Returns on initial public offerings (IPOs) on the Johannesburg Securities Exchange (JSE): Success and failure patterns

By

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ABSTRACT

Initial Public Offerings (IPOs) offer a fresh source of capital that is vital to the growth of the company and provides the company and existing shareholders a liquid market for their shares. An IPO renders investors an opportunity to share in the rewards of the growth of the company. However, empirical evidence indicates that IPOs have a high level of initial underpricing and poor long run performance. The high rate of initial underpricing is detrimental to both the company and existing shareholders since they are not able to attract the much needed capital to either finance their investment projects or to harvest as a means to get out of the business and ideally reap the value (cash flow) from their investment. Also, the long run underperformance of IPO shares hurts the investors, since they do not get an opportunity to earn superior long run returns from their investments. The high rate of initial underpricing and long run underperformance have been accompanied by high failure rates and low success rates of IPOs all around the world. This has resulted in IPO companies earning very poor long run returns, and has led to a loss of confidence from investors and cast a pall on the IPO market.

Investors typically have very little information about the companies going public and their behavior in early trading is conditioned by basic information. Because of uncertainty about the value of the company, asymmetric information exists between informed and uninformed investors. This as a result has placed investors in a challenging position, where they find it difficult to get sufficient information that can enable them make informed decisions. Consequently, most uninformed investors end up with a bulk of the least desirable shares, yielding poor long run returns (Asma, 2010:9). Thus, in order for investors to maximise their returns, there is a need to critically improve the IPO selection process. In improving the IPO selection process, several factors and characteristics have been identified to be key determinants for predicting IPO returns, and IPO success and failure, although with contradicting results. Therefore, to encourage stock market investment on the JSE, there is need to critically find out which IPO characteristics can be used to predict IPO returns on the JSE and differentiate between successful and failed IPO companies.

The primary objective of this study was to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO

companies on the JSE. The argument of this study was that there are some IPO characteristics which have been identified to be key determinants for predicting IPO returns, and IPO success and failure. A total of 313 IPO companies listed on the JSE from 1996-2007 were used in this study. Secondary data was obtained from McGregor-BFA database. The statistical analysis used included descriptive statistics, frequencies, cross-tabulation, chi-square, ANOVA, t-test, principal component factor analysis (PCA), correlation analysis, multiple regression analysis and Structural Equation Modeling (SEM).

The research findings showed that;

- IPOs on the JSE are underpriced with average market-adjusted returns of 78.10%, 78.57% and 82.81% for the first day, first week and first month.
- IPOs on the JSE underperform the market over a three years period using the market model (-65.59% and -59.77%, for BHAR and CAR respectively); the CAPM model (-61.70% and -58.47%, for BHAR and CAR respectively) and the Fama and French three factor model (-48.53% and-24.46%, for BHAR and CAR respectively).
- IPOs on the JSE underperform the market over a five years period using the market model (-64.37% and -7.77%, for BHAR and CAR respectively); the CAPM model (-65.86% and -7.63%, for BHAR and CAR respectively) and the Fama and French three factor model (-160.66% and-51.94%, for BHAR and CAR respectively).
- IPOs on the JSE outperform the market over a ten years period using the CAPM model (4.62% and 130.33%, for BHAR and CAR respectively). When using the CAR, IPOs on the JSE outperform the market when using the Fama and French three factor model (26.06%) and market model (116.23%).
- The results on the paired sample t-test showed that the market model and CAPM produced similar trends with similar results. However, the Fama and French results were significantly different from the CAPM and the market model for both BHAR and CAR.
- The results on success and failure patterns revealed that there were more survival (60.65%) and failed (20.97%) IPO companies on the JSE than acquired (8.06%) and success (10.32%) companies.

In identifying which IPO characteristics can predict long run returns and IPO success and failure patterns on the JSE, the result showed that;

- The market to book value has a significant negative relationship with absolute and relative long run returns, but has a significant positive relationship with IPO success and failure patterns.

- Market periods (hot and cold) have a significant negative relationship with absolute and relative long run returns and grouped absolute and relative long run returns, and IPO success and failure patterns.

- Initial share price movement has a significant positive relationship with grouped relative returns.

- The company's age has a significant positive relationship with grouped absolute and relative returns, and IPO success and failure patterns.

- Gross proceeds have a significant positive relationship with grouped absolute and relative returns, and IPO success and failure patterns.

- Current ratio has a significant negative relationship with absolute and relative long run returns.

- Net profit margin has a significant positive relationship with grouped absolute and grouped relative returns, and IPO success and failure patterns.

- Operating profit margin has a significant negative relationship with absolute and relative long run returns.

Based on the empirical findings, this study recommends that investors should buy the new issues at the offer price and sell them at the end of the first day of trading. Also, investors who consider a one year holding period should buy the shares at the offer price and sell by the end of the first year. With regards to the long term profits, investors are advised to stay out of the stock market within the first three years but come in during the fourth year and buy mainly portfolios comprising of companies that have been trading for at least four years. Furthermore, investors are advice to change their investment strategy to a ten year holding period, rather than the prevalent three or five year period. Moreover, investors should consider the IPO characteristics identified when predicating a company's likelihood of success or failure in the JSE and also when making an investment decision, as these factors can act as an investor's guide for improving the IPO selection process.

DECLARATION

I, the undersigned, Brownhilder Ngek, Neneh hereby declare that the thesis "*Returns on initial public offerings (IPOs) on the Johannesburg Securities Exchange (JSE): Success and failure patterns*" is a product of my own work and efforts. All sources or quotations used in this research have been acknowledged by means of complete references.

