EY, 2018). The three adjudicators were the same for all four sampled years. According to Graham (2018), one of the adjudicators, the mark plan has changed annually as more knowledge and clarity about IRG are obtained. Before the IIRF was issued, markers used their own mark plan based on the IRC of SA's draft framework (Graham, 2018). Since the IIRF was issued only at the end of 2013, the mark plan of the 2012 EIRAs was developed by studying the Discussion Paper distributed by the Integrated Reporting Committee of South Africa in January 2011 as well as the Discussion Paper delivered by the IIRC in September 2011 (EY, 2012:10). The markers also took note of the "Summary of Responses" issued in May 2012 in response to the September 2011 Discussion Paper (EY, 2012:10). These reports were reviewed for guidance on the information that should be included in an IRG (EY, 2012:10).

Regarding the EIRAs for 2013, guidance was found on the content of an IR by examining the Discussion Paper, "Towards Integrated Reporting – Communicating Value in the 21st Century", issued in September 2011 by the IIRC (EY, 2013:15). The adjudicators also took the following sources into account: responses to the September 2011 Discussion Paper that was distributed by the IIRC in May 2012, the preliminary framework which was published during July 2012, and finally, the Prototype Framework, published in November 2012 (EY, 2013:15).

A substantial amount of ideas from these documents were captured within the Consultation Draft of the IIRF published in April 2013 by the IIRC (EY, 2013:15). Responses to the various discussion papers indicated diverse opinions on several issues about the definition and content of an IR (EY, 2012:10; EY, 2013). The mark plan was therefore developed to ensure that it is not prescriptive for ambiguous areas in the IIRF (EY, 2012:10; EY, 2013).

For the purpose of the 2014 EIRAs, the mark plan was based mainly on the "Consultation Draft of the IIRF" issued by the IIRC in April 2013 (EY, 2014a:25). The final IIRF that was published by the IIRC in December 2013 did not influence the mark plan, seeing that the framework was issued too late to be considered for the 2013 IRGs (EY, 2014a:25).

The mark plan for the EIRAs from 2015 – 2018 was informed by the Guiding Principles and Content Elements that are found in the IIRF (EY, 2015:26; EY, 2016; EY, 2017; EY, 2018). A score out of 10 is given for each of the seven Guiding Principles as well as for each of the eight Content Elements (EY, 2015:26; EY, 2016; EY, 2017; EY, 2018). Marks are also given for the level to which the company's IR includes the fundamental concepts of the IIRF, by explaining how value is added based on the six capitals (EY, 2015:26; EY, 2016; EY, 2017; EY, 2018).

Even before the IIRF, the development of the marking plan was considered carefully by the adjudicators from the College of Accounting at the University of Cape Town (UCT) together with EY's Professional Practice Group (EY, 2013:15). As is apparent from the adjudication process explained above, the IIRF and its draft version was used only as the basis of the mark plan from 2014 onwards. This is in accordance with the period covered in the data analysis to be explained in chapter 3. EY publishes each year's awards on its website. Furthermore, the exact details of the specific year's companies, adjudication process, and other details can be found in the specific EIRAs report.

2.7 CHAPTER SUMMARY

The main purpose of chapter 2 was to address secondary objectives a, b and c as explained in Chapter 1, par. 1.4.2.1.

In order to fulfil objective a, the chapter commenced with an introduction explaining that companies currently have three demanding issues. These are the worldwide crises in finance, climate change, and ecological overshoot, all of which will affect companies' long-term planning. It was determined that various stakeholders are realising this fact and are becoming increasingly interested in the long-term sustainability of a company. Stakeholders believe that firms should be clear about their influence on the world with its restricted resources (De Villiers & Van Staden, 2010:227). The integrated report (IR) was introduced to address these demanding issues.

Par. 2.2 focused on the importance of integrated reporting (IRG) by investigating the journey to IRG as well as its destination, focusing on the relevant capitals. It was established that the journey to IRG started as early as 1994 since traditional reporting practices were not fulfilling the needs of shareholders and other stakeholders any longer. The main change from previous reporting practices to IRG was the move from focusing solely on the financial capital to considering all capitals, namely financial, manufactured, intellectual, human, social and relationship, and natural.

The present study therefore evaluated the purpose of IRG by focusing on all capitals. In the process the focus also fell on the significance of companies as well as the damaging effect of a misstep which can destroy the value of a company. It was therefore determined that companies should prioritise the reporting on all capitals, seeing that missteps may occur in any of the capitals, which will impact stakeholders. Currently, companies are scrutinised constantly, given the constant changes in technology and stronger expectations by the public (Wijnhoven, 2014:9). Stakeholders are demanding more transparency and accountability from companies. The importance of IRG to meet the continuously increasing expectations of the various stakeholders has become apparent.

Literature has identified the ability of IRG to combine financial and non-financial information in a single report. IRG offers future-oriented information to stakeholders who are finding the long-term sustainability of companies increasingly important. Finally, par. 2.2 explored and discussed integrated thinking and the three main benefits of IRG, which are internal company benefits, external market benefits, and the fact that IRG manages regulatory risk.

To address objective b, the present research investigated the importance of a company's financial performance, risk and growth. These three terms were defined and analysed and its use by stakeholders evaluated. Extensive literature was found confirming that various stakeholders place high value on information provided through financial indicators.

As part of the literature study, a document analysis was done on similar studies published on the topic. The aim was to establish both the importance of IRG and financial indicators as well as determine which years and ratios have not yet been investigated. Eleven studies were analysed to highlight the impact of IRG particularly on financial indicators.

Finally, objective c was reached by presenting an explanation of ratios by which to analyse financial performance, risk and growth for purposes of the present study. A background to financial ratios was provided as well as an explanation of the various ratios to measure financial indicators. The study concurred with various researchers that financial ratios are valuable, however, different researchers use different ratios, which should thus be considered

in combination. Therefore, par. 2.5 closed with an examination of the 20 financial ratios and the market capitalisation figure relevant to this study.

In terms of objective c, EY's Excellence in Integrated Reporting Awards (EIRAs) process was set out to explain the adjudication process used to achieve the various rankings on IRG: 'Excellent', 'Good', 'Average' or 'Poor'. The International Integrated Reporting Framework (IIRF) was used to develop the mark plan from only 2015 onwards, seeing that discussion papers and responses regarding this topic influenced the mark plan previously.

In the following chapter (ch 3), the research design and methodology for the empirical study will be presented, along with the motivation for selecting this design based on this study's purpose. The document analysis done in this study will also be explained.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

"Some people consider research as a movement, a movement from the known to the unknown" (Kothari, 2004:1)

3.1 INTRODUCTION

The purpose of research was to discover hitherto unknown facts (Shaghi, 2018:7). Shaghi (2018:7) explains that research is performed when applying scientific procedures to answer questions. Research are conducted for several reasons: the evident separation of causes and effects; accurate operationalising of theoretical relationships; measuring and quantification of phenomena; creating research designs in order to generalise findings; and expressing universal laws (Flick, 2018:13).

Kothari (2004:1) circumscribes research as a "scientific and systematic search for pertinent information on a specific topic". Research means gathering scientific information through various methods and procedures, without being impeded by personal views or feelings (Welman, Kruger & Mitchell, 2005:2). It is crucial to use the appropriate research methods since an inappropriate method can be detrimental to the study (Welman *et al.*, 2005:2-3). Leedy and Ormrod (2010:3) point out that research requires a detailed plan to proceed.

The primary aim of this chapter is to explain the proper research design and methodology applicable to the present study. The research methodology was formulated to answer the problem statement in par. 1.3, and answer the research objectives set out in par. 1.4.

To address the mentioned research objectives, the chapter starts off by explaining the research process that was followed. Thereafter, the chapter investigates the research problem and design. The research methodology applicable to this study is explained in detail. Finally, a summary is provided of chapter 3.

3.2 THE RESEARCH PROCESS

'Research' in everyday speech refers to a pursuit for knowledge (Kothari, 2004:1). According to Leedy and Ormrod (2010:2), research is an organised process to gather, scrutinise, and interpret information for an in-depth understanding of the relevant phenomenon in which the researcher is interested. The Oxford English Dictionary (2018d) describes research as "the systematic investigation into and study of materials and sources in order to establish facts and

reach new conclusions". In turn the Merriam Webster Online Dictionary (2018b) defines it simply as "the collecting of information about a particular subject".

Kothari (2004:1) asserts that "research is an art of scientific investigation". It can therefore be submitted that research can be viewed as the orderly gathering, investigation and interpretation of data. The aim would be empowering the researcher to reach an in-depth understanding of, and draw relevant conclusions on, a particular subject.

There are various ways to list the steps in a research process. Such a process can be divided into the following six stages, as presented in Table 3.1 below.

Table 3.1 Stages of the research process

#	Zikmund, Babin, Carr and Griffin (2013:59)	Creswell (2012:7)
1	"Defining the research objectives	"Identifying a research problem
2	Planning a research design	Reviewing the literature
3	Planning a sample	Specifying a purpose for research
4	Collecting the data	Collecting data
5	Analysing the data	Analysing and interpreting the data
6	Formulating the conclusions and preparing the report"	Reporting and evaluating research"

Source: Researchers listed above

Mouton (2001:48-49) combines stages 3 to 5 above by condensing research into four stages as listed in Table 3.2 below.

Table 3.2 The research process

1. Providing the research problem	Par. 3.3
2. Identifying the research design	Par. 3.4
3. Establishing the applicable research methodology	Par. 3.5
4. Documenting the research outcomes	Ch 4

Source: Adapted from Mouton (2001:48-49)

These acknowledged four stages in Table 3.2. indicate the process taken by this research, and therefore the layout of this chapter is shaped according to these stages.

3.3 THE RESEARCH PROBLEM

Leedy and Ormrod (2010:44) as well as Fox and Bayat (2008:21) view the research problem as "the heart of the research process", while Zikmund *et al.* (2013:8) consider the problem and opportunities as the initial phase in research. Kothari (2004:12) explains that research

problems consists of either problems that relate to 'states of nature' or those describing the relationship among variables. Bless, Higson-Smith and Kagee (2006:29) add that a research problem is conveyed as a general question about the association amongst more than one variable.

A research problem should be defined narrowly to ensure comprehensive investigation (Welman *et al.*, 2005:13). Creswell (2012:8) points out that by having a narrowed-down research problem, the research topic is more focused since attention will be concentrated on a specific aspect of this topic.

Leedy and Ormrod (2010:46-47) provide various strategies to identify research problems such as simply being alert to phenomena that require an explanation in a professional practice or in ordinary events. A study of existing literature can identify unknown facts (Leedy & Ormrod, 2010:47). Research problems can also be identified by attending professional conferences in the relevant discipline or by seeking advice from experts in the relevant research field (Leedy & Ormrod, 2010:47).

Specific to the present study, the research problem was stated in par. 1.3: "How does integrated reporting (IRG) affect financial indicators of a company?" The answer to this question sought to determine the trend of financial indicators of certain Johannesburg Stock Exchange (JSE) -listed companies in South Africa after implementing IRG, based on the International Integrated Reporting Framework (IIRF). This research problem was identified by reviewing existing literature, attending a conference in the relevant discipline as well as seeking advice from expert scholars and researchers.

Based on stage 2 of the research process (see Table 3.2 above), the identification of the research design follows.

3.4 IDENTIFYING THE RESEARCH DESIGN

Following the identification and formulation of the research problem, the research design must be identified. The overall research design and precise research methods are planned purposely by researchers to ensure relevant data are gathered to answer a research problem (Leedy & Ormrod, 2010:3), as explained in par. 3.3. The research design is basically a plan with the aim of answering the research question (Burns, 2000:145).

Bryman and Bell (2011:40) explain that a research design offers a framework designed for the gathering and analysing of data. A research design can be viewed as the 'blueprint' indicating how the researcher proposes to undertake the research (Mouton, 2001:55). Mouton (2001:56) adds that the research design should focus on the final outcome, the type of intended study and the purpose of the results. From the clarifications above, it can be concluded that a

research design is the strategy a researcher selects that allow the most effective analysis of events linked to the proposed final result.

Mouton (2001:144) discusses the research design map by specifying four dimensions of research design. The four dimensions and the resultant classification are summarised in Table 3.3 below. These dimensions detail the type of data used in the present study, as well as the researcher's control over the research design.

Table 3.3 Four dimensions of research design

	Classification	Type
Dimension 1	Conceptual – empirical versus non-empirical	1. Empirical 2. Non-empirical
Dimension 2	New data versus existing data	1. Primary 2. Secondary 3. Hybrid
Dimension 3	Type of data	1. Numeric 2. Textual 3. Combination
Dimension 4	Degree of control	1. High 2. Medium 3. Low

Source: Adapted from Mouton (2001:146)

Dimension 1 entails the conceptual nature of research and indicates whether a study is viewed as empirical or non-empirical. Empirical studies depend solely on an experiment or observation, "often without due regard for systems and theory" (Kothari, 2004:4). Kothari (2004:4) explains that empirical studies are data-based, entail an experimental research type, and provide conclusions that can be verified through observation or experiments. According to the PennState Univ libraries (2018), empirical research relies on the observation and measurement of phenomena. The knowledge that are gained originates from the actual experience instead of theory or beliefs (PennState Univ libraries, 2018). On the other hand, non-empirical studies do not rely directly on data, therefore it is considered to be theory-driven (Definitions, 2018). Dimension 1 applied to the present study implied an empirical analysis, seeing that data were collected and analysed (data-based) in response to the primary objective of the study.

Dimension 2 displays whether data necessary for a study already exist or new data should be gathered. Primary data refer to those obtained for the first time (original data), while secondary data have already been obtained and processed through the statistical process by another researcher (Kothari, 2004:95). As indicated by Table 3.3 above, a researcher can opt for using hybrid data, which combines primary and secondary data. The present study was

based on secondary data, seeing that existing literature was used in the review and existing financial information obtained from IRESS were used in the empirical study.

Dimension 3 indicates the type of data as either numerical, textual or a combination of the two. Numerical data implies information that is structured well such as "statistics, numbers and quantitative measurements", while textual data are not well-structured, has rich meaning, and occasionally has multiple meanings (Mouton, 2001:18). A combination of textual and numerical data were used in the present study. Textual data were obtained from the literature review, whereas numerical data were used by performing a secondary data analysis on financial information.

Dimension 4 divides the researcher's level of control over the research design into three possible levels: high, medium or low. According to Kothari (2004:34), the term 'control' is used when a research design minimises the influence of extraneous independent variables. In the present research, medium control was exerted since the study is based on secondary data which cannot be affected. However the collection of sources, methods and the analysis of the data required judgment.

It is apparent that the identified research design is a medium controlled empirical study based on numerical secondary data. The paragraph below will explore the research methodology applicable to the present study, agreeing with stage three of the research process (see Table 3.2).

3.5 ESTABLISHING THE APPLICABLE RESEARCH METHODOLOGY

"Underlying and unifying any research project is its methodology" (Leedy & Ormrod, 2010:6). The research methodology is the overall approach when undertaking the research project (Leedy & Ormrod, 2010:12). According to Kothari (2004:8), a research methodology entails the several steps which a researcher generally adopts in order to study the research problem as well as the logical structure behind these steps. Mouton (2001:56) describes research methodology as the emphasis on the distinct stages in the research process and the most objective measures to be implemented. Welman *et al.* (2005:2) understands research methodology as considering and explaining the logic behind research methods and techniques. This also implies considering and comparing various research methods to conclude on the knowledge that these methods can offer (Greener, 2011:5). Kothari (2004:8) elaborates that the research methodology provides a manner to resolve the research problem systematically and can be viewed as a science of "studying how research is done scientifically".

Leedy and Ormrod (2010:6) explain that the research methodology directs the research process as a whole and has two primary functions:

1. Prescribe and control the acquisition of data.
2. Extract meaning from the acquired data (interpretation of data).

From the discussion above, it can be submitted that research methodology focuses on the particular research steps and methods which are systematically applied in the research process to solve the research problem. The layout in Table 3.4 below is considered as the research methodology followed in the present study.

Table 3.4 Layout explaining research methodology applicable to study

Types of research	Par. 3.5.1
Population and sampling	Par. 3.5.2
Data collection	Par. 3.5.3
Data analysis	Par. 3.5.4
Validity and reliability of data	Par. 3.5.5
Ethical considerations	Par. 3.5.6

3.5.1 Types of research

Researchers differentiate between different types of research. The type relevant to the present study was selected to ensure it is in accordance with the research method, addressing the mentioned research objectives. Blanche, Blanche, Durrheim and Painter (2006:44) identify three different types of research:

a. exploratory, descriptive and explanatory;

b. basic and applied; and

c. quantitative and qualitative.

In the present study, aspects from both quantitative and qualitative research forms were utilised, implying a mixed method design, which are discussed below as an elaboration of c, namely ‘Mixed methods’.

a. Exploratory, descriptive and explanatory research

Bless *et al.* (2006), Neuman (2011:38) and Zikmund *et al.* (2013) report that exploratory, descriptive and explanatory research are used frequently.

Exploratory: This approach is followed when phenomena are explored. When there is limited information about a particular research topic or when the likelihood of conducting a specific research study is explored, this is referred to as an exploratory approach (Kumar, 2014:31).

Babbie (2012:43) explains that the exploratory approach is commonly used in the following instances: answering a researcher's curiosity and enhancing understanding; testing the feasibility of a more in-depth study; or developing the methods for use in further study. Exploratory research is necessary when limited information is available on a new research area (Bless *et al.*, 2006:47). Thus, the goal of such an approach is to gain comprehensive understanding of a person, community or phenomenon (Bless *et al.*, 2006:47). The present study did not follow this approach, seeing that the IRG is a familiar research topic and there are numerous existing possibilities for further research.

Descriptive: According to Kumar (2014:13), this type of research describes what is prevalent in the underlying problem of the study. This approach can be summarised as follows: "Descriptive observes and describes what was observed" (Cassim, 2014:48). Robbetze (2015:84) explains that descriptive research is performed when researchers describe a phenomenon by observing its characteristics during data collection. Such an approach provides a systematic description of a situation, problem, phenomenon as well individuals' attitudes towards certain issues (Kumar, 2014:13). Zikmund *et al.* (2013:53) posit that this type of research attempts to illustrate a specific condition by reciting the characteristics of people, organisations, objects, or the environment. From these interpretations, it can be inferred that this research style is based on describing what the researcher has observed.

Explanatory: Kumar (2014:13) indicates that the main focus of such a study is to shed light on "why and how there is a relationship between two aspects of a situation or phenomenon". Bless *et al.* (2006:43) point out that explanatory research helps explain the relationship amongst variables by proving that an adjustment in one variable leads to a change in the other. Zikmund *et al.* (2013:54-55) typifies it as 'casual' research with the purpose of finding the cause and effect of a relationship. Zikmund *et al.* (2013:54) add that this type of research is "very powerful" since it creates more control.

The above-mentioned three research types can be labelled as building blocks, as explained by Cassim (2014:48): "the exploratory build foundations for the descriptive, descriptive in turn initiate the basis for explanatory research". As was indicated, all three types of research can be applied to a study: using exploratory research to comprehend the problem, descriptive research to describe the problem and explanatory research to recognise the relationship between the two relevant aspects in the study. Nevertheless, the present study followed mainly the explanatory research design. The reason is that the study's aim was to determine the relationship between IRG and the financial indicators of certain JSE-listed companies.

b. Basic and applied research

The aim of research can be divided into a basic and applied focus (Bless *et al.*, 2006; Cassim, 2014:46). Blanche *et al.* (2006:45) explain the difference: "Applied and basic researchers often study the same phenomena, but approach the study from different perspectives."

Basic: This type of research is applied to gather information with a wide range of applications and therefore, increases the existing scientific knowledge (Kothari, 2004:3). Basic research increases researchers' understanding of a phenomenon in the following ways: obtaining facts and information to improve existing theories or develop new ones (Bless *et al.*, 2006:44); improving the current knowledge about research methods (Kumar, 2014:13); and increasing human understanding of theories on a certain topic (Leedy & Ormrod, 2010:44). Brynard and Hanekom (2006:7) view the purpose of basic research as developing theories; Smit (1995:3) explains it as increasing "scientific knowledge and technology". From these interpretations, it can be inferred that basic research aims to advance existing theories for improved understanding.

Applied: Kumar (2014:13) points out that this type is the most common approach in social research. Brynard and Hanekom (2006), Kothari (2004:3), Neuman (2011) as well as Smit (1995:4) explain the main purpose of applied research as determining a solution for a persistent practical problem. Applied research are used to solve the practical issues of a problem, make decisions, analyse policies, or develop communities (Blanche *et al.*, 2006:45). If a researcher's main incentive is to solve a problem specific to a certain community, the approach is referred to as applied research (Bless *et al.*, 2006:45). According to Kothari (2004:3), this form of research seeks a solution for a society's or an organisation's immediate problem. Bless *et al.* (2006:45) elaborate that the focus is to apply the findings of the basic research to the particular community's problem. Thus, to gain knowledge about the world people live in, basic research are applied to a specific problem or context (Blanche et al., 2006:45; Neuman, 2011:26). Robbetze (2015:85) summarises this approach as follows: Researchers apply basic research techniques to solve particular problems, thereby enhancing problem solving and decision-making.

Leedy and Ormrod (2010:44) remind researchers of a fine line (often undefined or 'blurry') between basic and applied research. In the present study, applied research was conducted. The reason is the findings can influence the decisions made by the following role-players: the IIRC, management responsible for implementing IRG in their respective companies, and the entities' other stakeholders.

c. Quantitative and qualitative research

In empirical research usually two main approaches are followed, namely qualitative and quantitative research, both of which are expounded below.

Qualitative: This form of research consists of words and descriptions (Bless *et al.*, 2006:43). Creswell (2014:183) points out that this method is based on text and image data, have unique phases of data analysis and appeal to followers of diverse designs. Cassim (2014:43) adds that qualitative research does not "examine or measure in terms of amount, quantity or frequency", but emphasises "meaning and processes". According to Brynard and Hanekom (2006:37), qualitative research is descriptive in nature where experiences and perceptions are translated into writing. Denzin and Lincoln (2000:8) explain that the word 'qualitative' focuses on objects, meanings and processes, which are not analysed or measured in quantity, amount, strength, or occurrence, if measured at all.

Zikmund *et al.* (2013:135) points out that qualitative research "observe and interpret". In this regard, Creswell (2012:16) identifies the main characteristics of qualitative research as investigating a problem and gaining a thorough understanding of a particular phenomenon. Kumar (2014:32) views a study as qualitative if its primary aim is to provide a broad description of difference and variety within a phenomenon, condition or attitude.

By using language, qualitative research offers a more subtle and meaningful way to record an individual participant's experience (Bless *et al.*, 2006:44). A common characteristic is that such a method provides an "in-depth description of the case or phenomena under study" (Gast, 2010:10). According to Gast (2010:16), the qualitative approach can add value by serving as the centre from which research questions can be formulated. Such research can also enlighten researchers about observations that are documented in quantitative studies, as explained in the following paragraph (Robbetze, 2015:85). Based on the explication above, it can be concluded that qualitative research takes place when language is used to document the explanation of an event or phenomenon.

An example of an analytical method in qualitative research is *document analysis* (Bowen, 2009:27). This method entails reviewing or assessing printed or electronic documents (Bowen, 2009:27). Documents consists of text or images and words (therefore qualitative) that have been documented without intervention by the researcher (Bowen, 2009:27). Wong, Casey and Wahl (1982:647) explain that document analysis can be useful by extracting information to establish data bases. From another angle, Bowen (2009:28) explains that this analytic procedure entails the discovery, selection, assessment and 'synthesising' of data contained in the documents.

Quantitative: In this form of research, on the other hand, the researcher depends on statistical analysis of the data, which is normally in numeric form for quantitative measurement (Adams, Khan, Raeside and White, 2007; Creswell, 2012:19). This method challenges objective theories by determining the association amongst variables (Creswell, 2014:4). "It is applicable to phenomena that can be expressed in terms of quantity" (Kothari, 2004:3). Maree (2016:162) explains that quantitative research utilises numerical data collected from a sample, to generalise findings towards the total population. Teddlie and Tashakkori (2009:5) view quantitative as collecting, analysing, understanding and presenting numerical information. According to Robbetze (2015:84), this type of research takes place as soon as numerical data are gathered and examined by using statistics to recognise relationships between variables. Thereafter these relationships can be generalised to the total population (Robbetze, 2015:84). Zikmund *et al.* (2013:135) explain that quantitative research "represents phenomena by assigning numbers in an ordered and meaningful way".

Welman *et al.* (2005:8) summarises the difference between the approaches as follows: qualitative data are presented in language, while quantitative data are presented in numbers. In the present study, both quantitative and qualitative methods were used, therefore a mixed method approach was followed, as explained in the paragraph below.

Mixed methods: According to Creswell (2012:20), Johnson and Onwuegbuzie (2004) and Teddlie and Tashakkori (2009), researchers may use a mixed method approach, which combines both quantitative and qualitative designs. Although these two methods each answers different questions, researchers may have a shared interest in attempting to understand a certain phenomenon (Barbour, 2008:11-12). In such a case, the two main approaches may be used to complement each other (Barbour, 2008:11-12). Teddlie and Tashakkori (2009:4) explain that the mixed method approach is concerned with "both narrative and numerical data and their analysis". On a scale with qualitative research at one opposite and quantitative research at the other side, mixed method research "covers the large set of points in the middle area" (Johnson & Onwuegbuzie, 2004:15). In this regard, Johnson, Onwuegbuzie and Turner (2007:113) summarise mixed method research as a mixture of ideas from qualitative and quantitative research.

Mixed method research strives to respect the insight of both standpoints while also pursuing a practical middle explanation for several research problems (Johnson *et al.*, 2007:113). Creswell (2012:22) argues that the main motivation for a mixed method design is that an improved understanding of the research problem is reached when both forms of data are combined instead of applying only one type. Johnson and Onwuegbuzie (2004:14-15) explain that the objective of mixed method research is not to eliminate any of the two methods; instead to use the strengths while minimising the flaws of both in single and combined research

studies. There is a need to complement one research approach with another, seeing that research currently is increasingly becoming interdisciplinary, multifaceted, and vigorous (Johnson & Onwuegbuzie, 2004:15). Maree (2016:313) suggests that a mixed approach incorporating qualitative and quantitative methods, will help provide a broader research approach, which delivers a more profound understanding of the research problem.

The present study in particular is based on the methodology of mixed method research, utilising both qualitative and quantitative designs to ensure the primary and secondary objectives of the study are attained. Therefore, this study consisted of two phases of research, as explicated below.

Qualitative: This part of the present study determined the importance of IRG through a literature review and explained the importance of a company's financial performance, risk and growth. This study also attempted to describe the importance of the ratios used to analyse these three financial indicator categories. A document analysis was done as part of qualitative research by examining previous studies to determine the financial indicators they used, which also focused on the impact of IRG on financial indicators.

Quantitative: After achieving the qualitative objective of the study, the focus shifted to the quantitative research methodology. This approach was used to gain a more profound understanding of the impact of IRG on financial indicators. The financial statements of JSE-listed companies were analysed according to the financial ratios identified in the literature review. A statistical analysis of the quantitative data is provided in chapter 4. Subsequently, the population and sample relevant to this study are explicated.

3.5.2 Population and sampling

3.5.2.1 Population

Creswell (2012:142) defines a population as a "group of individuals who have the same characteristic". Babbie (2015:193) views it as the theoretically identified collection of the study elements. Burns (2000:83) explains that a population is the total group of research elements that must all have at least one similar characteristic that all elements share. Fox and Bayat (2008:18) elaborate that a population is the potential respondents who adhere to the criteria for a specific research project. A population includes the total group of study elements that a researcher analyses to formulate conclusions (Welman *et al.*, 2005:52). The sample is selected from the population that comprises the complete group of elements (Welman *et al.*, 2005:53). Therefore, in essence, a population entails all the elements within the area under research.

In the present study, the targeted population consists of all JSE-listed companies since 31 December 2017. The JSE is "one of the world's 20 largest exchanges by market capitalisation ($1.007bn at end-2013)" and are the main exchange in Africa (JSE, 2018c).

3.5.2.2 Sampling

Burns (2000:83) points to the important task of selecting a representative sample from the selected population by using a suitable technique to ensure the selection is not biased. Since researchers can rarely test the total population, they generalise the total based on the selected sample (Burns, 2000:83; Tabachnick & Fidell, 2014). For these generalisations to be correct, the sample must represent the population in terms of the proportion or relative regularity that the similar characteristics show in all its elements (Burns, 2000:83).

Tan (2008:29) defines sampling as methods to choose a subset (sample) from the whole population (the total elements). For Zikmund *et al.* (2013:66) sampling is a method that "draws conclusions based on measurements of a portion of the population". Bless *et al.* (2006:98) refer to the subset of the total population, which will truly be studied and whose characteristics will be generalised to the whole. Welman *et al.* (2005:55) posit that a sample should represent the population from which it was selected in order to generalise the results. Thus, a sample can be considered as the small amount of items carefully chosen from the total population. This sample represents the total population by embodying the same characteristics.

According to Welman *et al.* (2005:56), researchers often distinguish probability from non-probability sampling. Welman *et al.* (2005:56) and Bless *et al.* (2006:100) explain that *probability* sampling is used when the researcher can determine that any element of the population will be selected as part of the sample. Zikmund *et al.* (2013:395) point out that all probability sampling methods are based on selection by chance, thus chosen randomly. This method avoids the possibility of bias when a sample is selected (Zikmund *et al.*, 2013:395). The probability method ensures each element has a known probability in order to be selected as part of the sample (Jackson, 2014:119). Four methods of probability sampling can be pointed out: simple random, systematic, stratified and cluster sampling. Table 3.5 below elaborates on each of these types.

Table 3.5 Description of the different probability sampling types

Probability sampling type	Description
Simple random sampling	This sampling method ensures all the elements have an equal chance of being selected. Elements are randomly selected with chance as the only selection criterium. A simple example is drawing items from a hat, whereas more sophisticated techniques can be applied electronically, e.g. computer-generated random numbers.
Systematic sampling	A starting point is a randomly selected element, after which the selection is made based on equal intervals, for instance, the collection of every third unit. Systematic sampling is more time-efficient, less costly and more practical than random sampling, however, relies on an unbiased, complete population without unusual predictability.
Stratified sampling	Divides a population into different groups (strata) whose elements have approximately the same characteristics, for example age or gender. Thereafter, each stratum is sampled randomly. Stratified sampling ensures that the sample is representative of the population with noticeably distinct strata.
Cluster sampling	The main concern with the previous three types of sampling is that complete lists of the elements are not always available. In such instances, cluster sampling can be used by dividing the population randomly into large clusters of elements. The main sampling unit is not the single element in the population anymore, but entails a larger cluster of elements. This type of sampling can decrease costs and limit the time necessary to gather information.

Sources: Bless *et al.* (2006:101-105), Welman *et al.* (2005:59-66) and Zikmund *et al.* (2013:395-398)

With *non-probability* sampling on the other hand, researchers are unable to determine the probability of the elements that are selected (Huysamen, 1994; Welman *et al.*, 2005:56). The non-probability style is less complex and more cost-effective and time-efficient than probability sampling (Welman *et al.*, 2005:68). Jackson (2014:121) points out that the non-probability sampling method is often applied since it is less costly and produces samples with less effort. The different categories of non-probability samples are explicated in Table 3.6 below.

Table 3.6 Description of the different non-probability sampling types

Non-probability sampling type	Description
Convenience sampling	Samples easily available elements. This type of sampling is used when the researcher economically must acquire a large number of questionnaires completed in a brief amount of time. The results can, however, not be projected beyond the selected sample, seeing that generalisation with this method is highly risky.
Judgment sampling	This applies when researchers use their own judgment about certain applicable characteristics of the sample element. Samples are chosen deliberately to fulfil a specific purpose, even if the sample does not entirely characterise the total population. Therefore, this type depends more on the researcher's subjective considerations and preconceptions than on objective criteria.
Quota sampling	Focus on several subgroups within a population, based on certain characteristics the researcher requests. This style leads to prompt data collection, accessibility and decreased costs. The flaws of this category is that it captures only certain aspects of a population's diversity and disregards others; the number of elements in each subgroup may not represent the total population for the subgroup; and researchers may have to use convenience sampling to select each subgroup.
Snowball sampling	Probability sampling methods are used firstly, after which additional individuals are gathered from the information provided by the initial individuals. Snowball sampling is cost-effective and leads to smaller sample sizes. Bias must be considered since the initial respondents may suggest a respondent similar to them or who shares their views and interests.

Sources: Bless *et al.* (2006:105-106), Welman *et al.* (2005:67-69) and Zikmund *et al.* (2013:392-395)

As explained in par. 1.5.5, the present study opted for *judgment* sampling, seeing that the top 100 companies were chosen carefully as the initial sample from the population (all JSE-listed). Firstly, these top 100 companies were selected based on their market capitalisation as of 31 December 2017 and according to the EY's EIRAs 2018. These 100 companies comprised 95% of the market capitalisation of the JSE at 31 December 2017 (EY, 2018). Judgment sampling was applied further by excluding the industrial metals and mining companies within the basic materials industry as well as the financial industry. The motivation was that these

two specialised industries have different profitability and asset structures (Rama (2013:7). Table 3.7 below outlines the original sample, namely the top 100 JSE-listed companies according to EY's EIRAs for 2018. Each company's industry is provided in the table to explain its inclusion based on the selection of judgment sampling. The sector and industry classification was obtained electronically (e.g. email) from a call centre agent: client services (Trading and Market Services) from the JSE on 23 August 2018.

Table 3.7 Judgment sampling as applied in the study

Top 100 JSE company name (EY, 2018:6)	Industry (JSE, 2018a)	Included or not	Sector within basic materials industry if not included
AECI Limited	Basic materials	✔	
African Rainbow Minerals Ltd	Basic materials	✘	Mining
Anglo American Platinum Ltd	Basic materials	✘	Mining
Anglo American plc	Basic materials	✘	Mining
AngloGold Ashanti Ltd	Basic materials	✘	Mining
Anheuser-Busch Inbev NV/SA	Consumer goods	✔	
Aspen Pharmacare Holdings Ltd	Health care	✔	
Assore Ltd	Basic materials	✘	Mining
Astral Foods Ltd	Consumer goods	✔	
Attacq Ltd	Financials	✘	
AVI Ltd	Consumer goods	✔	
Barclays Africa Group Ltd	Financials	✘	
Barloworld Ltd	Industrials	✔	
BHP Billiton plc	Basic materials	✘	Mining
Bid Corporation Ltd	Consumer services	✔	
Blue Label Telecoms Ltd	Telecommunications	✔	
Brait SE	Financials	✘	
British American Tobacco plc	Consumer goods	✔	
Capital & Counties Properties plc	Financials	✘	
Capitec Bank Holdings Ltd	Financials	✘	
Clicks Group Ltd	Consumer services	✔	
Compagnie Financière Richemont SA	Consumer goods	✔	
Coronation Fund Managers Ltd	Financials	✘	
Curro Holdings Ltd	Consumer services	✔	
Datatec Ltd	Technology	✔	
Dis-Chem Pharmacies Ltd	Consumer services	✔	
Discovery Ltd	Financials	✘	
Distell Group Ltd	Consumer goods	✔	
Echo Polska Properties NV	Financials	✘	

Table 3.7 Judgment sampling as applied in the study (continues)

Top 100 JSE company name (EY, 2018:6)	Industry (JSE, 2018a)	Included or not	Sector within basic materials industry if not included
Exxaro Resources Ltd	Basic materials	×	Mining
FirstRand Ltd	Financials	×	
Fortress Income Fund Ltd	Financials	×	
Glencore plc	Basic materials	×	Mining
Globe Trade Centre SA	Financials	×	
Gold Fields Ltd	Basic materials	×	Mining
Greenbay Properties Ltd	Financials	×	
Growthpoint Properties Ltd	Financials	×	
Hammerson plc	Financials	×	
Hosken Consolidated Investments Ltd	Financials	×	
Hyprop Investments Ltd	Financials	×	
Impala Platinum Holdings Ltd	Basic materials	×	Mining
Imperial Holdings Ltd	Industrials	✓	
Intu Properties plc	Financials	×	
Investec plc	Financials	×	
Investec Property Fund Ltd	Financials	×	
Italtile Ltd	Consumer services	✓	
JSE Ltd	Financials	×	
KAP Industrial Holdings Ltd	Industrials	✓	
Kumba Iron Ore Ltd	Basic materials	×	Industrial Metals & Mining
Liberty Holdings Ltd	Financials	×	
Life Healthcare Group Holdings Ltd	Health care	✓	
MAS Real Estate Inc	Financials	×	
Massmart Holdings Ltd	Consumer services	✓	
Mediclinic International plc	Health care	✓	
MMI Holdings Ltd	Financials	×	
Mondi plc	Basic materials	✓	
Mr Price Group Ltd	Consumer services	✓	
MTN Group Ltd	Telecommunications	✓	
Naspers Ltd	Consumer services	✓	
Nedbank Group Ltd	Financials	×	
NEPI Rockcastle plc	Financials	×	
Netcare Ltd	Health care	✓	
Northam Platinum Ltd	Basic materials	×	Mining
Oceana Group Ltd	Consumer goods	✓	
Old Mutual plc	Financials	×	
Pick n Pay Stores Ltd	Consumer services	✓	
Pioneer Food Group Ltd	Consumer goods	✓	
PSG Group Ltd	Financials	×	
PSG Konsult Ltd	Financials	×	

Table 3.7 Judgment sampling as applied in the study (continues)

Top 100 JSE company name (EY, 2018:6)	Industry (JSE, 2018a)	Included or not	Sector within basic materials industry if not included
Rand Merchant Investment Holdings Ltd	Financials	×	
RCL Foods Ltd	Consumer goods	✓	
Redefine International plc	Financials	×	
Redefine Properties Ltd	Financials	×	
Reinet Investments SCA	Financials	×	
Remgro Ltd	Industrials	✓	
Resilient REIT Ltd	Financials	×	
Reunert Ltd	Industrials	✓	
RMB Holdings Ltd	Financials	×	
SA Corporate Real Estate Ltd	Financials	×	
Sanlam Ltd	Financials	×	
Santam Ltd	Financials	×	
Sappi Ltd	Basic materials	✓	
Sasol Ltd	Basic materials	✓	
Shoprite Holdings Ltd	Consumer services	✓	
Sibanye Gold Ltd	Basic materials	×	Mining
South32 Ltd	Basic materials	×	Mining
Standard Bank Group Ltd	Financials	×	
Super Group Ltd	Industrials	✓	
Telkom SA SOC Ltd	Telecommunications	✓	
The Bidvest Group Ltd	Industrials	✓	
The Foschini Group Ltd	Consumer services	✓	
The Spar Group Ltd	Consumer services	✓	
Tiger Brands Ltd	Consumer goods	✓	
Tongaat Hulett Ltd	Consumer goods	✓	
Truworths International Ltd	Consumer services	✓	
Tsogo Sun Holdings Ltd	Consumer services	✓	
Vodacom Group Ltd	Telecommunications	✓	
Vukile Property Fund Ltd	Financials	×	
Woolworths Holdings Ltd	Consumer services	✓	
Zeder Investments Ltd	Financials	×	
Total companies included in sample:		**46**	

Sources: EY (2018:6) and JSE (2018a)

From Table 3.7 above, it is clear that 46 of the top 100 JSE-listed companies that were sampled originally, remained after the second stage of judgmental sampling. The following paragraph explains how the relevant data were collected after selecting the final sample for the present study.

3.5.3 Data collection

At this point, the research problem was provided, the research design identified, and the applicable research methodology established, namely explanatory, applied research following the mixed method approach. Furthermore, the sample has been selected as explained in par. 3.5.2.2 above. Thereafter, the collected data were analysed to reach relevant conclusions on the research (Kumar, 2014:41). Bless *et al.* (2006:112) advise that data should be gathered with the purpose of answering the research question. Therefore, after collecting the data, the researcher should be able draw conclusions, which would help answer the research question.

The research question of the present study was: “How does IRG affect financial indicators of a company?” In order to answer this question, data were collected to measure the financial indicators. As explained in par. 2.5.1 above, the variable for the empirical study, namely financial ratios, was analysed to measure the financial indicators. The data to analyse the financial ratio were collected from the financial statements of the various companies.

Financial ratios were analysed for the years 2014 – 2017. The researcher selected 2017 as the last year, seeing that not all the data on 2018 financial ratios were available at November 2018. (According to the South Africa 2008 Company's Act No. 71 of 2008 companies are allowed six months to prepare their financial statements subsequent to the end of their financial year- end.) In addition, 2014 was selected as the first year since the IIRF was only published in December 2013 (see par. 1.1.1). As a result, companies could only have used this framework to assist with their IRG from the financial year 2014 onwards. The 2015 EY’s EIRAs ranked companies based on their market capitalisation at 31 December 2014. These were also the first EIRAs which were covered by a marking plan based on the “Guiding Principles and Content Elements that appeared in the IIRF” (EY, 2015:25-26), as was explained in par. 2.6.

It is important to note that certain companies as part of the sample were listed only in 2016 on the JSE. Thus, data, on financial ratios for the periods prior to the listing of these companies were not publicly obtainable. As a result, the present study did not analyse data on financial ratios for certain years for these companies. Table 3.8 below summarises the instances where the data on financial ratios were available (or not) for the research sample.

Table 3.8 Availability of financial ratio data

Company identification (EY, 2018:6)	Sector (JSE, 2018a)	Ranking according to EY: Excellent (4), Good (3), Average (2) or Progress to be made (1) (EY, 2018:6)	2014	2015	2016	2017	Date of listing	Number of observations (n)
AECI Limited	Basic materials	1	✔	✔	✔	✔		4
Anheuser-Busch Inbev NV/SA	Consumer goods	1	✘	✔	✔	✔	Listed on 15/01/2016 (Anheuser-Busch - ANH was previously the same company but with a different code - ANB (which was listed on 23 November 2015) and therefore the availability of financial data from 2015 (Wykerd, 2018b)).	3
Aspen Pharmacare Holdings Ltd	Health care	4	✔	✔	✔	✔		4
Astral Foods Ltd	Consumer goods	2	✔	✔	✔	✔		4
AVI Ltd	Consumer goods	1	✔	✔	✔	✔		4
Barloworld Ltd	Industrials	3	✔	✔	✔	✔		4
Bid Corporation Ltd	Consumer services	1	✘	✘	✔	✔	Listed on 30/05/2016	2
Blue Label Telecoms Ltd	Telecommunications	1	✔	✔	✔	✔		4
British American Tobacco plc	Consumer goods	3	✔	✔	✔	✔		4
Clicks Group Ltd	Consumer services	3	✔	✔	✔	✔		4
Compagnie Financière Richemont SA	Consumer goods	1	✔	✔	✔	✔		4

Table 3.8 Availability of financial ratio data (continues)

Company identification (EY, 2018:6)	Sector (JSE, 2018a)	Ranking according to EY: Excellent (4), Good (3), Average (2) or Progress to be made (1) (EY, 2018:6)	2014	2015	2016	2017	Date of listing	Number of observations (n)
Curro Holdings Ltd	Consumer services	2	✔	✔	✔	✔		4
Datatec Ltd	Technology	1	✔	✔	✔	✔		4
Dis-Chem Pharmacies Ltd	Consumer services	2	✘	✘	✘	✔	Listed on 18/11/2016	1
Distell Group Ltd	Consumer goods	3	✔	✔	✔	✔		4
Imperial Holdings Ltd	Industrials	2	✔	✔	✔	✔		4
Italtile Ltd	Consumer services	1	✔	✔	✔	✔		4
KAP Industrial Holdings Ltd	Industrials	1	✔	✔	✔	✔		4
Life Healthcare Group Holdings Ltd	Health care	4	✔	✔	✔	✔		4
Massmart Holdings Ltd	Consumer services	3	✔	✔	✔	✔		4
Mediclinic International Plc	Health care	3	✘	✘	✔	✔	Listed on 08/02/2016	2
Mondi plc	Basic materials	3	✔	✔	✔	✔		4
Mr Price Group Ltd	Consumer services	3	✔	✔	✔	✔		4
MTN Group Ltd	Telecommunications	4	✔	✔	✔	✔		4
Naspers Ltd	Consumer services	1	✔	✔	✔	✔		4
Netcare Ltd	Health care	4	✔	✔	✔	✔		4
Oceana Group Ltd	Consumer goods	4	✔	✔	✔	✔		4
Pick n Pay Stores Ltd	Consumer services	4	✔	✔	✔	✔		4
Pioneer Food Group Ltd	Consumer goods	2	✔	✔	✔	✔		4
RCL Foods Ltd	Consumer goods	2	✔	✔	✔	✔		4
Remgro Ltd	Industrials	2	✔	✔	✔	✔		4
Reunert Ltd	Industrials	4	✔	✔	✔	✔		4
Sappi Ltd	Basic materials	3	✔	✔	✔	✔		4

Table 3.8 Availability of financial ratio data (continues)

Company identification (EY, 2018:6)	Sector (JSE, 2018a)	Ranking according to EY: Excellent (4), Good (3), Average (2) or Progress to be made (1) (EY, 2018:6)	2014	2015	2016	2017	Date of listing	Number of observations (n)
Sasol Ltd	Basic materials	4	✔	✔	✔	✔		4
Shoprite Holdings Ltd	Consumer services	2	✔	✔	✔	✔		4
Super Group Ltd	Industrials	1	✔	✔	✔	✔		4
Telkom SA SOC Ltd	Telecommunications	4	✔	✔	✔	✔		4
The Bidvest Group Ltd	Industrials	2	✔	✔	✔	✔		4
The Foschini Group Ltd	Consumer services	3	✔	✔	✔	✔		4
The Spar Group Ltd	Consumer services	2	✔	✔	✔	✔		4
Tiger Brands Ltd	Consumer goods	2	✔	✔	✔	✔		4
Tongaat Hulett Ltd	Consumer goods	3	✔	✔	✔	✔		4
Truworths International Ltd	Consumer services	4	✔	✔	✔	✔		4
Tsogo Sun Holdings Ltd	Consumer services	3	✔	✔	✔	✔		4
Vodacom Group Ltd	Telecommunications	4	✔	✔	✔	✔		4
Woolworths Holdings Ltd	Consumer services	4	✔	✔	✔	✔		4
							Total observations:	**176**

Sources: EY (2018:6) and JSE (2018a)

As can be deduced from Table 3.8 above, certain companies listed only subsequent to 2014. The data for these companies was therefore not examined for the full period of 2014 – 2017. The listing date was obtained per e-mail from a contact person (Sales Support Administrator from Information Services/Market Data) at the JSE itself on 27 and 28 November 2018. The following section indicates how the data on financial ratios were collected. In the present study, the crucial variable is the financial ratios. (Par. 2.5 explained in detail why certain financial ratios were selected for the analysis.)