Signature

Date

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GLOSSARY OF TERMS AND ABBREVIATIONS

IPOs:	Initial Public Offering
JSE:	Johannesburg Securities Exchange
AltX:	JSE Alternative Board
SEC:	Security Commission Exchange
SEO:	Seasonal Equity Offerings
MAAR:	Market-adjusted abnormal return
CAR:	Cumulated abnormal returns
BHAR:	Buy and hold abnormal returns
CAPM:	Capital asset pricing model
PCA:	Principal Component Analysis
ROA:	Return on asset
ROE:	Return on equity
SEM:	Structural Equation Modeling
SPSS:	Statistical Package of Sciences
WR :	Wealth relative index
SENS:	Johannesburg Stock Exchange News Service
B/MV:	Book to market ratios
S/L:	Small Low
S/M:	Small Medium
S/H:	Small High
B/L:	Big Low
B/M:	Big Medium
B/H:	Big High
SMB:	Small Minus Big
HML:	High Minus Low
LSE:	London Stock Exchange
EBITDA:	Earnings before interest, taxes, depreciation and amortization
EPS:	Earnings per share

M/B:	Market to book value
P/E:	Price to earnings ratio
GP:	Gross Proceeds
MP:	Market Periods
CR:	Current Ratio
QR:	Quick Ratio
TAT:	Total Asset Turnover
OP:	Operating Profit Margin
NP:	Net Profit Margin

CHAPTER ONE

INTRODUCTION TO THE STUDY

"Many commentators have portrayed the tech boom of the late 1990s as an era of unprecedented deterioration in the quality of firms undertaking initial public offerings (IPOs). But as far back as the early 1980s, firms seeking to go public were displaying signs of financial weakness, and the failure rate of issuers was on the rise. An analysis of the likelihood of failure among IPO firms in 1980-2000 suggests that pre-issue profitability is a good predictor of aftermarket survival" (Peristiani & Hong, 2004).

1.1.   INTRODUCTION

This chapter provides an orientation of the study's research theme, which is undertaken to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the Johannesburg Securities Exchange (JSE). The chapter presents a broad overview for selecting the study. Specifically, the following areas will be examined: the background to the study, the rational for the study and problem statement, the research objectives, the contribution of the study and the limitations of the study. This chapter will, in addition, describe the research methodology, and provide a layout on how the chapters will be structured.

1.2.   BACKGROUND OF THE STUDY

All over the world, new ventures are created with the intent to grow into mature companies. In the growth process, most companies finance their growth through start-up loans, owners' equity, venture capital, and bond issuance. As the need to finance this growth increases, some companies decide to attract more capital to continue the growth process, and an Initial Public Offering (IPO) might be the best way of acquiring this needed capital. An IPO is when a private company chooses to go public by selling its shares in the stock market for the first time (Amadeo, 2012). The transition from being a private company to a public company is one of the most important events in the life of a company (Latham & Braun, 2010:670). Brealey and Myers (2003:15) define an IPO as the original sale of a company's shares to the public for the first time in the primary market. Phillips (2012) views an IPO as an exit strategy for entrepreneurs and venture capitalists where they liquidate some of their equity holdings in their private company in order to raise external financing for new investment in

the company. An IPO is a traditional method of making the transition from a private to a publicly-traded company in order to obtain a listing on the stock exchange (Phillips, 2012).

IPOs are associated with some interesting empirical patterns. Two of the most important anomalies of the IPO market are the high positive initial returns (underpricing) and the long run underperformance. These abnormalities have been acknowledged in most financial markets around the world (Jenkinson & Ljungqvist, 1996:4) and the degree of occurrence varies across different markets. Many studies have been carried out around the world on IPO underpricing and long run performance (Loughran, Ritter & Rydqvist, 2010:1-2; Ritter & Welch, 2002:1795; Goergen, Khurshed & Mudambi, 2007). Heeley, Matusik, and Neelam (2006:2) highlight that underpricing occurs when the closing price at the end of the first day of trading is higher than the initial offer price, meaning that the value at which the company sold its shares to the public was lower than their actual market value. Khurshed and Mudambi (1999:3) and Santos (2011:1) state that one of the most explored abnormalities in finance is why IPOs provide significant abnormal returns on the first days of trading. Underpricing is one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity in underpricing across markets and regions. Moreover, Lijun (2006:7) observed that the extent of underpricing is greatly cyclical with some periods lasting many months at a time, in which case the average initial return is much higher.

However, what seems as a contradiction to these initial high abnormal return (underpricing), is the performance of IPOs in the long run which has been established to earn substantial negative abnormal returns (Bessler & Thies 2007:420; Ritter & Welch, 2002: 1795; Cai, Liu & Mase 2008:420; Govindaamy, 2010:1). Liu (2009:76) defines the long run underperformance of IPOs as the negative average return over a long period of time after the issue. Yuhong (2010) asserts that long run underperformance means that "relative to other companies, investors appear to lose out by continuing to hold the shares of companies that have recently gone public". Various studies (Santos, 2011:1; Drobetz, Kammerman & Wälchli, 2005:261; Govindaamy, 2010:1; Gounopoulos, Nounis & Stylianides, 2008:16) have provided evidence that IPO companies tend to underperform in a three to five year period subsequent to the IPO. This poor long run performance has been observed in many stock markets around the world, ranging in magnitude across the different markets (Govindasamy, 2010:1; Karlsson & Sköld, 2006:4). Thus, the issue of underpricing and long

run underperformance of IPOs seem to be relevant to most countries, regardless of the time period investigated.