Hossari (2006:31) argues that "ratio-based data is better", and add that the use of financial ratios decreases the inconsistency of data. According to Barnes (1987:449), it is assumed that ratios have appropriate statistical qualities since it can process and summarise data. Of the financial ratios that can be captured from data on financial statements, certain ratios provided the necessary information for the data analysis in this study. The mentioned ones are the 20 financial ratios, as well as the market capitalisation figure (which indicates the market value or size of the company), as explained in par. 2.5 and presented in Table 3.9 below.

Table 3.9 Data collected: 21 Formulas

Formula #	Ratio/description of formula
1	Inventory turnover
2	Average debtors collection period
3	Fixed-asset turnover
4	Total asset turnover
5	Times interest earned
6	EBITDA
7	Fixed charge coverage
8	Dividend yield
9	Earnings yield
10	Price-earnings
11	Dividend cover
12	Gross profit %
13	Net profit %
14	EBITDA margin
15	Net operating profit after tax
16	Return on capital employed
17	Return on invested capital
18	Return on equity
19	Debt ratio
20	Debt to equity
21	Market capitalisation

Most of these ratios were readily accessible from the reputable IRESS database. Formulas # 7 and 17 were not available on IRESS. Furthermore, companies may have discloses the numerator and denominator figures differently. Therefore, the researcher did not calculate

these two formulas from the financial statements of the designated companies since it may have delivered inconsistent data. Consequently, only the data for 19 formulas were acquired.

Five other ratios were also unavailable on the IRESS database, but their respective numerators and denominators could be used. The mentioned five ratios were calculated by using the numerator and denominator obtained from IRESS. These five formulas are shown in Table 3.10 below.

Table 3.10 Formulas calculated by researcher

Formula #	Ratio	Numerator as per IRESS IRESS (2019)	Denominator as per IRESS (2019)
1	Inventory turnover	Cost of sales	Inventory (year-end balance)
2	Average debtors collection period	See explanation below	
3	Fixed-asset turnover	Fixed assets	Turnover
12	Gross profit %	Gross profit	Turnover
14	EBITDA margin	Earnings before interest, tax, depreciation and amortisation	Turnover

It should be noted that the accounts' receivable turnover ratio is provided on the IRESS database as turnover/debtors. Therefore to calculate debtors only, total turnover was divided by the accounts' receivable turnover ratio. Thereafter, debtors were divided by total turnover and multiplied by 365 to ascertain the average period for debtors' collection. Total turnover was used instead of credit sales since the latter was not provided separately on IRESS.

Regarding the yield of dividends and earnings as well as the price-earnings formula, the data from the IRESS database were gathered at year-end for the 'per share' numerator and denominator. Furthermore, the headline-earnings per share were used where earnings per share functioned as a numerator or denominator. IRESS uses ordinary dividends plus retained profits as its net earnings as the numerator for the dividend cover formula.

Once the financial ratios were obtained from IRESS and calculated in MS Excel as stated above, the data were prepared to be analysed with the statistical package, Statistica Version 13.3. (The quantitative analysis of the ratios that were applied will be explained in more detail in chapter 4.) Thereafter, the collected data on financial ratios were analysed from the selected companies for the period to be examined. The following paragraph explains the techniques of data analysis applied in this study.

3.5.4 Data analysis

Bless *et al.* (2006:163) point out that after data collection, the analysis process follows. According to Zikmund *et al.* (2013:68), data analysis is the "application of reasoning to understand the data that have been gathered". Grove, Burns and Gray (2013:46) explain the aim of data analyses as: to decrease, organise and make sense of the data. After the collection process, irrelevant data are removed, which leave only the data critical to the research problem to be analysed (Brynard & Hanekom, 2006:62). Mouton (2001:108) points out that data analysis involves the splitting of information into manageable patterns, relationships, themes and trends in order to understand the content.

The present study applied three statistical methods, which are explained in the following paragraphs:

3.5.4.1 Descriptive statistics – analysis of financial ratios taken over four years regarding rankings of companies according to EY's EIRAs.

3.5.4.2 Spearman's rank-order correlation technique – analyses the strength between the related ratios when considering EY's ranking of companies for the EIRAs.

3.5.4.3 Repeated measures analysis of variance (ANOVA) – analyse the relationship between the ratios for different EIRAs' rankings of companies over the period 2014 – 2017.

3.5.4.1 Descriptive statistics

Welman *et al.* (2005:231) explain that descriptive statistics summarise and/or describe data collected for a group of distinct characteristics to analyse. From a different angle, Tabachnick and Fidell (2014:39) define descriptive statistics as the explanation of samples of matters in terms of specific or groupings of variables. Descriptive statistics have numerous uses such as describing the sample's characteristics in the method section of the report or inspecting the variables for possible deviation from the assumptions (Pallant, 2010:53). The latter ground the statistical methods that researchers employ to answer or address particular research questions (Pallant, 2010:53). A univariate analysis entails the use of a single variable in a study, whereas a bivariate analysis indicates the involvement of two variables (Welman *et al.*, 2005:231). The bivariate analysis is applicable to the present study, seeing that the two variables are the IRG ranking and the financial indicators.

It is vital that assumptions made by the individual tests are not transgressed before any statistical analysis can be conducted (e.g. the correlation or ANOVA as done in this study) (Pallant, 2010:53). Pallant (2010:53) explains that the testing of these assumptions typically means applying descriptive statistics to variables such as the "mean, standards deviation,

range of scores, skewness and kurtosis". Welman *et al.* (2005:233) define the mean as the "arithmetical average of a set of scores", which is represented by X. The mean is calculated as the total calculated from the various scores divided by the entire number of scores (Welman *et al.*, 2005:230). Welman *et al.* (2005:233) add that the standard deviation measures the "spread of scores about the mean". The broader the spread, the more distant are the scores dispersed from the mean (Welman *et al.*, 2005:233). Tabachnick and Fidell (2014:70) explain that the standard deviation measures variability, which is "in the metric of" the initial scores. Approximately 68% of scores that are generally spread fall between one standard deviation to either sides of the mean (Welman *et al.*, 2005:233).

The standard deviation determines whether scores on a parametric test are dispersed equally and grouped nearby the mean (Welman *et al.*, 2005:230). The standard error is very similar than the standard deviation (Statistics how to, 2019). Both calculations measure a range or spread; the lower the number, the less spread-out the data (Statistics how to, 2019). The difference between the two measures is that the standard deviations use parameters (population data), whereas the standard error is based on statistics (sample data) (Statistics how to, 2019). In other words, the standard error implies the projected standard deviation of a "statistical sample population" (Investopedia, 2019).

As explained in chapter 2, the financial ratios were analysed to collect the necessary data. Ratio analysis is included in repeated measures of ANOVA. The present study utilised the technique of a trend-ratio analysis. A trend analysis was done, since Lucouw (2013:71) cautions that merely analysis without a benchmark adds little value.

3.5.4.2 Correlation technique

Pallant (2010:124) and Zikmund *et al.* (2013:561) explain 'correlation technique' as determining whether there is a relationship between two variables. According to Zikmund *et al.* (2013:561), this is a highly favoured technique in research. Levin and Rubin (1991:505) explain that correlation describes the level to which variables are linked linearly to each other. A correlation coefficient is a "statistical measure of the covariation', or connection, amongst two variables" (Welman *et al.*, 2005; Zikmund *et al.*, 2013:561).

Relevant to the present study, correlation was measured by applying the Spearman rank-order correlation technique. Spearman's technique is a method that researchers use to assess the strength of the association between two continuous variables, in case of the present study, IR ranking and the financial indicators (Pallant, 2010:103). Both the direction (negative or positive) and the power of the relationship are indicated by the mentioned correlation technique (Pallant, 2010:103).

In certain instances it may commonly occur that the data are not normally distributed instead of almost normal (Bishara & Hittner, 2015:1). This non-normality of data may cause the correlation coefficient to be overstated by up to +.14 (Bishara & Hittner, 2015:1). Spearman as correlation technique removes this inflation and offers more conservative estimates (Bishara & Hittner, 2015:1). Field (2009:179) defines Spearman's technique as a non-parametric statistic, r_s, that "can be used when the data have valuated parametric assumptions such as non-normally distributed data". As Spearman's correlation does not require normality of data, it is a superior statistical method.

Welman *et al.* (2005:229) point out that the Spearman technique should be used when both variables, namely the EY ranking of the IR and the financial ratios, are "ordinal". The ordinal level of measurement implies ordering when measuring data (Statistics Solutions, 2019). Qualitative data entails information that is not numerical (Steyn, Smit, Du Toit & Strasheim, 1996:7), but can be represented in a quantitative way (Steyn *et al.*, 1996:7). This was done in par. 4.5 when the four respective EY rankings were assigned a number, namely rating 1 to 4. There is a definite order in the categories and therefore the variable of 'EY ranking' can be considered as ordinal data. The financial ratios are viewed as quantitative data since it can be measured on a numerical scale (Steyn *et al.*, 1996:7).

Researchers use the ratio scale, the top level of measurement, to categorise, rank items in an order and compare intervals (Business Jargons, 2019). All the characteristics of the ordinal scale are retained in the ratio scale; furthermore, this scale also has a "true zero point or origin characteristic" (Business Jargons, 2019). Zero point enables the calculation of ratios for the scale values (Business Jargons, 2019). This is the most informative scale since it indicates the order and the amount of objects within the values which the scale measures (Business Jargons, 2019). Statistics Solutions (2019) points out that these levels of measurement are considerably more precise. A researcher can use the ratio scales for various statistical techniques such as coefficient of variation (Business Jargons, 2019). The financial ratios variable, as applicable to the present study, is ordinal, thus it can be measured on a ratio scale.

If increase in one variable warrants increase in another, there is a positive correlation (Pallant, 2010:103). On the other hand, if one variable declines, but the other variable increases, this indicates a negative correlation (Pallant, 2010:103). Correlation coefficients provide a value between – 1 and 1 (Field, 2009:170). Field (2009:170) explains that a value of 1 indicates a perfectly positively correlated relationship, and –1 the perfect negative relationship. A correlation coefficient below 0.3 indicates a small effect, between 0.3 and 0.5 a medium effect and above 0.5 points to a large effect (Field, 2009:170).

The second statistical technique applied by the present study was to evaluate the strength and trend of possible correlations. The above-mentioned Spearman correlation technique was used particularly to analyse how strongly the four years' ratios within the three financial indicator categories (financial performance, risk and growth) are related to the IRG rankings. Financial ratios were compared to determine the relationship between the two variables, namely, IRG ranking and the financial indicators (correlation), after which the significance of the correlation was investigated in detail.

3.5.4.3 Repeated measures ANOVA

An ANOVA (analysis of variance) is used to analyse variance in a data set (Laerd Statistics, 2018a). Zikmund *et al.* (2013:542) and Tabachnick and Fidell (2014:69) explain that this analysis is done to compare two or more means and determine possible statistically significant differences. Therefore, ANOVA consists of certain analytical procedures to compare estimates of variance.

Field (2009:458) and Laerd Statistics (2018b) state that the repeated measures ANOVA apply when the same elements are tested under various circumstances. Field (2009:793) elaborates on repeated measures ANOVA as an "analysis of variance conducted on any design in which the independent variable (predictor) or variables (predictors) have all been measured using the same participants in all conditions". Pallant (2010:258) explains this form of ANOVA as a design where each variable is exposed to more than one condition, or analysed on a similar, continuous scale on three or more instances.

By using this design for the present study, the researcher anticipated scores in the various years to be non-independent for each company but the performance between the various EY ranking and ratios should be independent. This means ratios are calculated individually and not interrelated. The reason is that ratios of different companies in various EY ranking groups were analysed independent of one another. In the present study, the repeated measures ANOVA was used to analyse the same financial ratios between various years and IRG rankings.

Repeated measures ANOVA delivers an F-statistic or F-ratio, seeing that it compares the amount of systemic variance in the information, to that of unsystemic variance. (Field, 2009:349). According to Field (2009:349), "F is the ratio of the model variance to its error variance." The F-test assumes that scores in various conditions are independent (Field, 2009:359).

It has been established that as samples increase (typically above 30), the "sampling distribution has a normal distribution with a mean equal to the population mean, and a standard deviation of the population divided by the square root of the sample size" (Field,

2009:42). In other words, large samples will follow normal distribution, irrespective of the nature of the population from which the sample was selected (Field, 2009:782). This form of distribution is acknowledged as the central limit theorem (Field, 2009:42). This theorem is valuable and indicates that if a large sample is included in a study, the equation above can be applied to estimate the standard error ("the standard deviation of the sampling distribution") (Field, 2009:42). Early research indicated that for studies with samples of 40, the distribution was normal – as anticipated (Games, 1984, as cited by (Field, 2009:156)). The sample size of the present study was 46, which is therefore large enough for the distribution to be considered as normal. The repeated measures ANOVA used in this study, determine averages over time from a large data set. Therefore, the central limit theorem is applicable: averages will be normal if the data set is large enough, as explain above.

A trend analysis were done through repeated measures ANOVA. Trend analysis is done to conclude on the direction of a company's trends (Cassim, 2014:80). Brigham and Ehrhardt (2007:464) argue that ratios should be plotted over the period under review as this approach determines whether the financial health of a company has improved or deteriorated over time. Correia (2015:5-13) points out that trend analysis requires the financial information of numerous years to suggest the direction of change to which a company may be headed. Cassim (2014:80) states that examining a single year's financial information will not provide the whole picture since companies' profits change yearly. According to Correia (2015:5-13), the financial information must be available over a desired period of at least five to ten years. For the present study, the financial information spanning four years were evaluated, seeing that the year 2017 was carefully chosen as the last entry. As mentioned, the reason was that not all the data of the financial ratios for 2018 were available at November 2018. Likewise, 2014 was selected as the first year since the IIRF was only published in December 2013. Therefore, it is evident that companies could only have used the framework to assist with their IRG from the year 2014 onwards (see par. 1.5.3). Future predictions can only be made by examining changes in the past to identify possible trends (Cassim, 2014:80).

Lucouw (2013:71) points out, however, that limited information is provided if the trend analysis is lacking a reference base and for a growing trend this is not necessarily favourable. An upwards trend is not automatically a positive sign since the comparison with other companies that show uncertain benchmark quality, will provide limited value (Lucouw, 2013:71). Block, Hirt and Danielsen (2009:63) add that the whole picture is not provided if there is no available benchmark. In the present study, the 2013 financial year was chosen as benchmark instead of the other years, seeing that the IIRF with its IR guidelines was only published in December 2013.

Tuvadaratragool (2013:92) reports that trend analysis is used broadly in various environments such as consumer behaviour, business planning, education, health, and politics. Correia (2015:5-13) views this approach as “important for analysts”, seeing that it can help predict results in future. Marx and De Swardt (2013:67) advise that financial and environmental changes must be considered when the financial indicators of a company are examined over various years. When applying trend analysis, the present study used the same ratios as for analysing comparative ratios. The first of the four years under review, also known as the base year, was the starting point where financial indicators of the companies were compared to financial indicators from other periods.

As mentioned previously, the researcher selected 20 ratios as well as the market capitalisation figure. These elements were classified under asset management, debt management, market and profitability ratios. The mentioned ratios also fall within the three categories of financial indicators (financial performance, risk and growth). As explained previously, certain companies did not have information available on financial ratios for the whole period under review. Thus, only the identified financial ratios were used to generate comparable figures from the populated data.

The three selected statistical methods, as explained in this paragraph, were found adequate to determine the effect of IRG on companies’ financial indicators. The selection of these statistical methods is in accordance with similar studies (see Table 2.2). Statistica Version 13.3 was used to perform the relevant statistical methods reported in chapter 4. The following paragraph explains the methods to reach valid and reliable data.

3.5.5 Validity and reliability of data

The reliability and validity of data are essential in all forms of measurement (Neuman, 2011:207). Validity advocates “truthfulness” (Neuman, 2011:208). According to Bless *et al.* (2006:156) validity relates to what is being measured as well as the actual meaning of results. Field (2009:11) add that validity considers whehter an instrument really measures what it was intended to. In this regard, Zikmund *et al.* (2013:303) define validity as “the accuracy of a measure” or how truthfully a score characterises an idea. Litwin (1995:34) emphasises that validity must be documented since it is an essential measure of a research instrument's accuracy. From the explications above, it can be concluded that validity measures whether the results can be considered as a truthful representation of the research question.

Validity

Bless *et al.* (2006:156-160) identify five types of validity: content, criterion-related, construct, convergent, and face validity, all of which are explicated below.

Content validity: Considers the degree to which a measure covers the area of interest (Zikmund *et al.*, 2013:303). If an instrument measures all the various elements of the variable in a study, it can be accepted that the instrument has high content validity (Bless *et al.*, 2006:157).

Criterion-related: Compares how well one measure compares with the outcome of another (Bless *et al.*, 2006:157). This can either be tested through predictive validity (whether it accurately predicts what it is supposed to) or concurrent validity (data on the instrument being tested and the criterion measure collected simultaneously) (Bless *et al.*, 2006:158).

Construct: Takes place when the measurement truthfully characterises a specific idea (Zikmund *et al.*, 2013:303)

Convergent: Measures the "relationship between the scale used and other scales that are intended to measure the same construct" (Bless *et al.*, 2006:159-160). High convergent validity is achieved when there is a strong association amongst instruments that measure the same construct (Bless *et al.*, 2006:160).

Face: Entails the impression the instrument leaves on the participant (Bless *et al.*, 2006:160); whether test elements make sense given the concept (Zikmund *et al.*, 2013:303).

Four of these types of validity were applicable to the present study. For content validity, several ratios of various groups were selected, therefore the analysis covered all the financial indicators. Concurrent criterion validity was achieved since the study examined the ranking and the ratios simultaneously. Construct validity were reached since the ratio analysis truthfully represents the financial indicators. On the other hand, convergent validity did not apply, seeing that the same construct was not measured, but different financial indicators. Face validity could be considered since the financial ratios made sense in testing the financial indicators.

Reliability

Reliability, in turn, indicates whether measures are consistent (Bless *et al.*, 2006:151). Davis (2000:179) points out that validity relates to accuracy. A measure is considered reliable when an identical event recurs under identical or very similar conditions, which ensures trustworthy results (Brynard & Hanekom, 2006; Neuman, 2011:208). According to Field (2009:11), reliability measures the consistency of results by a research instrument for multiple conditions. Similarly, for Babbie (2012:64) reliability implies the possibility to reach the same results under similar circumstances. Therefore, it can be inferred that reliability refer to a research instrument's ability to measure research results correctly and constantly.

Data were processed to measure the objectives as indicated in par. 1.4.2. The same statistical methods were applied by a consistent analysis of financial ratios of all the companies included in the sample. As stated in par. 1.5.6, the data for the financial ratio analysis were collected from IRESS, listed on the Australian Stock Exchange (Australian Stock Exchange, 2018). IRESS is a technology company similar to Reuter's and Bloomberg that offers several services and information such as "market data, trading solutions and wealth management systems" (Wykerd, 2018a).

The researcher acquired significant information from the head of sales and client services, as well as directly from a client relationship manager from IRESS. According to these sources, IRESS, originating from June 1993, has acquired 100% of INET BFA in South Africa in September 2016 (Campbell, 2018; Wykerd, 2018a). INET BFA, a supplier of data and software vendor, has reputable market data coverage that adds value to IRESS's integrated trading and portfolio services (Campbell, 2018). INET Bridge and McGregor BFA had formerly merged to establish INET BFA (Campbell, 2018).

The gathered data were analysed using the Statistica Version 13.3. Statistica can analyse data correctly by applying any selection of statistical techniques (Statsoft.Com, 2018). An independent skilled statistician provided advice on methods to compile the statistical evidence and supported the researcher in analysing the data. The standards of both validity and reliability were met since the information were attained through a portal which is considered a trustworthy database – the obtained ratios provided reliable information. Thus, the gathered data for the study are accessible, correct and freely available. The ratios were calculated in a reliable manner. This was done according to the ratios deeply rooted in existing literature (see par. 2.5.1). Based on the explications above, the collection and analysis of data could be seen as valid and reliable, since the research data obtained are accurate and consistent.

3.5.6 Ethical considerations

Welman *et al.* (2005:181) point out that ethical conduct is important when doing research. Ethics in research outlines what is appropriate and what is not when following research procedures (Neuman, 2011:143). Mouton (2001:238) states simply that ethics in research indicates what is wrong or right. A highly ethical study can be seen as "fair, just and acceptable" (Zikmund *et al.*, 2013:88). In addition, research participants should be treated in a unthreatening and thoughtful way (Bless *et al.*, 2006:140).

Mouton (2001:240) cautions that researchers should always aim for objectivity and integrity. This should be done by following the ethical standards in research, specifying limitations of results, articulating the judgements truthfully, and disclosing findings to ensure results do not

misrepresent the data collected. Research should be carried out in an honest way (Welman *et al.*, 2005:181).

The present study did not use research participants to complete a survey, to be interviewed or be involved in any other manner, therefore limited possible ethical issues existed. Secondary data were used (see par. 3.4), which are considered unrestricted, easily available knowledge. The research was approved by the Economic and Management Sciences Research Ethics Committee from North-West University. The researcher also specified the research findings and limitations objectively.

3.6 CHAPTER SUMMARY

As is evident from the discussion above, research designs and methods are important when conducting research. Such groundwork will ensure the results of the study are accurate, reliable and relevant. Chapter 3 provided an overview of the research design and methodologies relevant to this study.

The aim of this chapter was firstly to identify the research process. This process typically comprises four phases: providing the research problem; identifying the research design; establishing the applicable research methodology; and documenting research results. This chapter discussed the first three stages in the process, seeing that the research results will be documented in chapter 4.

For the first stage, a research problem was defined and discussed after which the problem of this study was stated. The second stage explained the research design in terms of Mouton's four dimensions. It became apparent that the present research entailed a medium controlled empirical study focusing on a combination of textual and numerical secondary data.

The third stage considered the research design and methodology. The form of design was identified as explanatory, applied research based on the mixed method approach. The population was indicated as all Johannesburg Stock Exchange (JSE) -listed companies. Thereafter judgment sampling was used to select the top 100 JSE-listed companies based on their market capitalisation as at 31 December 2017 according to the EY's Excellence in Integrated Reporting Awards (EIRAs) for 2018. These mentioned top 100 companies were further sampled through judgment to exclude the companies of industrial metals and mining within the basic materials industry, as well as the financial industry.

After applying two judgment sampling filters, a sample of 46 companies was obtained. Information on the financial ratios to be analysed were collected from IRESS. Three statistical methods were applied in this study: descriptive statistics, Spearman's rank-order correlation technique, and repeated measures ANOVA. The Statistica software package was used to

analyse the collected data. It was concluded that this study fulfils the necessary requirements for validity and reliability. Finally, the ethical considerations were emphasised and it was concluded that this study was performed at a high ethical standard.

The following chapter (ch 4) analyses and interprets the gathered data, by using the ratio trend analysis and comparative ratio analysis over the four consecutive years under review. The research findings that control the outcome of the study are also presented in detail.

CHAPTER 4

DATA ANALYSIS

"You can't manage what you can't measure." William 'Bill' Hewlett (cited by (Higgins, 2012:37).

4.1 INTRODUCTION

According to the International Integrated Reporting Committee (IIRC (2013:4), the main drive for an integrated report (IR) is giving details to the providers of financial resources of a company on the way that the company generates value over a period of time. The IIRC (2013:10) elaborates that value generated by a company over time is illustrated by the "increases, decreases or transformations of the capitals caused by the organisation's business activities and outputs". As explained in chapter 1, the present study focused specifically on the financial capital. It remains unclear what impact the implementation of integrated reporting (IRG) may have on a company's financial capital.

The main objective of this research was to determine the effect of IRG on financial indicators of the selected companies. To reach the primary objective, the following empirical secondary objective was conveyed for the present study:

- Determine the effect of IRG on financial indicators by analysing the financial indicators of Johannesburg Stock Exchange (JSE) -listed companies.

This study therefore analysed secondary data obtained from IRESS of selected JSE- listed companies (as per Table 3.8), thereby reaching the empirical objective as stated above. A quantitative research methodology was used to accomplish the empirical objective and to gain a more profound understanding of the effects that IRG has on financial indicators.

Three statistical approaches are applied in this chapter, as discussed in par. 3.5.4 previously:

a. Descriptive statistics – analysis of financial ratios taken over four years regarding rankings of companies according to EY's EIRAs.

b. Spearman's rank-order correlation technique – analyses the strength between the related ratios when considering EY's ranking of companies for the EIRAs.

c. Repeated measures analysis of variance (ANOVA) – analyse the relationship between the ratios for different EIRAs' rankings of companies over the period 2014 – 2017.

Statistical information was acquired by using the Statistica Version 13.3 software package. Statistical methods were applied to the top 100 JSE-listed companies as identified in

par. 3.5.2.2. The sample consisted of 176 observations for the period 2014 – 2017. These observations were summarised in Table 3.8 previously.

Welman *et al.* (2005:210) emphasise that data analysis and interpretation, including the publication of the findings, are the most important stages of the research process. Mouton (2001:108) adds that investigation typically concludes with analysing and interpreting a certain set of data. Mouton (2001:108) explains data analysis as the "breaking up" of data into managable forms to understand the relevant gathered information. Cassim (2014:85) stresses the importance of appropriate input recording to ensure an appropriate output. If the input is poor, the output will also be deficient, resulting in inappropriate findings and skewed interpretations Cassim (2014:85). Zikmund *et al.* (2013:459) elaborate that inadequate findings will be reached if data are collected incorrectly or entered poorly. The aim of this chapter is to transform the raw collected data – the unedited gathered information – into intelligence, through data analysis (Zikmund *et al.*, 2013:459).

The following paragraph offers a detailed layout of the data analysis done by applying certain statistical methods to the above-mentioned observations.

4.2 LAYOUT OF DATA ANALYSIS

As explained in chapter 3, the identified research design is a medium controlled empirical study based on numerical secondary data. Bless *et al.* (2006:3) refer to empirical research as observations made in nature that serves as the basis of knowledge. Empirical findings involve new discoveries of facts or confirming the presence of a phenomenon (Mouton, 2001:113). In line with the objective of the present study, the impact of IRG on the financial indicators of a company was observed. This was done to evaluate the postulate that IRG creates value for a company over time. For data to be analysed, statistical observations were structured systematically. Table 4.1 below indicates how the data analysis were set out in the paragraphs to follow:

Table 4.1 Outline of data analysis

Data analysis	Paragraph to be discussed
Descriptive statistics	Par. 4.3
Correlation technique	Par. 4.4
Repeated measures ANOVA	Par. 4.5
Final results interpretation	Par. 4.6

First, this chapter describes the dataset containing the variables (descriptive statistics). Thereafter, it indicates Spearman's rank-order correlation technique. Finally, the repeated measures ANOVA are explained. Tables and graphs are presented to illustrate the findings.

The following paragraphs investigates the data analysis per se, by applying descriptive statistics, the first of the three statistical methods used in this study. The statistical methods for the sampled JSE-listed companies from 2014 – 2017 are presented in the paragraphs to follow. This enabled the researcher to interpret the data and draw relevant conclusions.

4.3 DESCRIPTIVE STATISTICS

In the first phase, a descriptive analysis was done. This implied an in-depth study to recognise the patterns and characteristics of the variables. The aim of the analysis was to understand the analysis of financial ratios by comparing ratios over four years with EY's EIRAs' rankings. It should be noted that rankings according to EIRAs, IRG and EY are equivalent; thus, the three words will be used alternatively. Pallant (2010:53) explains that prior to performing ANOVA (in this case repeated measures), correlation or other statistical analysis, it is essential to avoid transgression of 'assumptions' made by the individual tests. This typically involves applying descriptive statistics to the variables (Pallant, 2010:53). Tabachnick and Fidell (2014:39) outline that the method of descriptive statistics provides a detailed account of "samples of subjects in terms of variables or combinations of variables".

For the present study, as explained in par. 3.5.4, the identified dependent variables are the financial indicators, and the independent variables the IRG ranking of the sampled companies. To conduct the statistical analysis, the qualitative rating scale had to be converted to a numerical scale. As the rating scale was ordered, numbers 1 to 4 were allocated as shown in Table 4.2 below.

Table 4.2 Ordering of rating scale

EIRA ranking	As per table 'Rating'	Amount of companies with ranking in 2018
Progress to be made	1	11
Average	2	11
Good	3	12
Excellent	4	12

Source: Own research

Table 4.2 above indicates that the spread of the sample over the four categories were similar; the IR's of 11 companies were ranked as 'Progress to be made' and 11 as 'Average' in 2018, whereas 12 companies' IRs were ranked 'Good' and another 12 as 'Excellent'.

The mean and standard error were explained in par. 3.5.4. In Tables 4.3 to 4.7 below the 'Mean' column provides the average figure and the 'Standard error' column indicates the standard deviation from the mean. The mean specifies the average ratio figure, therefore,

most of the time, if the mean increases annually, this indicates that the ratio has improved and vice versa. For certain ratios such as the average debtors collection period as well as the debt to equity and debt ratios, the mean would need to decrease to show improvement. The standard error's impact must also be taken into account when interpreting means. Table 4.3 below reports the descriptive statistics of the four formulas included in the class of asset management ratios (see Table 2.5 previously).

Table 4.3 Descriptive statistics of ratios included in asset management class over time for each ranking category

Rating	Year	Formula 1 Inventory turnover		Formula 2 Average debtors collection period		Formula 3 Fixed-asset turnover		Formula 4 Total asset turnover	
		Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err
1	**2014**	6.01	1.83	69.00	13.12	34.52	10.49	1.31	0.31
1	**2015**	5.94	2.19	75.33	15.80	34.40	10.73	1.28	0.33
1	**2016**	6.59	1.99	65.98	11.71	41.63	13.31	1.37	0.36
1	**2017**	7.13	2.20	74.21	13.12	38.53	12.12	1.25	0.32
2	**2014**	7.25	1.73	47.92	12.45	6.69	9.95	1.64	0.30
2	**2015**	7.10	2.08	56.39	14.99	7.28	10.18	1.72	0.31
2	**2016**	6.32	1.89	48.71	11.11	7.24	12.63	1.91	0.34
2	**2017**	6.84	2.08	55.74	12.45	6.06	11.50	1.59	0.30
3	**2014**	3.86	1.65	57.70	11.87	7.12	9.49	1.40	0.28
3	**2015**	3.62	1.98	63.37	14.29	6.83	9.70	1.32	0.30
3	**2016**	3.85	1.80	59.55	10.59	6.31	12.04	1.39	0.32
3	**2017**	3.94	1.99	62.04	11.87	5.93	10.96	1.33	0.29
4	**2014**	4.76	1.58	78.55	11.36	6.73	9.09	1.37	0.27
4	**2015**	7.35	1.89	77.52	13.68	5.19	9.29	1.16	0.29
4	**2016**	6.35	1.72	77.33	10.14	4.79	11.53	1.12	0.31
4	**2017**	6.58	1.90	73.68	11.36	4.93	10.50	1.13	0.27

Source: Own research adopted from IRESS 2014-2017

Regarding the inventory turnover ratio in particular, rating 2 (Average) provided the highest means of the four ratings (ranging between 6.32 and 7.25). Companies with a rating 3 (Good) have on average much lower scores than the other ratings (between 3.62 and 3.94) for their respective yearly means. The standard error for all years and ratings were found to be fairly similar, between 1.58 and 2.2.

The ratio of the average debtors collection period should decrease to indicate improvement. The means of rating-2 companies are on average the lowest, thus the best, seeing that these companies have a shorter period to collect debt. The companies rated 'Excellent' had the highest means, therefore the worst ratio on average since these companies have the longest debt collection period. The standard error for the ratio of an average collection period for

debtors ranged between 10.14 and 15.80, maintaining the same pattern in comparison to the mean figures.

When analysing the means of the fixed-asset ratio, it is evident that the mean of companies with rating 1 is by far the highest, scoring between 34.40 and 41.63. All the other ratings for this ratio provided a significant lower similar means, between 4.79 and 7.28 with rating 4 showing the lowest means. These findings are significant since it shows that the best EIRAs' rating obtained the lowest ratios, whereas the worst EIRAs' rating provided the best fixed asset ratios by far. Especially for the latter ratio, it is crucial to consider standard error. Rating-1 companies indicate basically the same standard error as the other 3 rankings – all of whom have extremely low ratio averages. Thus, seemingly the means of rating-2 to -4 companies are widely dispersed around the average mean.

The total assets turnover ratio indicated that the means of all ratings are essentially equal between 1.12 and 1.91. A standard error figure can be observed of between 0.27 and 0.36. However, the aforementioned turnover ratio is insignificant since all the means are so close to each other.

Table 4.4 below reports descriptive statistics of four of the five formulas included in ratios for the debt management class. Formula 7, the ratio of fixed charges covered, was excluded since the data were unavailable on IRESS (see par. 3.5.3).

Table 4.4 Descriptive statistics of ratios included in debt management class over time for each ranking category

Rating	Year	Formula 5 Times interest earned		Formula 6 EBITDA		Formula 19 Debt ratio		Formula 20 Debt to equity	
		Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err
1	**2014**	12.51	4.12	6758105	6648520	0.48	0.08	0.92	0.37
1	**2015**	23.62	8.84	7085814	6979718	0.49	0.08	1.00	0.38
1	**2016**	64.21	27.22	7563209	6232983	0.48	0.07	0.95	0.32
1	**2017**	53.72	55.47	8249694	7256027	0.47	0.13	0.96	0.30
2	**2014**	10.46	3.91	3664369	6307340	0.54	0.08	1.36	0.35
2	**2015**	11.16	8.38	4199516	6621542	0.52	0.08	1.30	0.36
2	**2016**	8.93	25.82	3861150	5913127	0.48	0.07	1.14	0.30
2	**2017**	12.63	52.62	4190958	6883671	0.46	0.12	1.02	0.28
3	**2014**	8.22	3.91	12300009	6013813	0.61	0.07	1.83	0.33
3	**2015**	6.86	8.38	14431851	6313393	0.64	0.08	2.04	0.35
3	**2016**	7.17	25.82	15011416	5637945	0.61	0.07	1.73	0.29
3	**2017**	8.58	52.62	17145300	6563323	0.72	0.12	1.36	0.27
4	**2014**	19.96	3.73	16567855	5757787	0.53	0.07	1.22	0.32
4	**2015**	15.30	7.99	15572848	6044613	0.62	0.07	1.33	0.33
4	**2016**	10.26	24.62	13064642	5397922	0.66	0.06	1.36	0.27
4	**2017**	7.24	50.17	13977917	6283903	0.69	0.11	1.36	0.26

Source: Own research adopted from IRESS 2014-2017

The times interest earned ratio provided for a significant improvement in the means of rating 1. This means increased from 12.51 to 23.62 to a remarkable 64.21 over three years, suggesting that companies applying an IR of 'Progress to be made' have an increasing ability to pay interest. Companies with a rating 2 indicated lower means – between 10.46 in 2014; and 12.63 in 2017. Rating-3 companies indicated the lowest means overall, between 6.86 and 8.58. Companies with the best rating had slightly better ratios but it declined annually, from 19.96 in 2014 to 7.24 in 2017. The standard error, on the other hand, did not indicate any pattern and for certain years and ratings showed scores actually higher than the mean figure. A high standard error indicates that the mean can actually be considered negligent since it points towards field noise. As the standard errors in 2016 and 2017 were found to be much higher than in the years 2014 and 2015, it is difficult to interpret the data.

When considering the earnings before interest, taxes, deprecation, and amortisation (EBITDA) ratio in particular, the rating-1 companies indicated the second-lowest means that increased slightly, over the four years, from 6 758 105 to 8 249 694. Companies with a rating 2 provided the lowest means: amongst 3 664 369 in 2014 and 4 199 516 in 2015, thus the lowest earnings available to cover interest and debt. The means of rating-3 companies were much higher than the previous two ratings, improving annually, from 12 300 009 in 2014 to 17 145 300 in 2017, which is the highest means of all ratings. Consistent with the notion that 'Excellent' ranked IR companies report higher mean scores than those that are ranked lower, rating-4 companies with high means, declined from 16 567 855 in 2014, to 13 064 642 in 2016. The mean, however, improved to 13 977 917 in 2017. The standard error overall was in line with the means.

The debt/asset ratio delivered fairly similar means over the four years for the four rankings, with a movement of only between 0.46 and 0.72. The two lowest ratings reported the lowest debt/asset ratios, which is favoured above a high ratio. The standard errors were found to be almost equal for all rankings and years.

The descriptive statistics of the debt to equity ratio also provided relatively alike means ranging between 0.92 and 2.04. The same applied to the standard error, which indicated that the means of rating 1 were the lowest, ranging between 0.92 and 1.00. The lower the ratio of long-term debt to equity, the less leveraged a company. The means of rating-3 companies increased from 2014 – 2015 to the highest overall mean of 2.04.

Table 4.5 below indicates the descriptive statistics of the four formulas included in the market ratio class.

Table 4.5 Descriptive statistics of ratios included in market ratio class over time for each ranking category

Rating	Year	Formula 8 Dividend yield		Formula 9 Earnings yield		Formula 10 Price-earnings		Formula 11 Dividend cover	
		Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err
1	**2014**	4.89	1.40	6.46	1.31	21.78	8.66	2.45	0.46
1	**2015**	4.19	1.10	6.54	0.88	24.88	9.54	2.56	0.33
1	**2016**	4.20	1.29	5.98	0.84	22.94	11.01	2.94	0.37
1	**2017**	4.07	1.19	5.39	0.98	46.59	11.16	2.82	0.45
2	**2014**	2.05	1.33	4.50	1.24	25.47	8.22	1.99	0.40
2	**2015**	2.41	1.04	5.86	0.84	33.56	9.05	2.58	0.29
2	**2016**	2.52	1.22	6.02	0.80	25.73	10.45	2.51	0.33
2	**2017**	2.44	1.12	5.99	0.93	23.79	10.59	2.48	0.40
3	**2014**	2.76	1.27	6.63	1.18	16.51	7.83	2.22	0.38
3	**2015**	2.32	0.99	5.76	0.80	19.11	8.63	2.13	0.28
3	**2016**	2.80	1.16	7.02	0.76	15.96	9.96	2.33	0.31
3	**2017**	2.83	1.07	7.07	0.89	15.91	10.10	2.50	0.38
4	**2014**	3.17	1.21	7.76	1.13	17.53	7.50	1.78	0.38
4	**2015**	3.52	0.95	6.16	0.76	18.88	8.26	1.75	0.28
4	**2016**	3.36	1.11	5.36	0.73	4.97	9.54	1.69	0.31
4	**2017**	3.35	1.03	6.15	0.85	22.12	9.67	2.07	0.38

Source: Own research adopted from IRESS 2014-2017

When considering the descriptive statistics of the dividend yield percentage ratio, the means of rating 1 can be viewed as the highest of the four ratings. The reason is that the mentioned means was above 4.00 for all four years, which implies the highest return for an investor on the investment as a dividend. Rating-2 companies, on the other hand, provided the lowest means of between 2.05 in 2014 and 2.52 in 2016. The means of rating-3 companies decreased from 2.76 in 2014 to 2.32 in 2015, but improved to 2.80 in 2016 and 2.83 in 2017. The best rating (rating 4) provided for the second-best means, ranging between 3.17 and 3.52. The standard errors for the mentioned rating are in line with the means.

The statistics for the ratio of earnings yield % do not reveal particular patterns, seeing that the means move into various directions for various rankings and years. The means of all years and rankings are between 4.5 and 7.76. Rating 2 provided the lowest mean of 4.50 in 2014, increasing to 5.86 in 2015 and to 6.02 in 2016. Companies with a rating 4 indicated the best mean of 7.76 in 2014, decreasing to 6.16 in 2015 and even lower to 5.36 in 2016. The mean nevertheless increased to 6.15 again in 2017. The standard error remained fairly equal for all means.

Contrary to what was expected, the price-earnings ratio pointed out that rating 1, the lowest EY ranking, provided the highest mean of all ratings for this ratio, 46.59 in 2017. Rating 2 had a mean of 25.47 in 2014, increasing to the second-highest mean overall for this ratio of 33.56

in 2015. The means of rating-3 companies showed no significant movements, ranging between 15.91 and 19.11. The best rating surprisingly had the lowest mean of 4.97 in 2016, indicating higher company risk. The mean was, however, as high as 17.53 in 2014, 18.88 in 2015 and grew to 22.12 in 2017. The standard error did not show any pattern and was higher than the other years regarding all rankings for 2016 and 2017. The means for 2016 and 2017 were, however, not always the highest for the four years. As the standard errors in 2016 and 2017 are much higher than in the years 2014 and 2015, it was difficult to interpret the data.

When evaluating the dividend cover formula in particular, it was found that companies with rating 1, the lowest EY ranking, provided the best two means, 2.94 in 2016 and 2.82 in 2017 respectively. A higher dividend cover indicates a greater likelihood of earning a dividend. An interesting indicator is that the best ranking, rating 4, showed the lowest mean of 1.69 in 2016. The mean, however, increased to 2.07 in 2017 and were 1.78 and 1.75 respectively in 2014 and 2015. The standard error remained between only 0.28 and 0.46.

Table 4.6 below presents the descriptive statistics of six of the seven formulas included in the profitability ratio class. Formula 17, return on invested capital (ROIC), was excluded since the data were not available on IRESS (see par. 3.5.3).

Table 4.6 Descriptive statistics of ratios included in profitability class over time for each ranking category

Rating	Year	Formula 12 Gross profit %		Formula 13 Net profit %		Formula 14 EBITDA margin		Formula 15 Net operating profit after tax		Formula 16 Return on capital employed		Formula 18 Return on equity	
		Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err	Mean	Std. Err
1	**2014**	0.17	0.04	8.85	2.36	0.15	0.03	5262383	5499189	12.82	3.60	15.75	4.61
1	**2015**	0.18	0.03	9.46	2.64	0.15	0.03	5650944	5968006	13.10	3.25	16.30	4.82
1	**2016**	0.16	0.03	9.84	2.94	0.14	0.03	5584526	5128158	12.76	15.14	15.46	22.32
1	**2017**	0.19	0.03	12.41	9.62	0.17	0.03	6329633	6017071	12.09	3.00	14.65	4.45
2	**2014**	0.10	0.03	5.87	2.24	0.08	0.03	2634369	5216988	10.35	3.41	15.89	4.38
2	**2015**	0.12	0.03	7.44	2.50	0.10	0.03	3103550	5661748	12.40	3.09	18.19	4.57
2	**2016**	0.11	0.03	10.11	2.79	0.09	0.03	2625187	4864998	39.74	14.36	58.24	21.17
2	**2017**	0.12	0.03	7.68	9.12	0.10	0.03	3059154	5708295	11.29	2.84	15.27	4.22
3	**2014**	0.20	0.03	9.03	2.14	0.16	0.03	10305704	4974203	16.78	3.25	26.89	4.17
3	**2015**	0.20	0.03	9.59	2.39	0.17	0.03	12383249	5398265	15.61	2.94	27.12	4.36
3	**2016**	0.20	0.03	9.65	2.66	0.17	0.03	12477388	4638594	16.50	13.70	27.27	20.19
3	**2017**	0.21	0.03	23.77	8.70	0.18	0.03	14128305	5442645	15.87	2.71	24.73	4.03
4	**2014**	0.27	0.03	14.27	2.05	0.24	0.03	12025570	4762437	22.07	3.12	31.93	3.99
4	**2015**	0.27	0.03	11.71	2.29	0.23	0.03	10878325	5168445	14.38	2.82	24.03	4.17
4	**2016**	0.26	0.03	8.57	2.55	0.21	0.03	7646068	4441115	11.10	13.11	20.06	19.33
4	**2017**	0.25	0.03	8.27	8.33	0.21	0.03	8284772	5210936	10.80	2.59	17.68	3.85

Source: Own research adopted from IRESS 2014-2017

The means of the gross profit % demonstrated that companies with a rating 1 had the second-lowest means ranging from 0.16 to 0.19. The means of companies with a rating 2 indicated the lowest means, between only 0.10 and 0.12. Rating-3 companies provided the second-best means, almost similar over the four years. The best EY ranking, rating 4, pointed out the highest means of 0.27 in 2014 and 2015, 0.26 in 2016 and 0.25 in 2017. This is an excellent indicator since it suggests that companies with higher EIRAs' rankings, can benefit by reporting a higher gross profit %. A standard error of only 0.03 or 0.04 were identified, which implies an insignificance spread around the means.

When evaluating the ratio of net profit % in particular, the statistics do not reveal the same patterns among variables. The rating-1 companies indicated an increase in the mean over the period: 8.85 in 2014, 9.46 in 2015, 9.84 in 2016 and 12.41 in 2017. The means of rating-2 companies increased over the first three years (5.87 in 2014 to 10.11 in 2016) with a decline in 2017 to 7.68. Rating-3 companies had a fairly consistent mean for the first three years ranging between 9.03 and 9.65. The mean improved significantly to 23.77 in 2017. The best EIRAs' ranking, rating 4, indicated the second-best mean of 14.27 in 2014, decreasing annually to reach 8.27 in 2017. Interesting to note is that the standard error figure for the year 2017 for all rankings is much higher than for the other three years. The standard errors in 2017 point towards a high spread around the means, whereas the standard errors in the other years only range between 2.05 and 2.94.

The EBITDA margin ratio reported fairly consistent figures, with means ranging between 0.08 and 0.24. The best EIRAs' ranking provided the four best means, indicating that the best ranking delivers the best EBITDA ratio. Rating 2 provided the lowest means overall. A standard error was identified of only 0.03, an extremely low spread around the means.

The net operating profit after tax (NOPAT) reported the highest ratios for the two best EIRAs' rankings and the lowest ratios for the two lowest rankings. It is demonstrated that the mean of rating-1 companies is the second-lowest of the four ratings: 5 262 383 in 2014, 5 650 944 in 2015, 5 584 526 in 2016 and 6 329 633 in 2017. The second-lowest EIRAs' ranking, rating-2 companies, had the lowest means ranging between 2 625 187 and 3 103 550. Means of rating-3 companies indicated the highest, which increased annually. The highest EIRAs' ranking, rating-4 companies, had a mean of 12 025 570 in 2014, decreasing to 10 878 325 in 2015 and 7 646 068 in 2016. It improved to 8 284 772 in 2017. The standard errors are in line with the mean figures.