In understanding the issue of underpricing and long run underperformance of IPOs, Loughran, Ritter and Rydqvist (1995:1) and Khurshed and Mudambi (1999:6) reckon that there are different explanations to these phenomena, and they vary across different stock markets. Prior studies (Doeswij, Hemmes & Venekamp, 2006; Rajan & Servaes, 2002:20; Hansen & Jørgensen, 2010:4-7; Seitibraimov, 2012:6; Ibbotson & Jaffe, 1975) dealing with IPO underpricing have identified a number of theories to explain these abnormalities such as information asymmetry, price stabilizing activity, bandwagon effects, the investment bubble, risk aversion on the part of underwriters and the winner's curse. Ritter and Welch (2002:1799) point out that the long run underperformance of IPOs could be the result of optimistic expectations; thus more IPOs following successful IPOs. Álvarez and González (2005:19) stressed that the "fads" explanation predicted a negative relationship between long-run returns and initial returns. Brav, Michaely, Roberts and Zarutskie (2009:2) suggested that initial returns might be significantly correlated with future IPO volume. They also affirm that higher initial returns could be an indicator that market conditions were better than expected, which led to more companies taking advantage of this "window of opportunity" and going public in the near future. In spite of these possible explanations for the anomalies of the IPO market, some investors still turn to make the same mistakes time and again.

Generally, one basic assumption of portfolio theory is that investors always want to maximise the returns from their investments for a given level of risk (Manolakis, 2012:6). The motto of every investor is to earn maximum returns on their investment, both in absolute and relative terms (Asma, 2010:8). Return to an IPO investor, which is the difference between the offer price and the aftermarket price, is reflected in part by the risk premiums for investing in uncertain growth opportunities (Chung, Li & Yu, 2005). According to Guo (2001:2), modern finance theories suggest that risk-adverse investors expect a positive compensation for any extra risk they bear in the stock market. Asma (2010:8) points out that the goal of every investor is to maximise their expected returns which is subject to their assessment and capacity to take risk. As such investors view a successful IPO as when the shares of an IPO, three to five years after the initial offering, outperform the stock exchange or major regional index (Ernest & Young, 2008:3). Bach, Judge and Dean (2008:508) view IPO success as the

creation of market value above and beyond the resources invested in the venture since its inception.

Manolakis (2012:5) argues that one of the "major advances in the investment field has been the recognition that the creation of an optimum investment portfolio is not simply a matter of combining a number of unique individual securities that have desirable risk to return characteristics". Investors generally make decisions as to which portfolios they should hold when going public in order to maximize their return on investment. In doing so, they are usually faced with the problem of information asymmetry as they try to select amongst enormous number of shares and portfolios. Investors typically have very little information about the companies going public and their behaviour in early trading is conditioned by basic information. Because of uncertainty about the value of the company, asymmetric information exists between informed and uninformed investors (Lebedeva, 2010:2; Sahi & Lee, 2001:2) As a result, this has placed investors in a challenging position, where they find it difficult to get sufficient information that can enable them make informed decisions. Consequently, most uninformed investors end up with a bulk of the least desirable shares, yielding poor long run returns (Asma, 2010:9). Thus, in order for investors to maximize their returns, there is a need to critically improve the IPO selection process. As most researchers have and would agree, it is extremely difficult for investors to initially select successful IPO companies from failed ones.

When considering the trends of IPOs worldwide, it is evident that an IPO market presents both immensely profitable opportunities and tremendous risks. Recent studies (Weber & Willenborg, 2003:682; Fischer & Pollock 2004:463; Certo, Covin, Daily & Dalton, 2001) document a dramatic decline in the survival and success rates of newly listed companies. Statistics depict that IPO success rates have been in sustained decline for nearly two decades despite the increase in average size and maturity of IPO deals (Weild, 2011:11; Demer & Joos, 2006:2; Fischer & Pollock, 2004:463). The big decline in IPO success around the world has also been accompanied by high IPO failure rates. Various studies (Weber & Willenborg, 2003:682; Fischer & Pollock 2004:463; Certo *et al.*, 2001) on IPO failures suggest that a company that has undertaken an IPO faces major risk of failure, at least in the short run. Burhop and Chambers (2010:10) view IPO failure as a liquidation, wherein shareholders receive little or no return on their investment due to the poor quality of the IPO. Hence, assessing the failure rate of IPOs in a given market is of critical importance to investors,

especially looking at the dramatically increased failure rates of IPOs over time (Demer & Joos, 2006:2).

Therefore, given the apparent anomalies of the IPO market as presented above, it becomes evident that the IPO environment is not efficient. This is because it does not follow the tenet of an efficient market, which Fama (1970: 384) defines as a market in which prices always 'fully reflect' available information. This inefficiency of the IPO market can be attributed to the fact that not all the relevant information is usually available to all participants in the IPO process at the same time. Likewise, prices often do not always respond immediately to the information available. Consequently, because of this information asymmetry and moral hazard, investors find it difficult to get sufficient information to enable them make informed decisions, unlike in the case of established listed companies. Consequently, investors regard the IPO market as a risky investment, since they do not get their long run expected returns for the associated risks. Therefore, to encourage stock market investment on the JSE, there is need to critically find ways of improving the selection process of IPOs so as to enable investors to differentiate between potentially successful and failed IPO companies.