The investigation of the percentages for the return on capital employed, reported figures consistent with the notion that companies with a higher EIRAs' ranking, provide higher mean scores. The means of the return on capital employed ratio, for rating-1 companies increased from 12.82 in 2014 to 13.10 in 2015, only to decrease in 2016 and 2017. Rating-2 companies indicated the highest mean of 39.74 in 2016 with the other years fairly consistent as the means ranged between 10.35 and 12.40. The means of rating-3 companies remained fairly similar, ranging between 15.61 and 16.78. The best EIRAs' ranking provided the second-highest mean score of 22.07 in 2014, only to decline to 14.38 in 2015, 11.10 in 2016 and 10.80 in 2017. The standard error in 2016 for all rankings was high in relation to the other years, which indicates widespread data around the means. Since the means were not always higher in 2016, this makes it difficult to interpret the data.

The percentage ratio for return on equity reported similar descriptive statistics than the percentage for return on capital employed. In this regard, rating-2 companies also indicated a significant upwards curve from 2015 to 2016. This ratio demonstrated that companies with a rating 1 had mostly a stable mean, amongst 14.65 and 16.30. Ranking 2 provided an increase in means, from 15.89 in 2014, 18.19 in 2015 to an impressive 58.24 in 2016 and 15.27 in 2017. Companies with a rating 3 also showed a mostly stable mean, which is similar to ranking 1. However, the means of ranking 3 was found to be higher than that of ranking 1, ranging between 24.73 and 27.27. The mean score of ranking-4 companies declined annually, from 31.93 in 2014 to 17.68 in 2017. The same standard error pattern was identified as in the percentage for return on capital employed. The standard error in 2016 for all rankings was high in comparison to the other years, which indicates that the mean is negligent. As the means were not always higher in 2016, this makes it difficult to interpret the data.

Table 4.7 below explicates the descriptive statistics of the final investigated formula – the market capitalisation figure.

Table 4.7 Descriptive statistics of market capitalisation over time for each ranking category

Rating	Year	Formula 21 Market capitalisation	
		Mean	Std. Err
1	**2014**	141 622 617 429	78 927 014 994
1	**2015**	178 919 341 174	105 043 529 777
1	**2016**	163 515 390 384	94 181 774 309
1	**2017**	247 713 003 474	130 566 549 327
2	**2014**	52 547 576 764	74 876 740 890
2	**2015**	50 315 661 882	99 653 042 268
2	**2016**	50 216 741 200	89 348 676 268
2	**2017**	58 446 109 042	123 866 304 631
3	**2014**	147 081 749 501	71 392 171 243
3	**2015**	193 313 461 207	95 015 447 707
3	**2016**	178 730 894 247	85 190 620 220
3	**2017**	227 070 657 349	118 101 887 533
4	**2014**	113 656 634 684	68 352 800 030
4	**2015**	100 853 077 898	90 970 365 290
4	**2016**	95 320 546 640	81 563 809 125
4	**2017**	98 833 327 818	113 073 948 602

Source: Own research adopted from IRESS 2014-2017

The yearly statistics of Table 4.7 above do not disclose specific patterns between dependent variables. The level of alignment of rating-1 and -3 companies are fairly similar, whereas the strongest rating only provided the second-lowest market capitalisation figures and the 'average' ranked IRs reported the lowest means. From Table 4.7 above it shows that rating-1

companies had a mean of 141 622 617 429 in 2014, which increased to 178 919 341 174 in 2015. The year 2016 showed a slight decrease from 2015, to 163 515 390 384, but there was a significant improvement in 2017 to reach the highest mean of all ratings of 247 713 003 474. The means of rating-2 companies showed the lowest scores, moving only between 50 216 741 200 and 58 446 109 042. Rating-3 companies demonstrated the second-highest means, which increased from 147 081 749 501 in 2014, to 193 313 461 207 in 2015. There was a slight decline to 178 730 894 247 in 2016, with an improvement to 227 070 657 349 in 2017. The best EIRAs' ranking, rating 4, provided the second-lowest means, decreasing from 113 656 634 684 in 2014, to 95 320 546 640 in 2016. There was a slight increase to 98 833 327 818 in 2017. When evaluating the standard error, it seems that the market capitalisation figure for all the 2017 years is much higher than the other three years. Rating 4 is the only ranking where the mean was not the highest in 2017, therefore it can be said that the standard error is in line with the means, except for the best ranking.

As can be seen from the discussion above, almost each ratio delivered a different movement in mean score over the four-year period. The following paragraph continues with the data analysis by applying Spearman's rank-order correlation technique.

4.4 SPEARMAN RANK-ORDER CORRELATION TECHNIQUE

The Spearman rank-order correlation technique was applied to analyse how strongly the ratios are related to EIRAs' rankings of companies. In this paragraph the correlation of the variables is provided and examined. The correlation indicates the strength of the relationship amongst variables. As explained in par. 3.5.4.2, Spearman's correlation coefficients were calculated to study how strongly the four years' ratios within the three financial indicator categories (financial performance, risk and growth) are related to the different rankings of the EIRAs for companies. Financial ratios were compared to determine the relationship between the two variables, which is the IRG ranking and the financial indicators. Thereafter, the significance of the correlation was investigated.

The 'Rating' column in Tables 4.8 to 4.12 below indicates the correlation between EIRAs' ranking with the ratio per year. At first, only statistically significant correlations ($p<0.05$) were to be discussed. However, Field (2009:51) points out that the 95% criterion, or a 0.05 probability, is part of the basis of modern statistics with no real justification. Since the investigation indicated a few statistically significant correlations with $p<0.05$, those statistically significant on a 10% level (where $p<0.10$) were also elaborated on. Statistical significance at the 10% and 5% levels, are indicated by * and ** respectively, based on a two-tailed test.

The correlation coefficient that is being measured should be understood as indicated by Tables 4.8 to 4.12: the higher the figure in the 'Rating' column, the higher the correlation

between the EY ranking and the financial indicator. These tables outline Spearman's correlations for the variables used in the sample period from 2014 – 2017. Table 4.8 below provides the correlation coefficient of the four formulas included in the ratio class of asset management (see Table 2.5).

Table 4.8 Spearman's rank-order correlation of ratios in asset management class

Spearman's rank-order correlations				
Year	Formula 1 Inventory turnover	Formula 2 Average debtors collection period	Formula 3 Fixed-asset turnover	Formula 4 Total asset turnover
	Rating	Rating	Rating	Rating
2014	-0.18	0.04	-0.09	-0.04
2015	-0.05	0.05	-0.16	-0.12
2016	-0.09	0.12	-0.22	-0.18
2017	-0.13	0.14	-0.18	-0.16

None of the ratios in the table above provided a significant correlation.

Table 4.9 Spearman's rank-order correlation of ratios in debt management class

Spearman's rank-order correlations				
Year	Formula 5 Times interest earned	Formula 6 EBITDA	Formula 19 Debt ratio	Formula 20 Debt to equity
	Rating	Rating	Rating	Rating
2014	0.25	0.34**	0.05	0.09
2015	0.13	0.24	0.14	0.15
2016	0.02	0.23	0.21	0.22
2017	-0.07	0.20	0.20	0.17

**p<0.05

The EBITDA ratio, formula 6, demonstrated a statistically significant and positively associated correlation of 0.34 (medium effect) for the year 2014. In other words, in 2014, there was a statistically meaningful correlation between the EBITDA ratio and the EIRAs' rankings.

Table 4.10 Spearman's rank-order correlation of ratios in market ratio class

Spearman's rank-order correlations				
Year	Formula 8 Dividend yield	Formula 9 Earnings yield	Formula 10 Price-earnings	Formula 11 Dividend cover
	Rating	Rating	Rating	Rating
2014	0.24	0.06	-0.01	-0.28*
2015	0.18	-0.08	0.13	-0.31*
2016	0.35**	-0.10	0.00	-0.31**
2017	0.24	0.15	-0.15	-0.12

**p<0.05

*p<0.10

From Table 4.10 above, several correlations are noteworthy. For the dividend yield ratio, formula 8, a significant correlation is identified. This indicates a positive correlation with a medium effect (0.35) in 2016. A positive correlation specifies that if the ranking increases, the financial indicator increases as well. On the other hand, a medium significant negative association of -0.31 could be found for the dividend cover, formula 11, in 2016. A negative correlation indicates that the higher the EIRAs' ranking, the lower the financial indicator. For the years 2014 and 2015, a negative medium statistically meaningful correlation for $p<0.10$ was also documented for the dividend cover.

Table 4.11 below presents the results of the correlation coefficient for six of the seven formulas included in the profitability ratio class. Formula 17, return on invested capital, was excluded since the data were unavailable on IRESS.

Table 4.11 Spearman's rank-order correlation of ratios in profitability class

Spearman's rank-order correlations						
Year	**Formula 12** **Gross profit %**	**Formula 13** **Net profit %**	**Formula 14** **EBITDA margin**	**Formula 15** **Net operating profit after tax**	**Formula 16** **Return on capital employed**	**Formula 18** **Return on equity**
	Rating	**Rating**	**Rating**	**Rating**	**Rating**	**Rating**
2014	0.41**	0.33**	0.35**	0.40**	0.37**	0.51**
2015	0.34**	0.20	0.30**	0.24	0.12	0.29*
2016	0.39**	0.11	0.31**	0.23	-0.01	0.19
2017	0.28*	0.07	0.24	0.16	-0.03	0.07

**p<0.05

*p<0.10

The profitability class provided several significant associations. The variable, the gross profit % (formula 12), indicated medium to strong positive and significant coefficients of 0.41 in 2014, 0.34 in 2015 and 0.39 in 2016 when $p<0.05$, which suggests in economical terms that greater EIRAs' rankings have a higher gross profit %. Considering $p<0.10$, the association of this ratio in 2017 of 0.28, is also significant.

Regarding the control variable, formula 13, the net profit %, has provided a positive and medium significant coefficient of 0.33 in 2014. This score indicates that increases in the EIRAs' ranking are associated with increases in net profit %.

Consistent with the previous two ratios, a positive and medium significant relation were found between EIRAs' rankings and the EBITDA margin ratio, formula 14 (0.35 in 2014, 0.30 in 2015 and 0.31 in 2016). Thus, the results suggest that improved IRG can affect the ratio of a company's EBITDA margin.

In formula 15, the interaction between the different rankings of the EIRAs grading the IRs of companies and the ratios for net operating profit after tax were established to be largely positive and significant at the 5% level, as indicated by a figure of 0.40 in 2014.

The result suggests that better quality disclosures of IRs improves formula 16, the return on capital employed in 2014. This was indicated with a correlation of 0.37, which is statistically significant with a medium effect.

The main effect of the relation of the return on equity ratio, formula 18, was found to be positive (0.51 in 2014) and substantially significant at the 5% level. The correlation in 2015 was also statistically significant when p<0.10, with a medium effect.

Table 4.12 Spearman's rank-order correlation of market capitalisation

Spearman's rank-order correlations	
Year	**Formula 21** **Market capitalisation**
	Rating
2014	0.31**
2015	0.31**
2016	0.19
2017	0.12

**p<0.05

Table 4.12 above shows that IRG quality have a positive effect on a company's market capitalisation since the scores are significantly positive, showing a meaningful medium economical impact of 0.31 in 2014 and 2015.

Overall, supporting evidence indicate that none of these measures produced consistently significant results. Therefore, at best, the results provide only medium support for the notion that IRG quality increases a company's financial indicators. The Spearman rank-order correlation was analysed annually. The repeated measures ANOVA, the third statistical technique, which analyses correlations over a period of time, is discussed subsequently.

4.5 REPEATED MEASURES ANOVA

To analyse the relationship between the financial indicators for different EIRAs' rankings of companies over the period 2014 – 2017, the repeated measures ANOVA was done. The bivariate analysis applies in this case, where the two variables are the IRG ranking of the sampled companies and the financial indicators.

The following information as presented in Table 4.13 below should be noted.

Table 4.13 Repeated measures ANOVA tables ordering

As per table	EIRAs' ranking
Rating 1	Progress to be made
Rating 2	Average
Rating 3	Good
Rating 4	Excellent
As per table	**Year**
J1	2014
J2	2015
J3	2016

The results for the repeated measures ANOVA are provided in Tables 4.14 to 4.32 below. In these tables the relevant rows are presented. The 'Intercept' row tested the hypothesis that the average of ratios is zero and is therefore rejected for all ratios. This hypothesis will not be discussed further in the successive tables below. The sum of squares ('SS') gives an estimation of the total variability of a data set (Field, 2009:795). Degrees of freedom ('DF') point to the amount of observations that are allowed to fluctuate (Field, 2009:37) and is one less than the number of groups. Mean squares ('MS') is a "measure of average variability" (Field, 2009:789). The formula for MS is SS divided by DF (Field, 2009:203; Tabachnick & Fidell, 2014). Test statistics ('F') entail the mean squares of the model (MSm) divided by the mean squares of the residual (MSr) (Field, 2009:795). The p-value ('P') is calculated from the F-distribution with DF of the model and the residuals. The p-value indicates whether the effect is statistically significant.

The row 'Time*Rating' specifies whether the average of ratios of the various companies changes over time for different EIRAs' ratings, therefore this is the row applicable to the present study. As indicated in par. 4.4, only a p-value of below 0.05 and below 0.10 will be discussed since such a value indicates a statistically meaningful effect. The p-value in the 'Rating' row indicates significant differences between the average of EIRAs' ratings of the various companies, over all the years combined. The p-value in the 'Time' row points towards a difference over time in the average of the formula, where all ratings are combined. Only statistically meaningful p-values in the 'Time*Rating' rows are explained, seeing that the interaction between the two terms should be examined, not each terms on its own.

In the tables to follow, the repeated measures ANOVA of the formulas are provided. It was first determined whether an interaction affect was significant. If significant, the mean scores as illustrated in a graph were provided to be interpreted. Thus, if the interaction effect is not significant, a graph has no use and was not provided.

Table 4.14 Repeated measures ANOVA of inventory turnover ratio for different rankings over time

Repeated measures analysis of variance					
Formula 1 Inventory turnover					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	5 671.30	1	5671.30	41.82	-
Rating	243.42	3	81.14	0.60	0.620
Error	5 153.87	38	135.63		
Time	10.28	3	3.43	0.62	0.602
Time*Rating	44.26	9	4.92	0.89	0.534
Error	628.05	114	5.51		

The repeated measures ANOVA for inventory turnover is displayed in Table 4.14 above. The p-value in the 'Time*rating' row was found to be not less than 5% or 10%. Thus, there is no indication of a significant interaction effect between the average inventory turnover ratio of 2014 – 2017 and EIRAs' rankings of companies.

Table 4.15 Repeated measures ANOVA of average debtors collection period for different rankings over time

Repeated measures analysis of variance					
Formula 2 Average debtors collection period					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	705 778.50	1	705778.50	120.17	-
Rating	15 354.80	3	5118.27	0.87	0.464
Error	223 178.50	38	5873.12		
Time	795.60	3	265.20	1.13	0.342
Time*Rating	823.20	9	91.47	0.39	0.939
Error	26 868.30	114	235.69		

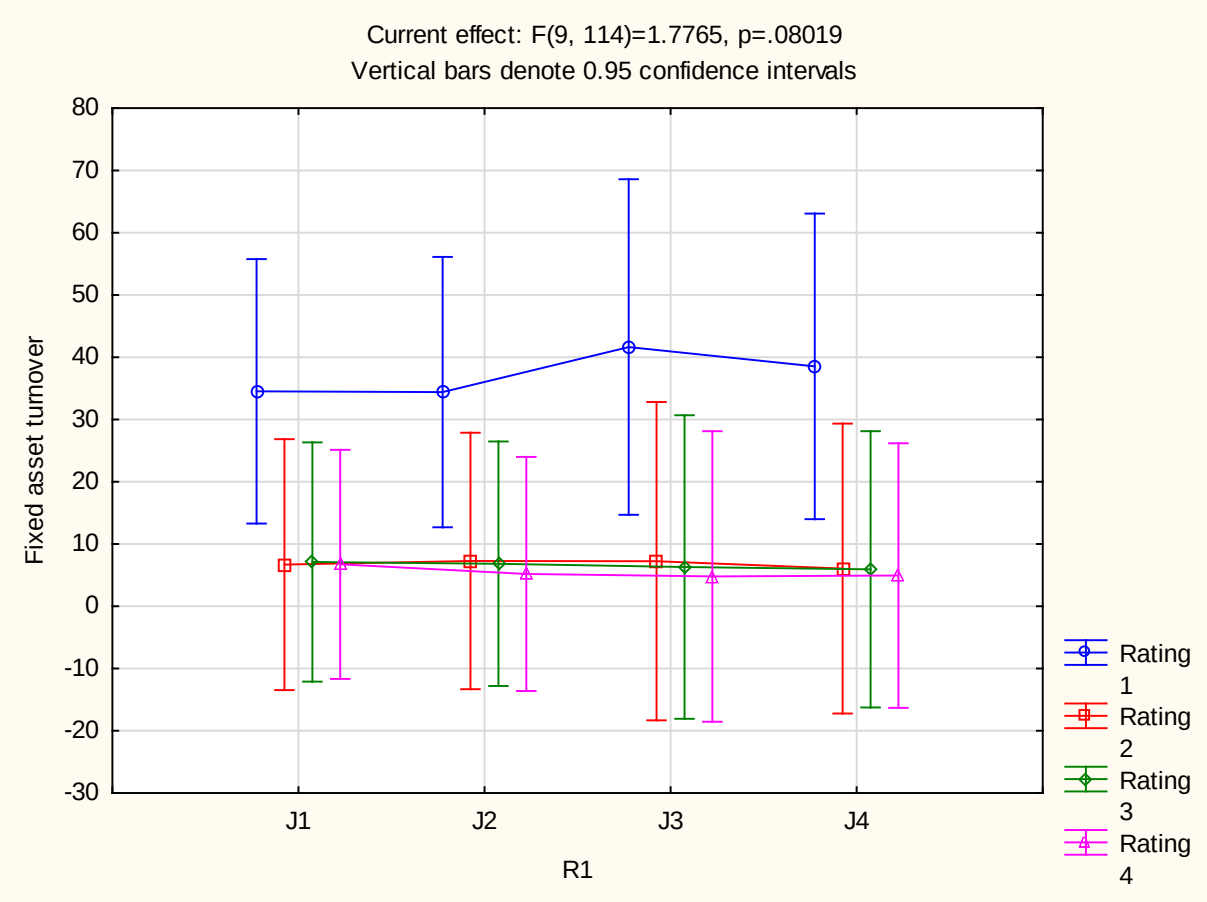
Table 4.15 illustrates no statistically significant relationship between the average debtors collection period of 2014 – 2017 and EIRAs' rankings of companies. Thus, the outcome was not significant.

Table 4.16 Repeated measures ANOVA of fixed-asset turnover for different rankings over time

Repeated measures analysis of variance					
Formula 3 Fixed-asset turnover					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	32 605.95	1	32605.95	6.68	0.014
Rating	27 333.66	3	9111.22	1.87	0.152
Error	185 421.49	38	4879.51		
Time	57.65	3	19.22	0.91	0.437
Time*Rating	336.77	9	37.42	1.78	0.080*
Error	2 401.14	114	21.06		

*p<0.10

Figure 4.1 Repeated measures ANOVA of fixed-asset turnover for different rankings over time



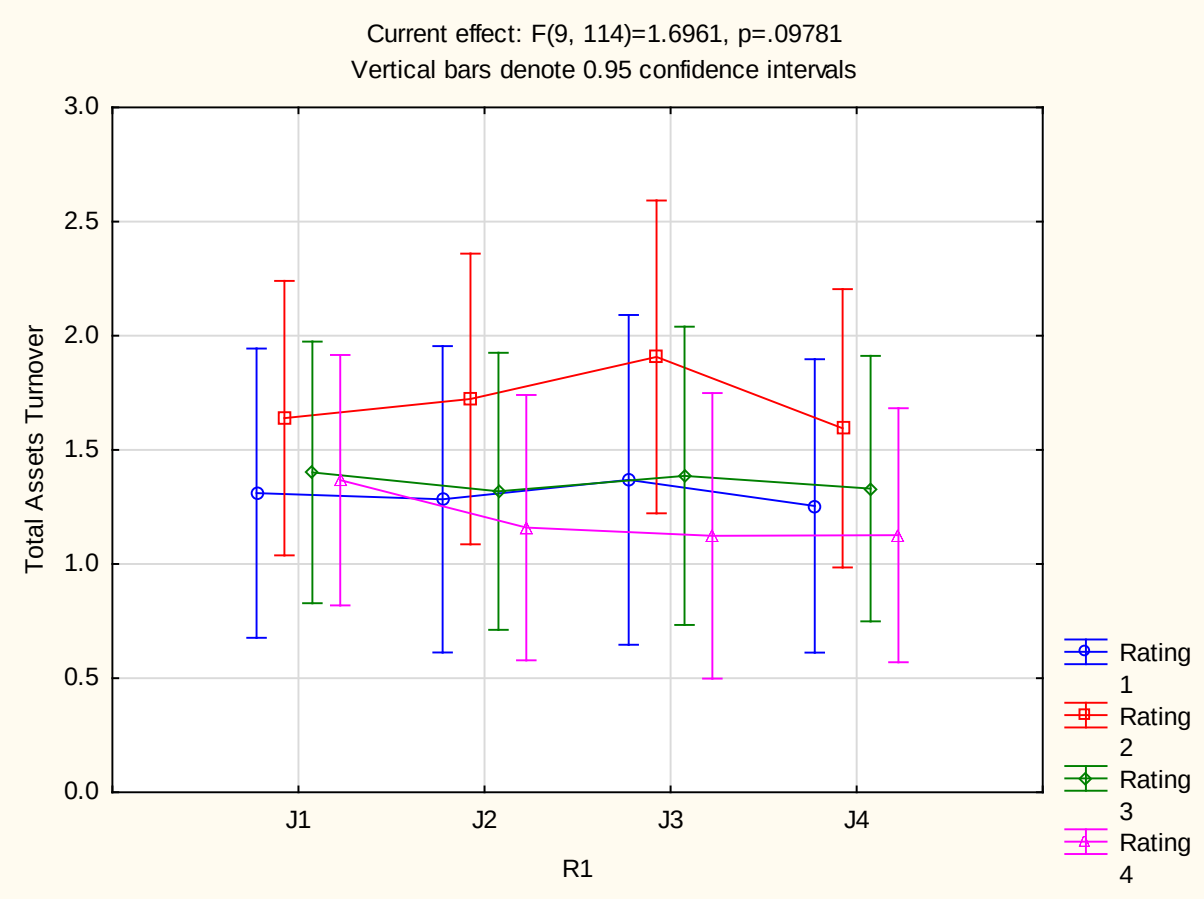
In Table 4.16 above, the significant p-value indicates a difference when the fixed-asset turnover means were compared regarding an interaction between time (which year) and rating (1, 2, 3, and 4). The p-value does not indicate where the difference(s) lay. To determine these differences, Figure 4.1 were evaluated to interpret each grouping separately. Figure 4.1 above depicts the means of companies with rating 2, 3 and 4 as fairly similar (ranging between only 4.79 and 7.28). The significant difference was identified with rating-1 companies, which provided the rating with the highest fixed-asset turnover for all years. The graph identifies 34 as the figure in both 2014 (J1) and 2015 (J2), which is much higher than the figures of the companies with the other ratings. This figure soared to an impressive 41.63 in 2016, with a slight decrease to 38.53 in 2017.

Table 4.17 Repeated measures ANOVA of total asset turnover for different rankings over time

Repeated measures analysis of variance					
Formula 4 Total asset turnover					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	322.49	1	322.49	85.66	-
Rating	6.39	3	2.13	0.57	0.641
Error	143.06	38	3.76		
Time	0.38	3	0.13	2.39	0.072
Time*Rating	0.80	9	0.09	1.70	0.098*
Error	6.00	114	0.05		

*p<0.10

Figure 4.2 Repeated measures ANOVA of total asset turnover for different rankings over time



According to Table 4.17 above, the significant p-value of 0.098 in 'Time*Rating' points towards a significant difference when the means for total asset turnover were compared to determine the extent of interaction between time and rating. Figure 4.2 above illustrates that the means of the total asset turnover ratio only moved between 1.12 and 1.91. Rating 2 is indicated as

the rating with the highest total asset turnover. Rating-2 and -4 companies provided significant movements. The means of rating-2 companies increased from 2014 – 2016 with a noteworthy decline in 2017. Rating-4 companies, on the other hand, indicate a substantial decrease from 2014 – 2016. The differences for rating-3 and -4 companies are, however, not of economic significance.

Table 4.18 Repeated measures ANOVA of times interest earned for different rankings over time

Repeated measures analysis of variance					
Formula 5 Times interest earned					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	76 541.21	1	76 541.21	3.99	0.053
Rating	58 049.75	3	19 349.92	1.01	0.400
Error	689 751.82	36	19 159.77		
Time	16 032.40	3	5 344.13	1.00	0.396
Time*Rating	56 960.19	9	6 328.91	1.18	0.313
Error	577 859.27	108	5 350.55		

No statistically significant differences in the 'Time*Rating' row were identified for the times interest earned ratio.

Table 4.19 Repeated measures ANOVA of EBITDA for different rankings over time

Repeated measures analysis of variance					
Formula 6 EBITDA					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	17.37	1	17.37	10.80	0.002
Rating	37.12	3	12.37	0.77	0.519
Error	61.14	38	16.09		
Time	30.62	3	10.21	0.60	0.615
Time*Rating	20.37	9	22.63	1.33	0.227
Error	19.33	114	16.96		

No statistically significant differences were identified. Formula 7, the coverage of fixed charge coverage ratio is excluded since data were unavailable on IRESS.

Table 4.20 Repeated measures ANOVA of dividend yield for different rankings over time

Repeated measures analysis of variance					
Formula 8 Dividend yield					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	1 680.16	1	1 680.16	31.39	0.000
Rating	87.68	3	29.23	0.55	0.654
Error	2 034.29	38	53.53		
Time	0.33	3	0.11	0.13	0.942
Time*Rating	7.42	9	0.82	0.98	0.461
Error	95.98	114	0.84		

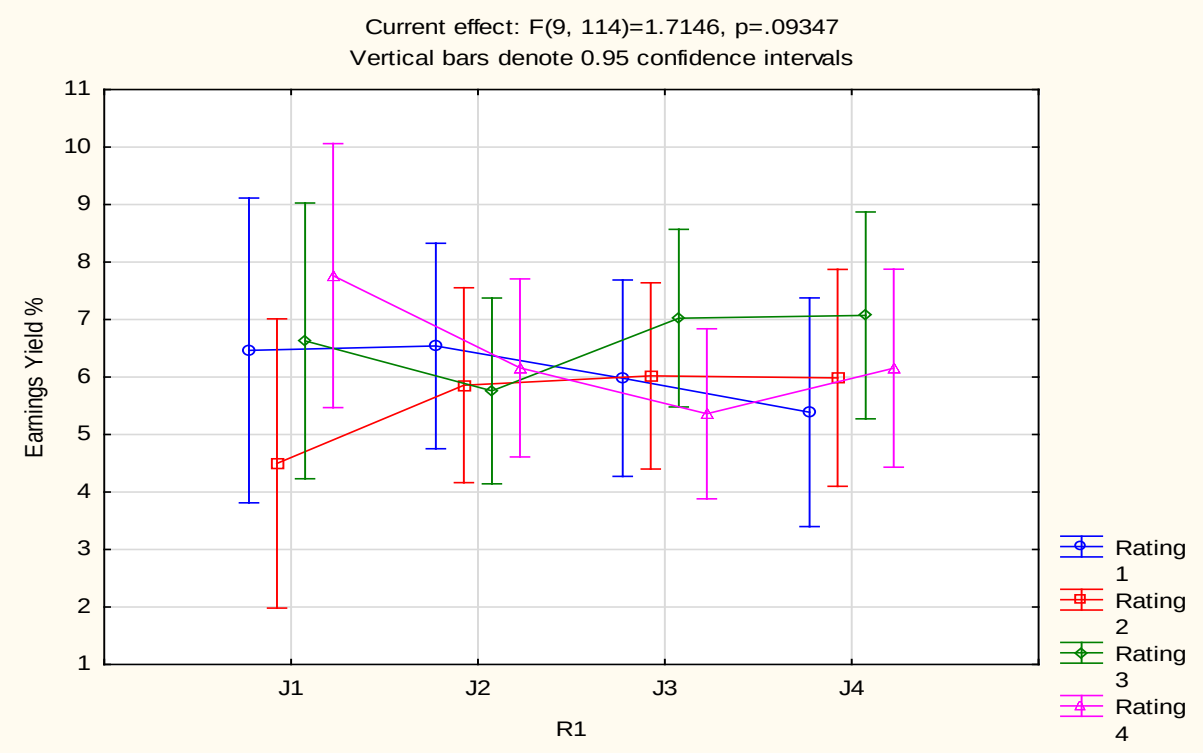
No significant p-values were identified for the dividend yield ratio.

Table 4.21 Repeated measures ANOVA of earnings yield for different rankings over time

Repeated measures analysis of variance					
Formula 9 Earnings yield					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	6 313.63	1	6 313.63	262.55	-
Rating	24.27	3	8.09	0.34	0.799
Error	913.79	38	24.05		
Time	1.76	3	0.59	0.13	0.942
Time*Rating	69.36	9	7.71	1.71	0.093*
Error	512.45	114	4.50		

*p<0.10

Figure 4.3 Repeated measures ANOVA of earnings yield for different rankings over time



In Table 4.21 above, the p-value of the 'Time*Rating' column shows an effect below 0.10 of 0.093. This indicates that the average of the earnings yield by the various companies significantly changes over time for different EIRAs' ratings. It seems as if the various ratings in Figure 4.3 reacted differently over the years. The means of rating-4 companies demonstrated a notable decline of -1.6 from 2014 – 2015, with a further decline in 2016 and an increase to 6.15 in 2017. This is in contrast to rating-2 companies that indicated improvement in means from 2014 – 2016 of 1.52. The means of rating-1 companies decreased from 2015 to 2017 with 1.15, while the figures of rating-3 companies increased from 2015 to 2017 with 1.31.

Table 4.22 Repeated measures ANOVA of price-earnings for different rankings over time

Repeated measures analysis of variance					
Formula 10 Price-earnings					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	82 106.24	1	82 106.24	38.88	-
Rating	5 778.49	3	1 926.16	0.91	0.444
Error	80 246.47	38	2 111.75		
Time	2 252.89	3	750.96	1.41	0.243
Time*Rating	4 238.45	9	470.94	0.89	0.540
Error	60 597.18	114	531.55		

No significant p-values were acknowledged for the average of the price-earnings ratio.

Table 4.23 Repeated measures ANOVA of dividend cover for different rankings over time

Repeated measures analysis of variance					
Formula 10 Dividend cover					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	746.98	1	746.98	255.84	-
Rating	13.57	3	4.52	1.55	0.221
Error	93.43	32	2.92		
Time	2.50	3	0.83	1.46	0.230
Time*Rating	2.27	9	0.25	0.44	0.908
Error	54.77	96	0.57		

Table 4.23 above shows that for the average of the dividend cover ratio, only p-values above 0.10 or 0.05 were recognised. As a result, no statistically significant differences were identified.

Table 4.24 Repeated measures ANOVA of gross profit % for different rankings over time

Repeated Measures Analysis of Variance					
Formula 12 Gross profit %					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	5.82	1	5.82	154.15	-
Rating	0.51	3	0.17	4.53	0.008
Error	1.43	38	0.04		
Time	0.00	3	0.00	1.13	0.339
Time*Rating	0.01	9	0.00	1.17	0.321
Error	0.11	114	0.00		

**p<0.05

In the table above, no significant p-values were acknowledged for the average of the ratio of gross profit %.

Table 4.25 Repeated measures ANOVA of net profit % for different rankings over time

Repeated measures analysis of variance					
Formula 13 Net profit %					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	17 988.18	1	17 988.18	34.63	-
Rating	581.16	3	193.72	0.37	0.773
Error	19 737.09	38	519.40		
Time	381.24	3	127.08	0.76	0.520
Time*Rating	1 773.04	9	197.00	1.17	0.319
Error	19 134.74	114	167.85		

Regarding the net profit margin ratio, only p-values higher than 0.10 or 0.05 were documented.

Table 4.26 Repeated measures ANOVA of EBITDA margin for different rankings over time

Repeated measures analysis of variance					
Formula 14 EBITDA margin					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	4.21	1	4.21	120.40	-
Rating	0.39	3	0.13	3.68	0.020
Error	1.33	38	0.03		
Time	0.00	3	0.00	0.70	0.556
Time*Rating	0.01	9	0.00	1.50	0.155
Error	0.12	114	0.00		

**p<0.05

No statistically significant differences were identified.

Table 4.27 Repeated measures ANOVA of net operating profit after tax for different rankings over time

Repeated measures analysis of variance					
Formula 15 Net operating profit after tax					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	97.16	1	97.16	8.79	0.005
Rating	22.09	3	73.64	0.67	0.578
Error	42.01	38	11.06		
Time	22.65	3	75.49	0.46	0.714
Time*Rating	21.87	9	24.30	1.47	0.168
Error	18.87	114	1.66		

When evaluating the net operating profit after tax ratio, no p-values below 0.10 or 0.05 were registered. As a result, no statistically significant differences were identified.

Table 4.28 Repeated measures ANOVA of return on capital employed for different rankings over time

Repeated measures analysis of variance					
Formula 16 Return on capital employed					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	39 786.24	1	39 786.24	46.97	-
Rating	691.83	3	230.61	0.27	0.845
Error	32 186.95	38	847.03		
Time	1 330.55	3	443.52	0.88	0.453
Time*Rating	5 857.55	9	650.84	1.29	0.248
Error	57 329.20	114	502.89		

No statistically significant differences were identified for the average of the ratio for return on capital employed. Regarding formula 17, the return on invested capital, no data were available on IRESS, therefore the ratio is ignored.

Table 4.29 Repeated measures ANOVA of return on equity for different rankings over time

Repeated measures analysis of variance					
Formula 18 Return on equity					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	88 555.55	1	88 555.55	50.10	-
Rating	3 136.34	3	1 045.45	0.59	0.624
Error	67 169.01	38	1 767.61		
Time	3 299.17	3	1 099.72	1.00	0.395
Time*Rating	11 549.82	9	1 283.31	1.17	0.322
Error	125 167.53	114	1 097.96		

Only statistically weak differences were identified for the average of the ratio of return on capital employed.

Table 4.30 Repeated measures ANOVA of debt ratio for different rankings over time

Repeated measures analysis of variance					
Formula 19 Debt ratio					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	52.64	1	52.64	197.06	-
Rating	0.87	3	0.29	1.09	0.366
Error	10.15	38	0.27		
Time	0.05	3	0.02	0.88	0.451
Time*Rating	0.23	9	0.03	1.31	0.238
Error	2.24	114	0.02		

The significance level of the average debt ratio is registered as higher than 0.10.

Table 4.31 Repeated measures ANOVA of debt to equity for different rankings over time

Repeated measures analysis of variance					
Formula 20 Debt to equity					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	282.82	1	282.82	73.66	-
Rating	12.94	3	4.31	1.12	0.352
Error	145.91	38	3.84		
Time	1.29	3	0.43	3.51	0.018
Time*Rating	2.23	9	0.25	2.02	0.044**
Error	14.02	114	0.12		

**p<0.05

Figure 4.4 Repeated measures ANOVA of debt to equity for different rankings over time

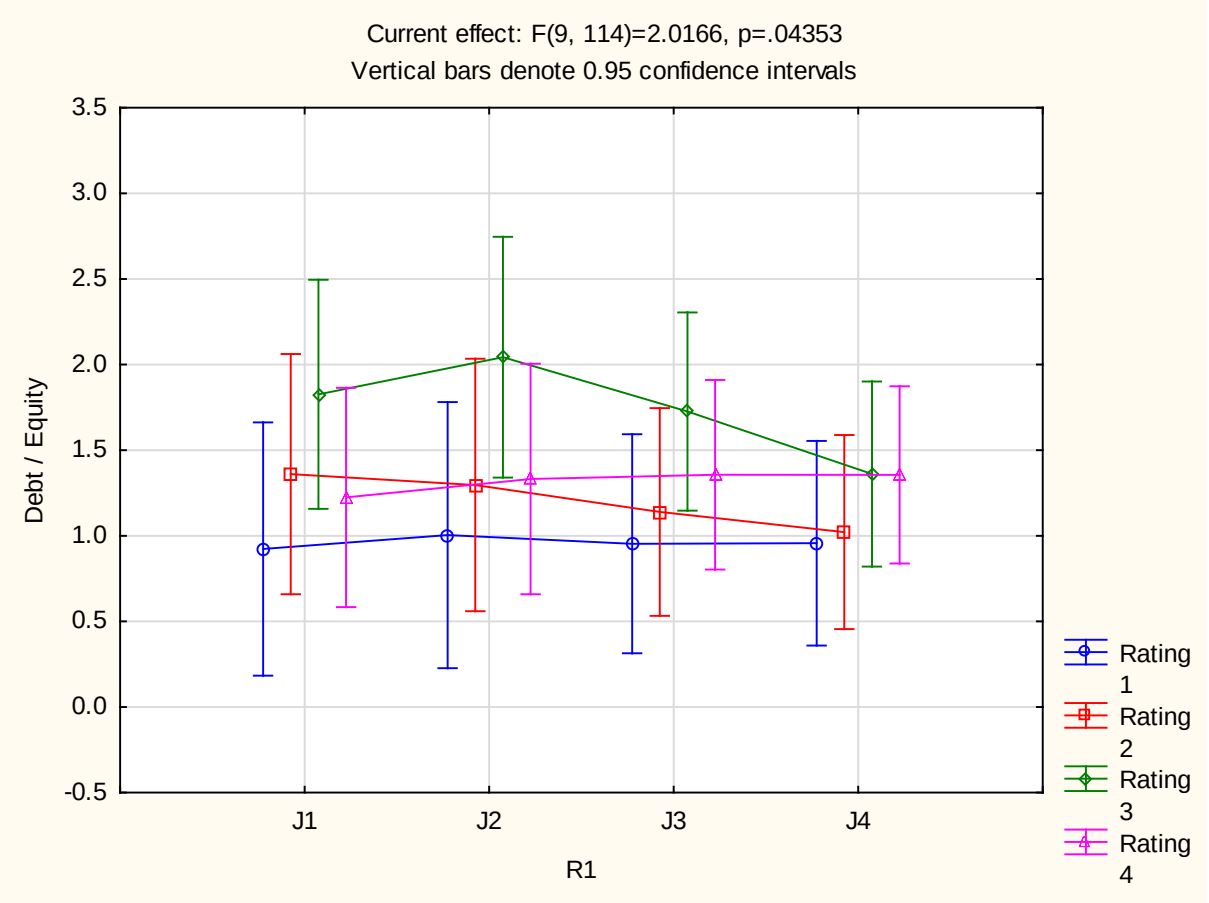


Table 4.31 above, indicates a p-value of the 'Time*Rating' column with an effect below 0.05 of 0.044. This specifies that the average of the debt to equity ratio of the various companies changed significantly over time for different EIRAs' ratings. The means of this ratio falls within 0.92 and 2.04. Surprisingly, rating 3 and 4, the two best ratings, provided the highest average debt to equity figures, which are not preferable. Furthermore, rating 1 also had the lowest average debt to equity ratio, indicating that these companies' debt gearing was low. The movement in means of rating-1 and -4 companies are not noteworthy. However, the means of rating-3 companies provided an increase of 0.21 from 2014 – 2015, with a decrease of 0.68 from 2015 – 2017. Rating-2 companies declined annually overall with 0.34.

Table 4.32 Repeated measures ANOVA of market capitalisation for different rankings over time

Repeated measures analysis of variance					
Formula 21 Market capitalisation					
Effect	**SS**	**DF**	**MS**	**F**	**P**
Intercept	28.56	1	28.56	7.70	0.009
Rating	51.67	3	17.22	0.46	0.709
Error	14.10	38	37.11		
Time	46.09	3	15.36	2.62	0.054
Time*Rating	55.83	9	62.03	1.06	0.398
Error	66.73	114	58.54		

*p<0.10

In the table above, only weak statistically differences were identified for the average of the market capitalisation figure.

It was established that the following ratios provided significant differences when their means were compared to determine interaction between time (which year) and rating (1, 2, 3, and 4); fixed-asset turnover, total asset turnover, earnings yield and debt to equity ratio.

4.6 INTERPRETATION OF FINAL RESULTS

After conducting the research, the acquired results must be interpreted (Mouton, 2001; Welman *et al.*, 2005:241). The results can be interpreted and conclusions drawn with the help of descriptive and inferential statistics (Welman *et al.*, 2005:241). The research findings were attained by applying the statistical methods explained comprehensively in par. 4.3 to 4.5. Data gathered over four years were demonstrated, summarised and explicated. The findings for the statistical methods are summarised in par. 4.6.1.

4.6.1 Synopsis of findings for statistical methods

Descriptive statistics

The descriptive statistics provided the means and standard errors of all ratios for the various ratings over the four year period. Only ratios with a similar standard error in relation to its means could be explained, seeing that an interpretation of ratios with a widespread standard error would not add value to the study.

A synopsis was therefore made of noteworthy observations, namely ratios that displayed a similar standard error in relation to its means. The synopsis is provided in Table 4.33 below. The results in the last column is the researcher's interpretation of the noteworthy observations as summarised in the rest of the table.

Table 4.33 Synopsis of statistical findings – descriptive statistics

Financial indicator	Ratio class	Financial indicator category	Noteworthy observations	Results
The standard error for all years and ratings for the ratios below were fairly similar, making the interprepation of the means more meaningful.				
Inventory turnover	Asset management	Financial performance/growth	Rating 2 (Average) provided the highest inventory turnover. Rating 3 (Good) had, on average, a much lower inventory turnover ratio than the other ratings.	Inventory ratio weakened as IRG quality increased.
Average debtors collection period	Asset management	Financial performance/growth	Rating 2 displayed the shortest debt collection period. Rating 4 (Excellent) displayed the the longest debt collection period.	Average debtors collection period ratio weakened as IRG quality increased.
EBITDA	Debt management	Financial performance/risk	Rating 1 (Progress to be made) indicated the second-lowest means that slightly increased over the four years. Rating 2 provided lowest means. Rating-3 companies were much higher than the previous two ratings. Rating-4 companies came up with high means.	EBITDA ratio improved as IRG quality increased.
Dividend yield	Market ratios	Financial performance/growth	Rating 1 can be viewed as the highest of the four ratings. Rating 2 provided the lowest means. Rating 4 provided for the second-best means.	Results were inconsistent and no conclusion can be drawn about the relationship of the dividend yield ratio and the quality of IRG.
Earnings yield	Market ratios	Financial performance/growth	Rating 2 provided the lowest mean in 2014. Rating 4 indicated the best mean of in 2014.	Earnings yield ratio improved as IRG quality increased.

Table 4.33 Synopsis of statistical findings – descriptive statistics (continues)

Financial indicator	Ratio class	Financial indicator category	Noteworthy observations	Results
Dividend cover	Market ratios	Financial performance/growth	Rating 1 provided the best two means, in 2016 and 2017 respectively. Rating 4, showed the lowest mean in 2016.	The dividend cover formula weakened as IRG quality increased.
Gross profit %	Profitability	Financial performance	Rating 1 had the second-lowest means. Rating 2 indicated the lowest means. Rating-3 companies provided the second-best means. Rating 4 pointed out the highest means.	Gross profit % improved as IRG quality increased.
NOPAT	Profitability	Financial performance	Highest ratios for the two best EIRAs' rankings (rating 3 and 4) and the lowest ratios for the two lowest EIRAs' rankings (rating 1 and 2).	NOPAT ratio improved as IRG quality increased.

Source: Own research

The Spearman rank-order correlation technique

Spearman's rank-order correlation technique analysed how strongly the ratios are related between EIRAs' rankings of companies. The following significant findings were registered as presented in Table 4.34.

Table 4.34 Synopsis of statistical findings – Spearman's rank-order correlation technique

Financial indicator	Ratio class	Financial indicator category	Significance	Year	P-value
EBITDA	Debt management	Financial performance/risk	p<0.05	2014	0.34
Dividend yield	Market ratios	Financial performance/ growth	p<0.05	2016	0.35
Dividend cover	Market ratios	Financial performance/ growth	p<0.10 p<0.10 p<0.05	2014 2015 2016	-0.28 -0.31 -0.31
Gross profit %	Profitability	Financial performance	p<0.05 p<0.05 p<0.05 p<0.10	2014 2015 2016 2017	0.41 0.34 0.39 0.28
Net profit %	Profitability	Financial performance	p<0.05	2014	0.33
EBITDA margin	Profitability	Financial performance	p<0.05 p<0.05 p<0.05	2014 2015 2016	0.35 0.30 0.31
NOPAT	Profitability	Financial performance	p<0.05	2014	0.40
Return on capital employed	Profitability	Financial performance	p<0.05	2014	0.37
Return on equity	Profitability	Financial performance	p<0.05 p<0.10	2014 2015	0.51 0.29
Market capitalisation		Financial growth	p<0.05 p<0.05	2014 2015	0.31 0.31

Source: Own research

In terms of the ratio classes, Table 4.34 above indicates that one ratio (EBITDA), which resorts under the debt management class, provided a significant positive correlation in 2014. This result implies that the ratio increased as the companies' IRG quality improved.

Two ratios included in the market ratio class pointed out significant correlations: dividend yield increased with the improvement of IRG quality during 2016, whereas the dividend cover ratio unexpectedly decreased as the quality of IRG increased from 2014 – 2016.

Six ratios of the profitablility class delivered significant correlations. The findings for gross profit % was clear: the ratio increased when IRG quality improved for all four years under investigation. The net profit % ratio only had a significant positive correlation with IRG quality for 2014. The EBITDA margin ratio was also consistent by correlating positively with IRG quality for three of the years under investigation (2014 – 2016). Both net operating profit after tax and return on capital employed only showed a significant positive correlation with IRG quality for 2014. Return on equity improved together with the increase in IRG quality for the years 2014 and 2015. All the ratios in the profitability class had significant positive correlations, thus improved ratios with an increase in the EIRAs' rating.

Finally, the market capitalisation figure also provided substantial positive correlations.

The strongest finding was gross profit % that showed significant correlations over all four years; thereafter, EBITDA margin and dividend cover provided significant findings over three years. However, the correlations for dividend cover registered negative. Ratios for both the return on equity and market capitalisation provided significant correlations in two years.

Regarding the indicator categories, one ratio resorting under the category of financial performance or risk, was identified as significant and two under the financial performance or growth categories. The six profitability ratios are also classified as financial performance ratios and the market capitalisation figure resorts under the financial growth category.