1.3. RATIONALE FOR THE STUDY AND PROBLEM STATEMENT

An IPO offers a fresh source of capital that is vital to the growth of the company and provides the company and existing shareholders a liquid market for their shares. From an investor's perspective, an IPO renders investors an opportunity to share in the rewards of the growth of the company (Foerster, 2003:45). However, there is empirical evidence that IPOs have a high level of initial underpricing as well as long run underperformance. The high rate of initial underpricing is detrimental to both the company and existing shareholders. This is because, they are not able to attract the amount or level of capital needed to either finance their investment projects or to harvest as means to get out of the business and ideally reap the value (cash flow) from their investment. In addition, the long run underperformance of IPO shares hurt the investors since they do not get an opportunity to earn superior long run returns from their investments. The high rate of initial underpricing and long run underperformance is often accompanied by high failure rates and low success rates of IPOs all around the world. The high IPO failure rate has made the IPO market unattractive for companies wishing to go public and this has resulted in a large decline in IPO volumes in stock markets (Gao, Ritter & Zhu, 2012: 22). Consequently, this has led to a loss of confidence from investors and has casted a pall on the IPO market (Schmerken, 2012).

While poor long run underperformance has been documented across different stock markets, there has also been evidence of a good number of success stories (Bessler & Thies, 2007:420). For example IPO companies such as Google, RedHat, Groupon, Kraft, EBay; Talecris and Yahoo (Pencek, Hikmet & Lin, 2009:1) have attracted significant interest from investors and researchers in the marketplace, and this is due to the significant gains associated with these high-profile IPOs. This goes to show that not all IPO companies have poor long run returns. Nevertheless, collectively IPOs have historically been found to have poor long run returns which negatively affect investors. This is so considering that investors do not get superior returns from their risk-return trade-off. As a result, they end up with poor long run returns because they initially selected the wrong IPO companies. This continues to be a critical concern for investors, especially as they find it extremely difficult to select successful IPOs from failed ones. Ultimately, they regard the IPO market as an unattractive and risky investment, which contributes to the high level of initial underpricing to attract new investors.

In improving the IPO selection process, several factors and characteristics have been identified to be key determinants for predicting IPO returns, and IPO success and failure, although with contradicting results. IPO characteristics, such as the company's age, timing of the issue (hot and cold market periods), issue price, profitability, market capitalisation, offer size, gross proceeds, leverage, price to book value (P/B), market to book value (M/B), financial and non-financial ratios, pre-IPO performance and technical riskiness seem to be potentially significant determinants of IPO short and long run returns as well as factors impacting on the success and failure of IPOs (Hughes & Lee, 2006: 5, Sohail & Raheman, 2009:63; Sahoo & Rajib, 2010:27; Durukan, 2002; Demer & Joos, 2006:17; Carpentier & Suret, 2007:2). Ernest and Young (2012a:1) pointed out that investors base 60% of their IPO investment decisions on financial factors such as debt to equity ratios, earnings per share (EPS) growth, sales growth, return on equity (ROE), profitability and earnings before interest, taxes, depreciation and amortization (EBITDA) growth. Also, investor based 40% on non-financial factors such as brand strength, corporate strategy and execution, operational effectiveness, quality of management, and corporate governance. Although these different factors have been established to vary significantly across different stock markets, investors are still unable to initially differentiate successful companies from failed ones.

Hence, in such an environment of sensitive scrutiny and on-going market uncertainties, which is frequently characterised by information asymmetry, and high levels of initial underpricing and long run underperformance; it becomes extremely difficult for investors to select successful IPO companies from failed ones. Also, the high failure rates – coupled with low success rates and decline in volumes associated with IPOs, result in investors being more critically concerned than ever about the returns on their investments. In addition, given that the poor long run returns of IPOs only happen to some IPO companies, while the other IPO companies show positive long run returns, it becomes critical to find out which IPO characteristics can be used to predict IPO returns on the JSE and differentiate between successful and failed IPO companies.

1.4. PRIMARY OBJECTIVE

The primary objective of this study is to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the JSE.

1.4.1. SECONDARY OBJECTIVES

- ➢ To review the literature on IPOs and the decision to go public.
- ➢ To review theoretical concepts on IPO underpricing and IPO long run performance.
- ➢ To examine existing literature on IPO success and failures in various stock markets in both developed and developing countries.
- ➢ To review the literature on the determinants of IPO returns and IPO success and failure.
- ➢ To appraise the level of initial underpricing on the JSE.
- ➢ To appraise the three years, five years and ten years long run performance of IPOs on the JSE.
- ➢ To investigate empirically if the differences in long run performance result from the choices of methodology (different techniques and formulas to measure return).
- ➢ To determine whether market related characteristics (P/E and M/B) can be used to predict long run returns, and the success and failure of IPOs on the JSE.
- ➢ To examine whether the issue related characteristics (hot and cold markets periods, and initial share price movements) can be used to predict long run returns, and the success and failure of IPOs on the JSE.

> ➢ To determine whether firm specific characteristics (gross proceeds, company's age and industry) can be used to predict long run returns, and the success and failure of IPOs on the JSE.
>
> ➢ To determine whether pre-financial ratios can be used to predict long run returns, and the success and failure of IPOs on the JSE.

1.5. CONTRIBUTIONS OF THE STUDY

According to Brau, Ryan and DeGraw (2006), the IPO route is an increasingly popular mechanism of raising capital and funding growth. This study makes a contribution to the body of knowledge on IPOs in several ways:

Firstly, underpricing is one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity in underpricing across markets and regions. This study aims at determining the level of IPO underpricing on the JSE over a period of 1996 to 2007. Also, this study will determine if the level of underpricing has been consistent over the period under investigation and examine the relationship between IPO underpricing versus market periods (hot and cold market) and sectorial distribution. To date, no published study on the JSE covering the post-apartheid era has examined the IPO underpricing covering a period of over ten years, which provides a justification for study.