Repeated measures ANOVA

The repeated measures ANOVA analysed the relationship between the financial indicators for different rankings of the EIRAs for companies over the period of 2014 – 2017. The following significant findings were registered as reported in Table 4.35 below.

Table 4.35 Synopsis of statistical findings – repeated measures ANOVA

Financial indicator	Ratio class	Financial indicator category	Significant with 'Time*Rating'	Significant with p<0.05	P-value
Fixed-asset turnover	Asset management	Financial performance/ growth	✔	p<0.10	0.08
Total asset turnover	Asset management	Financial performance/ growth	✔	p<0.10	0.098
Earnings yield	Market ratios	Financial performance/ growth	✔	p<0.10	0.093
Debt to equity	Debt management	Financial risk	✔	p<0.05	0.044

Source: Own research

From the findings presented in Table 4.35, it is evident that two ratios, resorting within the asset management class (i.e. fixed-asset turnover and total asset turnover), showed significant p-values. This result indicated a difference when the means of these ratios were compared for an interaction between time (which year) and rating (1, 2, 3, and 4).

When interpreting the relevant graph (Figure 4.1) for the fixed-asset turnover ratio, it became clear that the means of rating-2, -3 and -4 companies were fairly similar over the four year period. The significant difference was identified with rating-1 companies, which provided the rating with the highest fixed-asset turnover for all years. The graph depicted the figures in both 2014 and 2015 for rating-1 companies as much higher than the figures for the other ratings. The means of rating-1 companies increased to an impressive figure in 2016 with a slight decrease in 2017.

The total differences in total asset turnover were illustrated in Figure 4.2. The means of the total asset-turnover ratio was found to be ranging only between 1.12 and 1.91. Rating 2 was established as the rating with the highest total asset turnover. Rating-2 and -4 companies provided significant movements. The means of rating-2 companies improved from 2014 – 2016, with a noteworthy decline in 2017. Rating-4 companies showed a substantial decrease from 2014 – 2016. The differences for rating-3 and -4 companies were found to be without economic significance.

Contrary to findings with Spearman's rank-order correlation technique, earnings yield indicated a significant positive relationship with IRG quality for the market ratio class. The various ratings depicted in Figure 4.3 responded differently over the years. The means of rating-4 companies showed a notable decline from 2014 – 2015, with a further decline in 2016, but an increase to 6.15 in 2017. This is contrary to rating-2 companies that showed an

improvement in means from 2014 – 2016. The means of rating-1 companies decreased from 2015 – 2017; on the other hand, the figures of rating-3 companies increased from 2015 – 2017.

The final significant finding through the repeated measures ANOVA was identified in the debt to equity ratio. The means of this ratio falls within 0.92 and 2.04. Unexpectedly, rating 3 and 4, the two best ratings, provided the highest average debt to equity figures, which are not preferable. Rating 1 also indicated the lowest ratio of average debt to equity, which demonstrates that these companies' debt gearing was low. The movement in means of rating- 1 and -4 companies are not noteworthy. The means of rating-3 companies provided an increase from 2014 – 2015, with a decrease from 2015 – 2017. Rating-2 companies showed a decline in means each year.

From the perspective of financial indicator categories, it is clear that three ratios with significant findings resort under the categories of financial performance and financial growth and only one under the category of financial risk.

Table 4.36 below summarises all 21 financial indicators together with the findings of the three statistical approaches.

Table 4.36 Summary of all findings

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA
Inventory turnover	Inventory ratio weakened as IRG quality increased.	No significant effect	No significant effect
Average debtors collection period	Average debtors collection period ratio weakened as IRG quality increased.	No significant effect	No significant effect
Fixed-asset turnover	No noteworthy effect	No significant effect	Significant with $p<0.10$ (worse rating provided highest ratio)
Total asset turnover	No noteworthy effect	No significant effect	Significant with $p<0.10$ (best rating provided lowest ratio and second-lowest rating, best ratio)
Times interest earned	No noteworthy effect	No significant effect	No significant effect
EBITDA	EBITDA ratio improved as IRG quality increased.	Significant with $p<0.05$ for 2014 (positive correlation)	No significant effect

Table 4.36 Summary of all findings (continues)

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA
Fixed charge coverage	Selected but not tested, as explained in par. 3.5.3.	Selected but not tested, as explained in par. 3.5.3.	Selected but not tested, as explained in par. 3.5.3.
Dividend yield	Results were inconsistent and no conclusion can be drawn about the relationship of the ratios for the dividend yield % and the quality of IRG.	Significant with $p<0.05$ for 2016 (positive correlation)	No significant effect
Earnings yield	Earnings yield ratio improved as IRG quality increased.	No significant effect	Significant with $p<0.10$ (results were inconsistent and no conclusion can be drawn about the relationship of the earnings yield % ratio and the quality of IRG)
Price-earnings	No noteworthy effect	No significant effect	No significant effect
Dividend cover	The dividend cover formula weakened as IRG quality increased.	Significant with $p<0.10$ for 2014 – 2015 Significant with $p<0.05$ for 2016 (negative correlations)	No significant effect
Gross profit %	Gross profit % improved as IRG quality increased.	Significant with $p<0.10$ for 2017 Significant with $p<0.05$ for 2014 – 2016 (positive correlations)	No significant effect
Net profit %	No noteworthy effect	Significant with $p<0.05$ for 2014 (positive correlation)	No significant effect
EBITDA margin	No noteworthy effect	Significant with $p<0.05$ for 2014 – 2016 (positive correlations)	No significant effect
NOPAT	NOPAT ratio improved as IRG quality increased.	Significant with $p<0.05$ for 2014 (positive correlation)	No significant effect
Return on capital employed	No noteworthy effect	Significant with $p<0.05$ for 2014 (positive correlation)	No significant effect

Table 4.36 Summary of all findings (continues)

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA
Return on invested capital	Selected but not tested, as explained in par. 3.5.3.	Selected but not tested as explained in par. 3.5.3	Selected but not tested as explained in par. 3.5.3
Return on equity	No noteworthy effect	Significant with $p<0.10$ for 2015 Significant with $p<0.05$ for 2014 (positive correlations)	No significant effect
Debt ratio	No noteworthy effect	No significant effect	No significant effect
Debt to equity	No noteworthy effect	No significant effect	Significant with $p<0.05$ (debt to equity provides worse ratios as IRG quality increased)
Market capitalisation	No noteworthy effect	Significant with $p<0.05$ for 2014 – 2015 (positive correlation)	No significant effect

Source: Own research

By examining Table 4.36, it is evident that the results are mixed. No ratios demonstrated significant or noteworthy findings for all three methods. The times interest earned, price-earnings and debt ratio illustrated no significant or noteworthy findings for all three methods. The ratio of EBITDA, gross profit % and net operating profit after tax showed an improvement as IRG quality increased (descriptive statistics) as well as a positive significant correlation with the Spearman technique. The descriptive statistics of dividend cover showed that the ratio weakened as IRG quality increased, while Spearman's rank-order indicated a negative correlation between the ratio and IRG quality. Significance were noted for different years and for different ratios when considering the employed statistical methods.

Par. 2.2.2 outlined a study by King (2017) who found that the 40 companies which prepared an IR, improved its performance in both bottom line and share price than the 40 companies which did not prepare their IR. In this regard, evidence was found confirming that the quality of IRG generally improves financial performance, growth and risk to a certain extent. Nevertheless, the present study could not confirm King's findings as undisputedly.

Table 4.37 below compares the empirical findings of the present study to those of prior studies (as was demonstrated in Table 2.3). Where the present study concurred with previous studies in this field (as was explicated in chapter 2), the findings are indicated in bold.

Table 4.37 Comparisons between the results of the present study and previous studies

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA	Previous studies
Inventory turnover	Inventory ratio weakened as IRG quality increased.	No significant effect	No significant effect	Not tested
Average debtors collection period	Average debtors collection period ratio weakened as IRG quality increased.	No significant effect	No significant effect	Not tested
Fixed-asset turnover	No noteworthy effect	No significant effect	Significant with $p<0.10$ (worse rating provided highest ratio)	Not tested
Total asset turnover	No noteworthy effect	No significant effect	Significant with $p<0.10$ (best rating provided lowest ratio and second-lowest rating, best ratio)	Not tested
Times interest earned	No noteworthy effect	No significant effect	No significant effect	Not tested
EBITDA	EBITDA ratio improved as IRG quality increased.	Significant with $p<0.05$ for 2014 (positive correlation)	No significant effect	Not tested
Fixed charge coverage	Selected but not tested, as explained in par. 3.5.3.	Selected but not tested as explained in par. 3.5.3	Selected but not tested as explained in par. 3.5.3	Not tested
Dividend yield	Results were inconsistent and no conclusion can be drawn about the relationship of the ratio of dividend yield % and the quality of IRG.	Significant with $p<0.05$ for 2016 (positive correlation)	No significant effect	Not tested

Table 4.37 Comparisons between the results of the present study and previous studies (continues)

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA	Previous studies
Earnings yield	Earnings yield ratio improved as IRG quality increased.	No significant effect	Significant with p<0.10 (results were inconsistent and no conclusion can be drawn about the relationship of the earnings yield % ratio and the quality of IRG)	Not tested
Price-earnings	No noteworthy effect	No significant effect	No significant effect	Not tested
Dividend cover	The dividend cover formula weakened as IRG quality increased.	Significant with p<0.10 for 2014 – 2015 Significant with p<0.05 for 2016 (negative correlations)	No significant effect	Not tested
Gross profit %	Gross profit % improved as IRG quality increased.	Significant with p<0.10 for 2017 Significant with p<0.05 for 2014 – 2016 (positive correlations)	No significant effect	Not tested
Net profit %	No noteworthy effect	Significant with p<0.05 for 2014 (positive correlation)	No significant effect	Not tested
EBITDA margin	No noteworthy effect	Significant with p<0.05 for 2014 – 2016 (positive correlations)	No significant effect	Not tested
Net operating profit after tax	**NOPAT ratio improved as IRG quality increased.**	**Significant with p<0.05 for 2014 (positive correlation)**	No significant effect	**Positive association between ratio & IRG**

Table 4.37 Comparisons between the results of the present study and previous studies (continues)

Financial ratio/indicator	Descriptive statistics	Spearman's rank-order correlation	Repeated measures ANOVA	Previous studies
Return on capital employed	No noteworthy effect	Significant with p<0.05 for 2014 (positive correlation)	No significant effect	Not tested
Return on invested capital	Selected but not tested, as explained in par. 3.5.3	Selected but not tested, as explained in par. 3.5.3	Selected but not tested, as explained in par. 3.5.3	Negative association between ratio & IRG
Return on equity	No noteworthy effect	**Significant with p<0.10 for 2015 Significant with p<0.05 for 2014 (positive correlations)**	No significant effect	**Positive association between ratio & IRG**
Debt ratio	**No noteworthy effect**	**No significant effect**	**No significant effect**	**No significant effect**
Debt to equity	No noteworthy effect	No significant effect	Significant with p<0.05 (debt to equity provides worse ratios as IRG quality increased)	Not tested
Market capitalisation	No noteworthy effect	Significant with p<0.05 for 2014 – 2015 (positive correlation)	No significant effect	Not tested

Source: Own research

As indicated by Table 4.37 above (in bold type), only three financial indicators tested in the present study, were also evaluated in previous studies. This study concurs with previous studies, which concluded that the return on equity and net operating profit after tax of a company increases as the level of IR improves. It was found and correspond with a previous study, that the debt ratio demonstrated no significant effect in the level of IRG.

From the table above, it is apparent that, where the same ratio was tested in the present study and in previous studies (see chapter 2), the findings correspond.Finally, a summary of the chapter follows.

4.7 CHAPTER SUMMARY

Based on the empirical objectives of the study, the aim of chapter 4 was to deliver appropriate empirical research findings. The collected data were analysed and interpreted to attain the set objectives and to shed light on the problem statement as presented in chapter 1. To ensure the empirical objective was achieved, the data were analysed in four steps, which were outlined in the following four paragraphs (see Table 4.1):

a. Descriptive statistics (par. 4.3);
b. Spearman's rank-order correlation technique (par. 4.4);
c. Repeated measures analysis of variance (ANOVA) (par. 4.5); and
d. Interpretation of the final results (par. 4.6).

Chapter 4 considered the results and findings of the data analysis. Three statistical approaches were followed, namely descriptive statistics, correlation technique and repeated measures ANOVA. The data analysis were done annually, during the period 2014 – 2017 by applying both descriptive statistics and Spearman's rank-order correlation technique. The repeated measures ANOVA determined the four years in aggregate.

The descriptive statistics comprised an analysis of financial ratios, described over four years following EY's Excellence in Integrated Reporting Awards (EIRAs) rankings of companies. The following indicators weakened as the quality of integrated reporting (IRG) increased: ratios for inventory, average debtors collection period and dividend cover. Certain ratios improved as IRG quality increased: earnings yield, earnings before interest, taxes, depreciation, and amortisation (EBITDA), gross profit % and net operating profit after tax (NOPAT). However, the ratio of dividend yield provided inconsistent results. Therefore, no conclusion could be drawn about the relationship of the latter ratio and the quality of IRG.

Spearman's rank-order correlation technique reported various findings. Significant findings were made during various years over the four-year period. It was found that a quality integrated report (IR) may improve the following ratios in the profitability class (financial performance indicator category): gross profit %, net profit %, EBITDA margin, net operating profit after tax, return on capital employed, and return on equity. A positive correlation was also identified for the EBITDA ratio in the class, debt management (financial performance/risk indicator category).

Within the market ratio class, dividend yield provided a positive correlation, whearas dividend cover indicated negative correlations. The market ratio class resorts under financial performance

or growth indicator categories. Finally, the market capitalisation figure indicated a positive correlation, as part of the financial growth indicator category.

Taken together, the evidence from Spearman's rank-order correlation suggests that the benefit of an increased financial indicator due to high-quality IRs (measured by the EIRAs) could only be recognised within certain ratio classes and for specific years.

The repeated measures ANOVA reported various findings with mixed results, which is not always similar to the findings produced by Spearman's rank-order correlation. Significant p- values were found for the ratios fixed- and total asset turnover in the asset management class (financial performance/growth indicator categories). The significant difference with the fixed-asset turnover was that rating-1 companies showed much higher means than the other ratings, for all four years under investigation. This indicates, therefore, that the worst IRG resulted in the highest fixed-asset turnover ratios. The significant differences in total asset turnover were found in rating-2 and -4 companies, which indicated significant movements. Rating 2 (second-lowest EIRAs' rating) demonstrated the best ratio figures, whereas the best EIRAs' rating demonstrated the lowest ratios.

The ratios for earnings yield which resort under the market ratio class (financial performance/growth indicator categories) indicated various movements over the years. Different ratings show the highest ratio figure over the four-year period, making it challenging to conclude on the effect the IRG quality has on the ratio figures.

The final significant finding derived from the repeated measures ANOVA concerned the debt to equity ratio, which resorts under debt management (financial risk indicator category). The two best ratings provided the highest average debt to equity figures, which is not preferable. Rating 1, the worst rating, also indicated the lowest ratio of average debt to equity.

The evidence thus suggests that IRG quality impacts the financial ratios of companies in various ways. The three statistical approaches delivered noteworthy findings for certain financial indicators, and not consistently the same indicators.

The research question or problem was resolved through the conducted research (Mouton, 2001:53). This chapter reported on attaining the empirical objective of the present study by demonstrating the impact of IRG on financial indicators of selected companies. By applying three selected empirical methods, it was found that IRG as such does have various significant effects on companies' financial indicators.

Furthermore, it was established that these findings concur with those of previous studies (outlined in ch 2), where similar ratios were analysed. In the closing chapter (ch 5) to follow, the present study is summarised, conclusions drawn and recommendations made for future research.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

"In some ways, I think of integrated reporting as one effort to begin to restore society's trust"
(Eccles, Cheng & Saltzman, 2010)

5.1 INTRODUCTION

The increasingly popular integrated report (IR) is becoming the norm for the best practices of companies that are viewed as successful (Ahmetshina, Kaspina & Molotov, 2018:1). Integrated reporting (IRG) enjoys buy-in from various sectors such as international firms (e.g. Microsoft, HSBC, Nestle), standard setting bodies (e.g. International Accounting Standards Board), stock exchanges (e.g. Tokyo Stock Exchange Group), the World Business Council for Sustainable Development (WBCSD) and the World Economic Forum and Transparency International (Stubbs & Higgins, 2018:3). This form of reporting has also led the way to change in legislation within South Africa, Brazil, United Kingdom (UK) and France (EY, 2014b).

An IR communicates and explains a company's future value-creation plans in an integrated manner, while focusing on non-financial information such as social and environmental disclosures (De Villiers & Maroun, 2018). The IIRC (2011:1) believes that IRG will meet the demands of the 21st century. IRG will function as a reporting framework that accommodate complex matters better, and in the process, combine the various components of reporting into one coherent, integrated piece (IIRC, 2011:1). The International Integrated Reporting Committee (IIRC) is of the opinion that IRG should become the universal norm for companies' reporting which aims to satisfy the needs of investors (Bernardi & Stark, 2018:1).

The financial indicators of a company are crucial to various stakeholders. This especially applies to accounting information, from which derived the financial indicators related to financial performance, risk and growth. Such indicators are vital to help investors assess the financial well-being of a company. Since the issuing of an IR is a costly endeavour, companies seek assurance that this instrument is worthwhile. The significance of financial indicators was also confirmed by several previous studies that examined the relationship between IRG and financial indicators.

The mentioned relationship was studied by various researchers such as Barth *et al.* (2016), Lee and Yeo (2016a), Zhou *et al.* (2017), Baboukardos and Rimmel (2016) and Churet and Eccles (2014). From this previous research, various findings were identified. However, similar prior studies have not attempted to determine how IRG can be linked to financial indicators, as selected for and discussed in the present study. The focus was on the financial capital due to its importance

for the various stakeholders. Therefore, the following research question was posed: ‘’How does IRG affect financial indicators of a company?’

The primary and secondary research objectives were detailed to ensure the research question is answered. Chapter 5 specifies how each identified research objective was attained in answer to the research question (par. 5.2). Based on the findings of the present research, certain research limitations (par. 5.3) are identified and suggestions made for areas of further research (par. 5.4).

5.2 RESEARCH OBJECTIVES

Objectives (primary or secondary) can be seen as a study’s goals to be achieved (Kumar, 2019:50). According to Kumar (2019:50), the primary objective is the key discovery that should be made in the study, while the secondary objectives consists of the detailed aspects that should be explored to assist in the main discovery. The objectives of the present study were identified in par. 1.4. In terms of this chapter, these objectives are exemplified in Figure 5.1 below, linked to the applicable paragraphs.

Figure 5.1 Research objectives

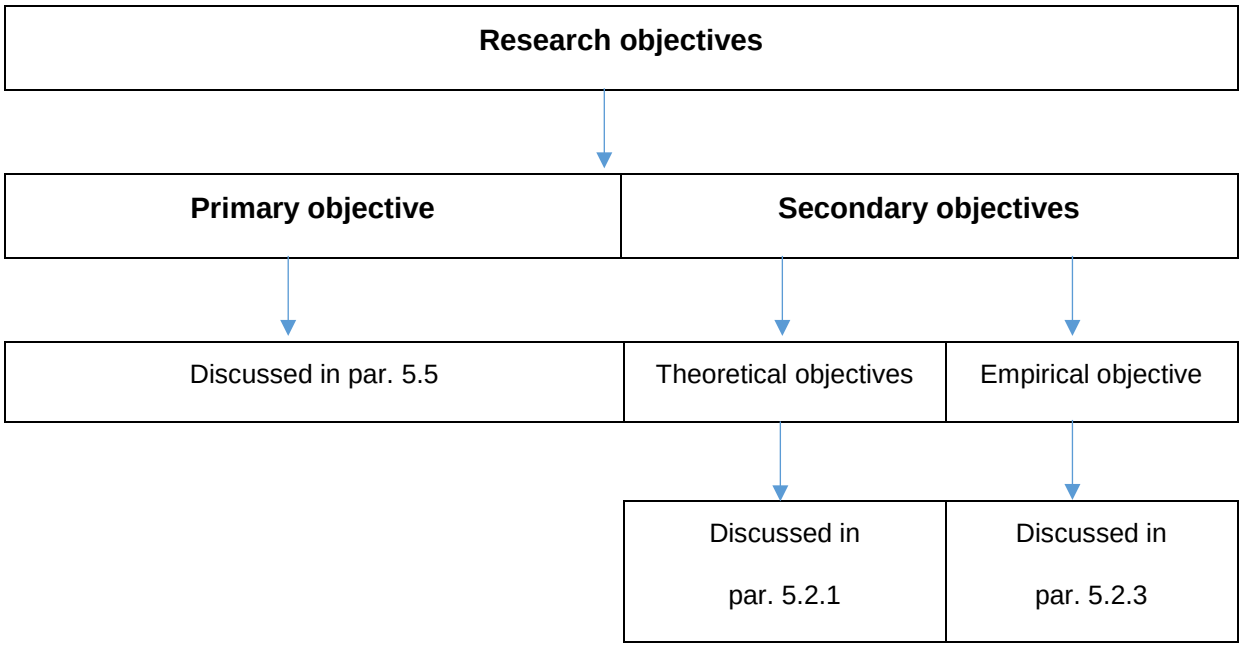


Figure 5.1 above depicts the division in primary and secondary objectives. The primary objective of the study was to determine the impact IRG has on financial indicators of companies (as indicated in par. 1.4.1). Secondary objectives (theoretical and empirical) were identified in order to achieve the primary objective. In the following section, each type of secondary objective is explained separately, together with details of how it was reached. Par. 5.5 provides the chapter summary, also explaining how the primary objective was reached.

5.2.1 Theoretical objectives

Par. 1.4.2 presents the three theoretical objectives that were acknowledged. In the following paragraphs, each secondary theoretical objective is explained and how it was achieved. Figure 5.2 below outlines the paragraphs where the different secondary objectives are to be discussed in this chapter, along with the paragraphs where it were discussed previously (chapter 2).

Figure 5.2 Links between secondary theoretical objectives and main paragraphs

Paragraph in chapter 2		Objective and paragraph in chapter 5
Par. 2.2: Importance of integrated reporting	→	Secondary objective a: par. 5.2.1.1
Par. 2.3: Importance of financial indicators	→	Secondary objective b: par. 5.2.1.2
Par. 2.4: Document analysis of the effect IRG has on financial indicators	→	Secondary objective a and b: par. 5.2.1.3
Par. 2.5: Analysis of financial ratios	→	Secondary objective b: par. 5.2.1.4
Par. 2.6: Explanation of EY's 'Excellence in Integrated Reporting Awards'	→	Secondary objective c: par. 5.2.1.5

5.2.1.1 Determine the importance of IRG through a literature review – importance of integrated reporting

Par. 2.2.1 commenced by examining the journey towards IRG. This process started off with the issuing of the earliest King report, a "code on corporate governance", in 1994. The International Financial Reporting Standards (IFRS) were presented in 2001 with the primary aim of standardising financial reporting. South Africa implemented the IFRS in 2005, requiring of all Johannesburg Stock Exchange (JSE) -listed companies to comply with these standards. A revised King report, King II, was published in 2002, emphasising the need to include reporting on social and environmental aspects. Due to the global financial crisis in 2008 that created a worldwide recession, King III was released in 2009. Gradually it became clear that traditional reporting no longer addressed risks sufficiently.

The third King report thus promoted IRG to build the confidence and trust of its stakeholders by explaining how a company creates value to all stakeholders. Listed companies in South Africa were required from 2010 onwards to apply IRG or explain why they failed to do so. The IIRC issued its International Integrated Reporting Framework (IIRF) in 2013 to function as a universally accepted reporting framework which guides companies on ways to prepare an IR. The King IV

report was issued in 2016, emphasising the importance of IRG with its six capitals in mind. In the present study, Figure 2.2 illustrated the excursion to IRG since the beginning of the 21st century, with the main transformation the shift in focus from the financial capital to include all relevant capitals.

The purpose of IRG, in its focus on all capitals, was considered in par. 2.2.2. Companies exert enormous influence on the world and its people; currently, certain companies even boast economies that exceed those of governments. In this regard, a seemingly minor misstep can lead to major consequences. Therefore, it should be a main concern for companies to report on all capitals, seeing that mistakes could occur in any of the capitals, which may impact investors and other stakeholders. Investors require accurate information when making investment choices. The reason is clear: these companies are accountable to large amounts of financial, natural, and human resources ("capitals" according to the IIRF). Thus it became apparent that IRG is essential in meeting the growing expectations of investors and stakeholders for transparency and accountability.

Instead of the retrospective communication of existing financial and sustainability reports, IRG offers future-oriented information since it communicates all relevant factors that substantially impact the ability of an entity to add value in the short, medium and long term. A survey's responses showed that 79% of companies issuing an IR believe that this process give providers of financial capital more assurance in the long-term feasibility of their business models (Black Sun Plc, 2014:18). This means IRG will help inform stakeholders who show increased interest in the long-term sustainability of the company.

IRG is becoming increasingly popular within the corporate environment. A study was conducted to compare companies which did not prepare an IR to those companies who had King (2017). The companies that prepared an IR indicated a better bottom line as well as share price than the ones that neglected such a mechanism King (2017). From the literature, three types of benefits of IRG were identified and discussed: internal company benefits, external market benefits and the fact that IRG manages regulatory risk.

It was concluded that IRG is an imperative journey for a company; thus this process and its impact is worth researching. Research has shown that investors wish to know the influence IRG exerts on the company's financial performance. (The financial aspect of company disclosure will be discussed in par. 5.2.1.2, where secondary objective b is addressed.)

5.2.1.2 Explain the importance of financial performance, risk and growth of a company, as well as the ratios used to analyse these indicator categories – importance of financial indicators

Secondary objective b was dealt with in par. 2.3, 2.4 and 2.5. In this case, it was demonstrated that financial indicators are essential for stakeholders to assess a company's performance. Par. 2.3.1 started off by defining financial performance, risk and growth and its importance.

Various sources define 'financial performance' as the measuring of a company's financial results. It was concluded that a company's financial performance is significant, seeing that it measures the company's financial health. 'Risk' implies the chance of incurring losses when the actual results differ from anticipated ones. 'Financial risk' in particular refers to a financial loss (e.g. investment loses value) due to a lower actual return than expected. Financial risk is considered as important due to various reasons. It may affect several stakeholders; financial losses may lead to job losses; payments to creditors may be forfeited; or investors may lose their investment's value. 'Growth' in general means to expand or to increase. Financial growth in particular indicates that a company's performance is improving annually. For the purpose of the present study, 'growth' referred to increased financial ratios or values.

The present study combined the above-mentioned three terms under a singly denominator: *financial indicator categories.* These terms are vital to consider as components of an integrated whole, seeing that companies' financial performance may be exceptional, even though they are facing various risks, which in certain circumstances may impede financial growth. The IIRF does not propose key performance indicators (KPIs) but an IR must explain material information on the performance of a company as well as the impact on its financial capital. The primary source of accounting information about a company's performance is its financial statements. Due to the prominence of the above-mentioned accounting information, the use of financial indicators was examined in par. 2.3.2.

Par. 2.3.2 evaluated investors as users of financial indicators. The IIRF determines that the main users of an IR are the providers of financial capital. The present study established that investors reflect on several factors before making decisions on investing in a company. From the various factors, accounting information was identified, as the crucial one, which will indicate financial performance, risk and growth.

Accounting information is provided in companies' annual reports, financial statements and prospectuses, and at present, the IR. Research has indicated that investors focus strongly on analysing financial statements to examine a company's performances and make investment decisions. It was found that investors seemingly only incidentally reflect on typical modern issues such as national or international operations, the environmental performance history and the

company's ethical standpoint. Instead, investors focus on the projected accounting performance of a company. It was concluded that investors give priority to accounting information, from which they can assess financial indicators related to financial performance, risk and growth. These indicators give investors a holistic view on the financial health of a company.

Par. 2.3.2 established the importance of financial indicators to other users besides investors, for example: employees, management, creditors and the general public. It was thus concluded that accounting information and its analysis allow the numerous users of these financial statements to assess whether the company caters for their best interests. The following paragraph evaluates the document analysis done to attain secondary objectives a and b.

5.2.1.3 Determine the importance of IRG through literature review; and explain the importance of financial performance, risk and growth of a company, as well as the ratios used to analyse these indicator categories – document analysis on the effect of IRG on financial indicators

Secondary objectives a and b were explored in par. 2.4. A summary was delivered combining 11 former studies that examined the effect of IRG on specific financial indicators.

Focusing particularly on the financial performance, risk and growth of a company, the findings of the mentioned 11 studies were investigated. These findings demonstrated that 81% of financial indicators, classified as *financial performance indicators* (25 out of 31, which indicated a significant result), was associated positively with quality in IRG (Table 2.3). In addition, 86% (6 out of 7) of these mentioned indicators, classified as *financial risk indicators,* demonstrated a significant result that was associated positively with IRG quality. Furthermore, 80% (4 out of 5) of the financial indicators, classified as *financial growth indicators,* indicated a positive association with IRG quality.

The importance of financial indicators was emphasised, not only since researchers consider such indicators as a statistical variable, but also because more than half of these indicators showed a positive association with IRG quality. From the preceding studies, it was evident that financial indicators provide important information to the various stakeholders. The present study found that to date limited ratios were tested in the various categories of financial indicators. The reason is that most of the previous studies used their own financial indicators which they regarded as important. These studies were also limited to the year 2015 and most did not evaluate the ratios in terms of the quality of the IR.

In the following paragraph, the analysis of financial ratios are discussed in answer to secondary objective b.

5.2.1.4 Explain the importance of financial performance, risk and growth of a company, as well as the ratios used to analyse these indicator categories – analysis of financial ratios

Secondary objective b was considered further in par. 2.5. It was demonstrated that financial ratios are popular due to their apparent usefulness when companies make financial decisions. Financial ratios are an effective analysing instrument since ratio analysis allows the analyst to recognise financial trends and compare the financial results of several companies in similar industries. It was established that financial ratios contributed to the purpose of the present study since it helped establish whether IRG impacts on financial indicators. Ratios were regarded to be a worthy indicator of financial performance, risk and growth.

Par. 2.5 furthermore found that the financial statements consist mainly of a statement of profit or loss and other comprehensive income (SoCI); the statement of financial position (SoFP); statement of changes in equity (SoCE); the cash flow statement (CFS); and relevant notes. All these statements are included in an IR and ratios in each of these statements have a different use in telling the full story of a company.

Par. 2.5.1 explained the different outlooks of scholars on the classification of ratios. Correia's six classes of financial ratios were identified and described in detail: liquidity, profitability, cash flow, asset management, debt management, and market value. In this regard, the present study focused on ratio classes relevant to financial performance, growth and risk. These classes, however, excluded liquidity and cash flow due to its short-term focus as opposed to the longer-term focus of IRG.

The three financial indicators examined frequently in the 11 previous studies, were the market value of equity (7 studies), leverage (6 studies) and total assets (5 studies). *Market value of equity* was covered by examining the market capitalisation figure of companies. *Leverage and total assets* were covered by considering the total asset turnover and debt to equity ratios under the ratio classes of asset and debt management.

The financial indicators included in the financial performance indicator category were dealt with in par. 2.5.2, starting off with a motivation for selecting the inventory turnover ratio. The mentioned ratio specifies how the company is managing its inventory, a significant asset for such enterprises. The study furthermore established the importance to consider the average collection period for debtors, seeing that quicker cash collection is desirable for any company. The fixed-asset turnover ratio measures capital intensity, in other words, how resourcefully a firm uses its plant and equipment to generate a turnover. The total asset turnover ratio was also included to analyse how efficiently a company is managing all its assets. All four the above-mentioned ratios were included in the class of asset management.

For the debt management class, the ratio of times interest earned was found especially valuable for foreseeing financial distress. This ratio was included as a virtuous indicator of whether companies can manage their debt on which interest is typically incurred. The ratio of earnings before interest, taxes, depreciation, and amortisation (EBITDA) was selected since it is crucial when analysing debt management. The reason is that EBITDA identifies the earnings available to cover interest and debt. The ratio of coverage of fixed charges was pointed out as a tool measuring a company's capability to fulfil fixed charges, for example interest and lease expenses.

Thereafter, market ratios were included in the financial-performance ratio class. The dividend yield was identified as one of the ratios which investors examine closely to assess companies' dividend payments. The earnings yield, on the other hand, specifies earnings as a percentage of each 1 dollar, pound, rand, et cetera invested in a company. Numerous researchers indicated that the price-earnings ratio is one of the most significant ones, seeing that it specifies the amount investors are prepared to pay for reported profits. The dividend cover ratio is valid for all investors but especially important for preference shareholders since it calculates a company's ability to pay a dividend.

Finally, profitability ratios included in the ratio class of financial performance, were explained. The ratio of gross profit % was included since it provides evidence of the company's pricing, the structure of costs and the efficiency of production, by establishing the capability of management to minimise the cost of goods sold relative to its sales. The net profit % was selected to be analysed, assessing the inclination of companies to manage their expenses. This inclination explains how well a company manages its sales in relation to its expenses. The EBITDA margin in particular evaluates the operating profitability of a company as a percentage of its total revenue. This margin was identified as a valuable measurement tool to compare the profitability of several companies without the effects of decisions linked to "financing and accounting".

Net operating profit after tax (NOPAT) is a further ratio that helps determine earnings. The various formulas for this ratio were listed, but the present study only used earnings before interest and tax (EBIT) in the formula. The return on capital employed (ROCE) measures the profitability and effective use of capital investments made by a company. The study found more than one option for the numerator and explained that NOPAT should be divided by net operating assets to define ROCE in this study.

Furthermore, return on invested capital (ROIC) was identified as performance measure which asesses the relationship between NOPAT and operating capital, thus ROIC measures the amount of NOPAT generated by one dollar of operating capital. This ratio was used in the present study to measure the profitability of a company to its investors. The literature review found researchers agreeing that return on equity (ROE) is easily the most popular ratio amongst investors and senior

management, by which to conclude on the financial performance of a company. This ratio demonstrates the shareholder's share of the profit generated by the company.

In par. 2.5.3, financial indicators included in the financial risk class were discussed. The focus was especially on the debt ratio that stipulates the value of assets that are financed not internally, but externally. It was found that various analysts consider this a respected ratio, seeing that it indicates how dependent a company is by borrowing from third parties. The debt to equity ratio identifies the value of a company's finance or funding that is internal (equity) instead of external (debt). This points to the degree a company depends on financing through debt. It was also found that the financial performance indicator category includes the following ratios as well: times interest earned, EBITDA, and fixed charge coverage.

Par. 2.5.4 explained that the financial growth class contains the four ratios included in the asset management class and the four that resort under the market ratio class. All of these classes form part of the financial performance as well as the financial growth indicator category. These ratios were discussed previously under par. 2.5.2 as well as above. The market capitalisation figure resorts under the financial growth indicator category and point out the total currency market value of a company's outstanding shares. This figure is reached by multiplying the outstanding shares of a company by the existing market price of a single share. Investors examine this figure to establish the company's size as an alternative to using figures of sales or the total assets.

Secondary objective b was achieved by determining the above-mentioned as the 20 ratios and the market capitalisation figure to be analysed as financial indicators of a company's performance, risk and growth. It was determined that these examples cover the most popular ratios used by stakeholders when assessing companies. The identified 21 also covered the gap in prior research. Most of these ratios have not yet been investigated by empirical research focusing on the effect of IRG on financial indicators. To date, only three of the ratios used in the 11 previous studies were also identified in the present study. Furthermore, seven of the 11 previous studies investigated correlations between the ratios and IRG, whereas only four (studies 1, 2, 3 and 7) examined the relationship between the ratios and IRG strength, as was done in the present study.

In par. 5.2.1.5, the EY's Excellence in Integrated Reporting Awards (EIRAs) were discussed in an attempt to meet secondary objective c.

5.2.1.5 Explanation of EY's EIRAs

It was indicated that the purpose of these mentioned awards is being used as benchmark to evaluate the quality of IRG for all relevant stakeholders of South Africa's listed companies.

From 2012, EY's reporting awards assessed the quality of IRs from South Africa's top companies. The companies that are appraised each year are the top 100 listed at the JSE, based on their market capitalisation as at 31 December or the final working day of the previous year. For the

EIRAs for 2018, the IR or annual report for the year ended on or before 31 December 2017 of the designated companies were assessed. EY do not reveal the final scores of the refereed reports of the companies; rather categorises the companies in terms of: ‘Excellent’, ‘Good’, ‘Average’ or ‘Poor’. Companies that are becoming increasingly devoted to the journey towards IRG, are ranked as ‘Excellent’ or ‘Good’.

The EIRAs for 2018 were graded by three independent specialists in financial reporting. The mark plan was improved annually as more information and clarity about IRG emerged. The mark plan for the EIRAs from 2015 – 2018 was built on the guiding principles and content elements expounded in the IIRF. A score out of 10 is given for each of the seven guiding principles as well as for each of the eight content elements. Marks are also given for the level to which the company’s IR embraces the fundamental concepts of the IIRF, by clarifying how value is created based on the six capitals. The IIRF and its draft version was therefore only used as basis of the mark plan from 2014 onwards. This period is in line with the time-frame covered in the data analysis described in chapter 3.

After establishing secondary objectives a, b and c, the research design and methodology were motivated and discussed in chapter 3 to ensure objective d, the empirical objective, could be attained.

5.2.2 Research design and methodology

Chapter 3 explored both the research design and methodology employed to reach the empirical objective. After introducing and explaining the research process, the research problem was posed (par. 3.3): “How does IRG affect financial indicators of a company?”.

The research design was determined by identifying four different dimensions (Figure 3.3). From these dimensions, it was concluded that the research design is a medium controlled empirical study based on numerical secondary data.

In par. 3.5.1, it was indicated that the study mainly used explanatory research to determine the relationship between IRG and the financial indicators of selected JSE-listed companies. Furthermore, applied research was used since the findings can impact the decisions by the IIRC, the management accountable for applying IRG in their respective companies, as well as the decisions taken by the companies’ other stakeholders. Finally, the study followed a mixed method research methodology that incorporates both qualitative and quantitative research designs.

The qualitative part of this study established the importance of IRG through a literature review and focused especially on the three indicator categories of financial performance, risk and growth of a company. The study also underlined the importance of the ratios used to analyse these three mentioned categories. Furthermore, a document analysis was done by reviewing previous studies to determine which financial indicators, according to their observation, have impacted IRG.

The quantitative methodology, on the other hand, was used to achieve a more profound understanding of the impact IRG has on financial indicators. Therefore, the financial indicators obtained from IRESS of JSE-listed companies were analysed based on the financial ratios determined through the literature review.

To determine the population for the present study, all JSE-listed companies as at 31 December 2017, were selected (par. 3.5.2.1). Judgement sampling was used to select the top 100 companies listed on the JSE as the initial sample from the population (i.e. all JSE-listed companies). These top 100 JSE-listed companies were chosen based on their market capitalisation as at 31 December 2017 according to EY's EIRAs for 2018. These 100 companies comprised 95% of the market capitalisation of the JSE at 31 December 2017. Judgment sampling was further applied by eliminating the industrial metals and mining companies within the industries for basic materials and financing, as explained in par. 1.5.4.

Data from financial ratios, the variable for the empirical study, were collected to measure the financial indicators. The IRESS database was used to gather data for the periods 2014 – 2017. Data that could not be collected under the period of review were indicated clearly in par. 3.5.3 and Table 3.8. Missing observations were due to JSE listings that occurred after the 2014 year-end. Two formulas, fixed charge coverage and return on invested capital, were not available on IRESS. Companies may report the numerator and denominator figures differently. Therefore the mentioned two formulas from the companies' financial statements were not calculated, since it may have led to inconsistent data.

Three statistical approaches were followed in the study. The descriptive statistics led to a bivariate analysis, with the two variables the IRG ranking and the financial indicators. Thereafter, Spearman's rank-order correlation was applied. Correlations specify the strength of association between variables. Thus, the study used Spearman's technique to examine how strongly the four years' ratios for the three financial indicator categories (financial performance, risk and growth) are related to the EIRAs' rankings. Finally, repeated measures ANOVA were performed to analyse the relationship between the financial indicators for different EIRAs' rankings of companies over the period 2014 – 2017.

Par. 3.5.5 explained that the data's validity and reliability were established by acknowledging that the IRESS database is a recognised and trustworthy source. In other words, the acquired ratios provided reliable information. The ratios were calculated in a trustworthy manner, seeing that they were deeply rooted in existing literature.

In par. 3.5.6, the ethical considerations for the study were discussed. It was pointed out that all the data were secondary and publicly accessible. Therefore, no ethical limitations were identified and ethical clearance was obtained from the relevant bodies.

Chapter 3 provided a detailed analysis of the research design and methodology applicable to the present study. After determining the research design and methods, the empirical objectives could be satisfied.

5.2.3 Empirical objective

In accordance with par. 1.4.2.2, a single empirical objective was identified, which is explicated below.

5.2.3.1 Determine the effect of IRG on financial indicators by analysing such indicators of JSE-listed companies.

Secondary objective d, the only empirical objective, was discussed in chapter 4. Collected variables (the financial indicators and the EIRAs' rankings) were sorted and analysed by the Statistica Version 13.3 software package and MS Excel, to capture the annual results (2014 – 2017). The purpose of this chapter was to determine the impact of IRG on the financial indicators of a company. The empirical findings, reported in chapter 4, are discussed in more detail below.

Descriptive statistics were provided and explained in par. 4.3 to recognise the patterns and characteristics of the variables. It was found that over the four-year period, almost each ratio brought a different movement in means. The descriptive statistics indicated that certain ratios declined as the IRG quality increased. These ratios covered the inventory, average debtors collection period and dividend cover. Other ratios increased as IRG quality improved, namely the ratios for earnings yield, EBITDA, gross profit % and NOPAT. However, the ratio of dividend yield delivered inconsistent results. Therefore no assumption could be drawn about the association of the latter ratio and the quality of IRG.

The second approach, Spearman's rank-order correlation was reported in par. 4.4. This technique was used to analyse how strongly the ratios correlate with EIRAs' rankings for companies. Nine of the 19 tested ratios illustrated a significant positive correlation. These ratios are EBITDA, dividend yield, gross profit %, net profit %, EBITDA margin, net operating profit after tax, return on capital employed, return on equity and market capitalisation. The positive correlation is evidence that quality IRs can improve certain ratios. Only the dividend cover ratio showed a negative significant correlation: as the IRG quality improved, the ratio deteriorated. In summary, most correlations were found in the indicator category of financial performance, thereafter in the category of growth and finally, in financial risk.

Thirdly, as explained in par. 4.5, the study applied repeated measures analysis of variance (ANOVA). The earnings yield ratio within the market class showed a significant effect. For the debt management class, the debt to equity ratio provided a noteworthy difference. The differences in each of these four ratios, however, varied significantly. The ANOVA approach indicated that three ratios with significant findings resort under the categories of financial performance and

financial growth, and only one under the financial-risk category. The mentioned ANOVA provided significant findings for the following ratios: fixed-asset turnover, total asset turnover, earnings yield, and debt to equity. These ratios indicated different movements in ratings and increases/decreases in ratio figures, which made it challenging to reach representative conclusions on the mentioned ANOVA findings.

It was found that only three financial indicators tested in the present study, were also evaluated in previous studies. These three financial indicators correspond with the findings drawn from the processed data in this study. Although the researcher attempted to follow the most appropriate research design and methods in this study, certain limitations and shortcomings must be factored in, which are identified and explained subsequently.

5.3 LIMITATIONS AND SHORTCOMINGS OF THE STUDY

The present study encountered the following limitations and shortcomings:

a. The statistical relations between EIRAs and financial indicators were measured for the top 100 JSE-listed companies. Since judgment sampling was used, it is untenable to generalise the findings to include other companies and countries.

b. Only certain financial indicators were included for the empirical research, as explained in chapter 2. Other or additional financial indicators may provide different findings.

c. The study covered four years of financial indicators under the literature review, seeing that the IIRF was issued only during December 2013. Empirical findings may differ if financial indicators were to be analysed for considerably longer periods.

d. The study relied on the financial indicators provided by IRESS Limited ('IRESS'). These indicators were, however, not recalculated or verified against each company's published financial statements; thus, incorrect data may have distorted the empirical findings.

e. The analysis relied on EY's EIRAs' rankings to determine the quality of IRs, which was not re-evaluated. In such a case, the findings of the present study may have differed.

5.4 RECOMMENDATIONS FOR FURTHER RESEARCH

The following areas have been acknowledged for further studies in this field:

a. Perform an identical study and test whether the EIRA ratings can influence different financial indicators.

b. Do a non-parametric analyses, where the sample is small and data non-normal.

c. Repeat this analysis of the top 100 JSE-listed companies, however, within an extended or different time-frame; ascertain whether findings are considerately different when a different period is reviewed.

d. Investigate other ways of evaluating the quality of IRG (other than EY's EIRAs) and evaluate its relationship with financial indicators.

e. Do a similar analysis of similar companies in other countries.

5.5 CHAPTER SUMMARY

This chapter provides an overview of the present study and deliberates how each of the specific research objectives was achieved. Limitations of the study were acknowledged and suggestions made for future studies.

In par. 1.4.1, the primary objective of the study was stated, namely to determine the impact of IRG on companies' financial indicators. After attaining the three theoretical secondary objectives, as well as the one empirical secondary objective, the primary objective was fulfilled.

The descriptive statistics delivered noteworthy observations, which indicated that certain ratios declined as the integrated reporting (IRG) quality increased, whereas other ratios improved as IRG quality increased. The study was not able to identify specific trends. It was found that IRG delivered several significant correlation coefficients during the period 2014 – 2017. Most of these noteworthy findings were derived from financial indicators within the profitability ratio class or financial performance indicator category.

The repeated measures analysis of variance (ANOVA) indicated a substantial average effect in two ratios of the asset management class (financial performance or growth indicator category). One significant finding emerged from the market ratio class (financial performance or growth indicator category) and one in debt management (financial risk indicator category). Quantitatively, the primary objective of the study was achieved by demonstrating that the effect of IRG on a company's financial indicators cannot be generalised as positive or negative.

By achieving the primary objective, the study answered the research question on how IRG affects a company's financial indicators (see par. 1.3). From the findings, it can be inferred that the journey to IRG is still incomplete – there is still progress to be made. This is partly since this study found that IRG has only a significant impact on certain financial indicators. Thus, it remains a challenge (e.g. for prospective investors) to ascertain accurately whether IRG sufficiently does impact a company's financial performance, risk and growth positively.

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