Secondly, there has been extensive evidence that IPOs tend to underperform the market in a three to five year period subsequent to the listings (Govindasamy, 2010:1; Karlsson & Sköld, 2006:4; Santos 2011:7). Given that studies on the JSE have calculated the long run performance of IPOs over a three years, five years or ten years period, this study will appraise the three years, five years and ten years long run performance of IPOs on the JSE to find out if the performances of IPOs on the JSE differ from international evidence.

Moreover, there has been a great discrepancy on how long run performance is calculated. Alvarez and Gonzalez (2001) asserted that long run performance of IPOs depended on the methodology used and these models are subject to limitations. Given that studies on the JSE have calculated the long run performance using either the market model, capital asset pricing model (CAPM) model, and Fama and French model, this study aims to calculate the long run

performance of IPOs using all of these models for a three year, five year and ten year period to find out if the differences in long run performance result from the choices of methodology. Furthermore, there is a wealth of evidence (Loughran & Ritter, 1995:23; Govindasamy, 2010:42; Bessler & Thies, 2007) indicating that IPOs earn very poor long run returns. However, there are some IPO companies who earn very high positive returns in the long run (Jotwan & Singh, 2011:58; Wang, 2011:10). This study will add to existing knowledge on IPOs on the JSE by finding out which IPO characteristics can be used to predict IPO long run returns on the JSE over a five year period.

In addition, there has been significant evidence documenting a big decline in IPO success around the world, which has also been accompanied by high IPO failure rates (Weild, 2011:11; Demer & Joos, 2006:2; Fischer & Pollock, 2004:463). The issue of IPO success and failure is very vital to the different stakeholder groups involved in IPOs. While new company managers have an interest in company's success as their careers and the value of their firm-specific human capital depends on the success of their company; investors are concerned about the value of their investment. Policy makers on their part are keen to know whether the regulations and rules in place are effective and sufficient to protect investors and the reputation of the market. From the above discussed, this study aims to differentiate between successful and failed IPOs on the JSE, and to find out which IPO characteristics can be used to predict success and failure patterns of IPOs on the JSE over a five year period. The factors identified will act as guide for potential and existing investors to consider when selecting their portfolios.

Furthermore, this study will also make an academic contribution to the extensive and on-going research gathering on reliable and accurate information on IPOs in South Africa. Since IPO behaviour has been seen to vary across different stock markets, the study will identify those unique features that are pertinent to the South African IPO market, in a bid to add to the current knowledge on IPO studies in South Africa. More so, the unique features that will be identified from the IPOs on the JSE could act as the bases for new research in other stock markets.

1.6. RESEARCH METHODOLOGY

This study employed a research methodology that encompasses a comprehensive review of existing IPO literature. This literature is supported by empirical evidence from IPOs on the

JSE and other stock markets. The constructs for empirical testing as used in this study, are developed from a solid background of finance literature on IPOs and capital markets. The research methodology adopted is also structured into two phases: literature review and empirical study.

1.6.1. Phase one: Literature Review

To support the establishment of robust research, this study engaged a review of previous literature to build a resourceful judgment in the examination of IPO returns, and the success and failures patterns of IPOs listed on the JSE. The review of literature also served as a standardized approach to improve the body of knowledge, and establishes the desired evidences to support contemporary research. The researcher further divided the literature studies into four chapters, wherein: the first chapter focused on the general overview IPOs and the decision to go public; the second chapter focused on IPO returns (underpricing and long run performance); the third examined the theories and concepts on IPO success and failure; and the last chapter (four) looked at the determinants of IPO returns and IPO success and failure. Furthermore, various verifiable secondary sources such as international and local peer-reviewed journals and conference proceedings, finance books, working papers, unpublished dissertations, internet sources and other research materials obtained from the digital and hard copy library of the University of the Free State were used to gather the necessary material for the literature studies.

1.6.2. Phase two: Empirical Study

The empirical study was approached from the viewpoint of a valid research design and the method of data collection, which included a population and sample size, the measurement technique, and the method of data analysis.

1.6.2.1. Data Collection

The study utilized a combination of secondary data that was obtained from information on IPO listings on the JSE from 1996 to 2007. This secondary information was obtained from sources such as:

➢ McGregor-BFA database where the annual financial reports, financial statements, offering price, and daily share prices (open and closing) from the first trading day of

IPO companies were collected. Also the corresponding daily market prices (JSE all share index) were also obtained from McGregor-BFA database.

➢ The JSE yearly handbook.

➢ The IPO prospectus.

➢ International magazines, books, Academic Search Premier, Business Source Premier, Ebscohost and Emerald.

➢ JSE Stock Exchange News Service (SENS) and Fin 24 Expert.

1.6.2.2. Population and Sample Size

The population sample for this study comprised of all the listed IPOs on the JSE from 1996 to 2007. A total of 313 IPO companies over a period of 1996-2007 were used in this study. The end date of 2007 was chosen so that share price movements within the first 60 months after the listing date could be examined. The choice of the start date was based on the fact that it was from 1996 that the JSE All Share Index (ALSI) was introduced which was used as the broad benchmark to assess the abnormal returns from these listings. The sample included both listed and delisted companies.

1.6.2.3. Measurement Techniques

This section focuses on the measurement techniques used in calculating IPO underpricing, IPO long run performance, IPO characteristics, IPO returns and IPO success and failure. The formulas for these techniques are presented in Table 1.1.

Table 1.1 Summary of the measurement techniques used in this study

Meaurement techniques	Formula	sources
IPO underpricing		
Market-adjusted abnormal return (MAAR)	$$MAAR_{x,i} = 100 \times \left\{ \frac{(1 + R_{x,i})}{(1 + R_{m,i})} - 1 \right\}$$	Aggarwal Leal and Hernandez, (1993)
Long run performance		
Buy and hold abnormal returns (BHARs	$$BHAR_i = \frac{1}{N} \sum_{t=1}^{N} \left[\left(\prod_{t=1}^{T}(1 + R_{i,t}) \right) - \left(\prod_{t=1}^{T}(1 + R_{m,t}) \right) \right]$$	Suherman and Buchdadi (2010:9)

Cumulated abnormal returns (CAR)	$$CAR_t = \sum_{s=1}^{t} AR_s$$	Suherman and Buchdadi (2010:9)
Capital asset pricing model (CAPM)	$$E(R_i) = R_f + \beta_i [\![E(R_m) - R_F]\!]$$	Amsa (2010:18)
Fama and French three factor model	$$R_{it} - R_f = \alpha_t + \beta_{im}(R_{mt} - R_f) + \beta_{is}(SMB_t) + \beta_{ih}(HML_t) + \varepsilon_t$$	Mangozhe (2010:14)
IPO long run returns		
Absolute return	$$BHR_{i,T} = \left[\prod_{t=1}^{\min[T,delist]} (1 + R_{i,t}) \right] - 1$$	Ritter (1991)
Relative return	$$BHAR_i = \frac{1}{N} \sum_{t=1}^{N} \left[\left(\prod_{t=1}^{\min[T,delist]} (1 + R_{i,t}) \right) - \left(\prod_{t=1}^{min[T,delist]} (1 + R_{m,t}) \right) \right]$$	Ritter (1991)
IPO success		
Wealth relative index (WR)	$$WR = \frac{1 + average\ 5\ years\ total\ return\ on\ IPO}{1 + average\ total\ return\ on\ benchmark\ firm}$$	Wilbon (2003:238); Ritter (1991:8)
IPO failure		
Delisted companies resulting from bankruptcy and liquidation within five years subsequent to their listings were obtained from McGregor database		McGregor-BFA

1.6.2.4. Data Analysis

All statistical analyses in the study were performed using Microsoft Excel and Statistical Package of Sciences (SPSS). Data was interpreted using descriptive statistical tools like

percentages, frequency distribution tables, histograms and charts. Furthermore, inferential statistics, such as cross-tabulation, chi-square, one-way analysis of variance (ANOVA), t-test, correlation analysis, multiple regression analysis, principal component factor analysis (PCA), and Structural Equation Modelling (SEM) were also used for analytical purposes.

1.7. LIMITATION OF THE STUDY

The JSE All share index was used as the only benchmark as opposed to using other benchmarks such as the market capitalisation and book to market portfolio benchmarks. Also, a five year period was used to predict IPO long run returns and IPO success and failure patterns on the JSE. This study did not consider if these factors could also predict IPO returns in other time periods such as three years or ten years. Moreover, the firm specific characteristics, issue related characteristics, market related characteristics and selected financial ratios were used to predict IPO returns and IPO success and failure patterns. However, the macro-economic factors were not considered in this study.

1.8. CHAPTER OUTLINE

- Chapter One: this chapter introduces the background to the study; the problem statement and the research objectives. In addition, the chapter discusses the research contributions of the study, the research methodology and the conclusion to the chapter.
- Chapter Two: this chapter discusses the stock market and its role in the IPO process. Also, this chapter discusses the decisions to go public – that is, the going public versus the staying private dilemma, wherein the benefit and costs of going public will be examined in-depth. In addition, the role players in the IPO process, the JSE and its procedures for listing are discussed in detail in this chapter.
- Chapter Three: in this chapter, the theories and concepts on IPO initial returns (underpricing) and long run returns (long run underperformance) are explored.
- Chapter Four: this chapter examines theories and concepts on IPO success and failures. In this chapter various models for predicting and measuring IPO success and failure are discussed.
- Chapter Five: this chapter examines the determinants of IPO returns and IPO success and failure.
- Chapter Six: the main concentration of this chapter is on the methodology used in conducting the empirical study. The chapter examines the research design; the sampling

technique; the data collection methods, the measurement techniques and the methods for data analyses.

- Chapter Seven: this chapter presents the research findings and interpretation of research results.

- Chapter Eight: this chapter presents the discussions on the empirical findings, and the conclusion and recommendations. In addition, the chapter presents the limitations of the study, and areas for further research are proposed.

1.9. CHAPTER SUMMARY

This chapter highlighted a broad overview related to this thesis where it was established that IPOs are associated with some interesting empirical patterns. IPO was identified as a platform that offers a fresh source of capital that is vital for the growth of the company and provides the company and existing shareholders a liquid market for their shares. Two of the most important anomalies of the IPO market were identified to include the high positive initial returns (underpricing) and the long run underperformance. Underpricing was viewed as one of the most common phenomena that have been evident in most stock markets around the world, and there is a great deal of disparity in underpricing across markets and regions. Moreover, empirical evidence revealed that IPOs tend to underperform the market in a three to five year period subsequent to the listings. This study observed that the issue of underpricing and long run underperformance of IPOs seemed to be relevant to most countries, regardless of the time period investigated. In addition, the chapter illustrated that there is worldwide evidence documenting a big decline in IPO success around the world. This decline has also been accompanied by high IPO failure rates. The combination of these issues raises the need to conduct this study on the JSE. Given this, the next chapter focuses on exploring and explaining those elements that are peculiar to IPO.

CHAPTER TWO

UNDERSTANDING IPOS: A GENERAL OVERVIEW

"As time goes on, I get more and more convinced that the right method in investments is to put fairly large sums into enterprises which one thinks one knows something about and in management of which one thoroughly believes. It is a mistake to think that one limits one's risks by spreading too much between enterprises about which one knows little and has no special reason for special confidence. One's knowledge and experience is definitely limited and there are seldom more than two or three enterprises at any given time which I personally feel myself entitled to put full confidence" (John Maynard Keynes, From a letter to a business associate, F. C. Scott, on August 15, 1934).

2.1. INTRODUCTION

Initial Public Offerings (IPO) have been the subject of substantial amount of research in finance literature. This chapter provides an overview on IPOs and the decision to go public. An IPO is when a privately owned company chooses to go public by selling its shares in the stock market for the first time (Amadeo, 2012). The decision to go public is one of the most important events in the life of a company (Zheng & Li, 2008:437). Generally, a stock exchange is needed to facilitate the IPO process since it is here that the price of stocks and the value of all publicly owned companies are established. This chapter will make a distinction between a primary market and a secondary market. Also, the benefits of the stock exchange to the issuing company as well as to the investors and the society will be examined.

The central theme of this chapter will describe the history of IPOs as it is important to understand its inception as a means of properly assessing IPO patterns over the years. Moreover, a discussion on the motives for going public, as well as the advantages and disadvantages of going public will also be examined. Previous studies have been conducted to understand and explain why companies decide to go public instead of seeking other alternatives to an IPO when raising capital for their businesses. Amadeo (2012) believes that an IPO is an exciting time for a company since it means it has become successful enough to require much capital to continue to grow and finally a time for its owners to cash in on all their hard work.

The need to get it right when a company goes public is a critical process that demands meticulous preparation since a company has only one opportunity to go public (Draho, 2004). The IPO process is a time-consuming and expensive process and thus, in order to ensure the effective functioning and success of the IPO process, selecting the right participants is very critical. There are several classes of participants involved in the IPO process. This chapter will examine the typical roles of these key participants. In addition, the Johannesburg Securities Exchange (JSE), and the procedures for listing will be discussed in detail. The JSE has functioned as a market place for financial products for more than 125 years for both local and international companies seeking to access the region's capital pools and seeking to raise brand awareness in South Africa and throughout Africa.

2.2. INTRODUCTION TO THE STOCK EXCHANGE AND ITS ROLE IN THE IPO PROCESS.

The stock market is a financial system embedded within the larger economic system of a nation (Lasher, 2010:188). Harmilapi and Kain (2012:1) point out that the stock market is a place where companies get listed to issue their shares and raise funds. The stock market is one of the most significant markets to investors and shareholders since it is here that the price of stocks and the value of all publicly owned companies are established. The stock market is an organised market that provides a place where existing and approved securities can be bought and sold easily, while also ensuring that complete information is made available to the public regarding the prices and volume of transactions taking place every day (Indian Financial Market, 2008:73). Stock market activities can be classified into three distinct types. Firstly, new public offerings by privately held companies in the IPO market (primary market). Secondly, additional shares sold by established publicly owned companies in the primary market (in this case, the company can raise additional capital when its securities are issued to the public). Thirdly, trading outstanding previously issued shares of established publicly trading companies in the secondary market. In this situation, the company receives no new money when the sales are made in the secondary market (Besley & Brigham, 2011:42).

A publicly owned company which is also known as a publicly traded company or a publicly held company is a limited liability company that is owned by many investors, most of whom are not actively involved in the management of the company (Brigham & Houston, 2009:42). Publicly owned companies usually offer their shares either in the form of stocks or bonds for

sales to the general public, either through a stock exchange, or through a market maker operating in an over-the-counter market. Public companies can either be unlisted or listed on a stock exchange depending on their size and local legislation. Public companies can also raise capital through sales in either the primary or secondary markets. A listed company is one whose securities are quoted and traded on an exchange, while an unlisted company is one whose shares are not listed on an exchange and its shares are therefore not available for trade to the general public (Norman, 23:2011; Benning, 2007:326).

In contrast, a privately held company, also known as a closely held or an unlisted company, is a company what is owned either by few individuals or a relatively small number of shareholders who are typically associated with the management of the business (Brigham & Houston, 2009:41). Privately held companies do not offer their shares to the general public, but rather trade their shares privately. A privately held company can become a publicly held company by conducting an initial public offering. When shares in a privately held company are offered to the public for the first time, the company is said to be going public and the market for the shares that has gone public is called an IPO. An IPO is when a private company chooses to go public by selling its shares in the stock market for the first time (Amadeo, 2012). Blum (2011:4) also views an IPO as the first sale of shares by a private company to the public and the consequential listing on a stock exchange. The transition from being a private company to a public company is one of the most important events in the life of a company (Latham & Braun, 2010:670). Brealey and Myers (2003:15) define an IPO as "the original sale of a company's securities to the wider public for the first time in the primary market".

The stock markets are divided into the primary and secondary market (Nidhi, Payel & Vinod, 2010:1). Soyede (2005:8) views a primary market as a market for new securities. It is a platform where the companies can raise funds for investment or where already quoted companies can raise fresh capital for expansion. Lasher (2010:185-186) points out that the initial sale of a security takes place in the primary market, while the subsequent sales between investors take place in the secondary market. Corrado and Jordan (2002:20-35) view a primary market as a market where investors purchase newly issued securities. This usually takes place during an IPO where companies offer stock for sale to the public for the first time. A secondary market is the market where investors trade previously issued securities either directly with other investors, indirectly through a broker who negotiates the transactions for

others or directly with a dealer who buys and sells shares. Brighan and Houston (2009:30) consider a primary market as a market in which a business raises capital by issuing new shares, while a secondary market is a market in which shares and other financial assets are traded amongst investors after they have been issued by the business. The main distinction between the primary market and the secondary market is that while the main function of the primary market is to raise long-term capital through fresh issue of shares, the main function of the secondary market is to provide a continuous and ready market for the existing long-term securities (Indian Financial Market, 2008:71). A report by the Lac Debt Group (2006) viewed the secondary market as a natural extension of primary markets and suggested that a well-functioning secondary market inevitably involved a well-structured primary market. Thus, an understanding of how primary and secondary markets function is very imperative, as it will help investors in their investment decision process from buying IPO shares in the primary market to trading these shares for returns in the secondary market.

The functions of a stock exchange are as follows. Firstly, the stock exchange provides liquidity and marketability to existing shares in the market by creating a continuous market place where shares can be bought and sold. Secondly, the efficient functioning of a stock market creates a favourable climate for an active and growing primary market for a new issue, while a healthy and active secondary market creates a positive environment amongst investors. The stock exchange also provides benefits to the company, investors and the society. To companies, the stock exchange ensures that companies whose shares have been listed on a stock exchange enjoy a better goodwill and credit-standing because they are financially sound. To investors, the stock exchange creates a platform for investors to enjoy the convenience of buying and selling shares at will and also provides regular information on prices of securities traded at the stock exchanges. To the society, the stock exchange provides a lucrative avenue for investment and liquidity and thus encourages people to save and invest in long-term securities (Indian- Financial Market, 2008:74-75).

A concluding statement concerning the role of the stock exchange is that it helps companies to raise funds through an IPO, provides liquidity and a long term investments for investors and thus improves the credit worthiness of individual businesses. These factors attest to the central role of the stock exchange in facilitating the IPO process and enabling IPO companies in achieving their numerous motives.

2.3. IPO HISTORY

The concept of IPOs can be traced as far back as 1602, where the Dutch East India Company was the first company in the world to issue stocks and bonds in an initial public offering (Chambers, 2006). The bull market era of the 1960s witnessed a rising popularity of IPOs as an attractive investment instrument. During the 'hot issue market' of 1968 and 1969, Wall Street played host to a total of 2,171 IPOs within a short span of twenty-four months (Neuberger & Hammond, 1974:165). Subsequently, the IPO market saw a down turn at certain points. Firstly, the golden age era (1970-1995) was a period when most companies ensured they built a growing business with a constant profitable track record for at least five quarters before going public. Secondly, the internet bubble (dot-com bubbles) covering roughly 1995–2000 was an era where many investors were willing to overlook traditional metrics such as price per earnings ratio (P/E ratio) in favour of vague promises of future growth and IPOs happened regardless of the history of profitability (Blank, 2011). Thirdly, the Lean Start-ups/Back to Basics (2000-2010) was a period where the equity markets were challenged by concerns about sovereign debt in Europe (double-dip recession) and this affected the IPO pipeline.

The history of the stock market is also full of remarkable events that have earned their own names, such as the "Great Crash" of 1929, the "Tronics Boom" of the early 1960s and the "Go-Go Years" of the late 1960s, the "Nifty Fifty" bubble of the early 1970s, the "Black Monday" crash of October 1987 and the "Dot.com" bubble of the 1990s (Baker & Wurgler, 2007:18), and the global economic crisis of 2008, which saw a knock in the performance of many stock markets around the world. Baker and Wurgler (2007:18) believe that each of these events represent a dramatic level of change in share prices that seems to defy explanations. Nevertheless, despite the negative impacts some of these events had on investor's returns, there has been an increasing interest in going public largely due to the success of multinational companies, such as Google, Groupon, Kraft, EBay; Talecris and Yahoo (Pencek, Hikmet & Lin, 2009:26). Also, two of the biggest IPOs (agricultural bank of China and AIA) in history completed very successfully (Ernest & Young, 2012), which attracted significant interest to investors and researchers in the marketplace due to the significant gains associated with the high-profile IPOs.

Moreover, 2012 brought hope to investors looking for new entrants into the financial markets. The going public of Facebook, which initially seemed to suggest an active and

successful IPO environment was all but guaranteed (FTI Consulting, 2012). The May 18, 2012 Facebook headlines that would have brought investors off the side lines and got them active in the markets again, goes down in history as one of the biggest flops the stock market has ever seen initially (Sutton, 2012). Facebook IPO which reached a $45.00 per share the day of its IPO fell to $38.8 per share by the end of the trading day and subsequently experienced severe drops thereafter. Furthermore, by the second half of 2012, the rising credit crisis in the Eurozone and recession fears in the United States placed a pall on financial markets. As a result, this has led to a loss of confidence from investors and cast a pall on the IPO market (Schmerken, 2012). Figure 2.1 provides historical data on global IPO volumes and capital raised over the period 1996 to 2011.

Figure 2.1: Global IPO activity from 1996 to 2011

Global IPO Activity from 1996 - 2011
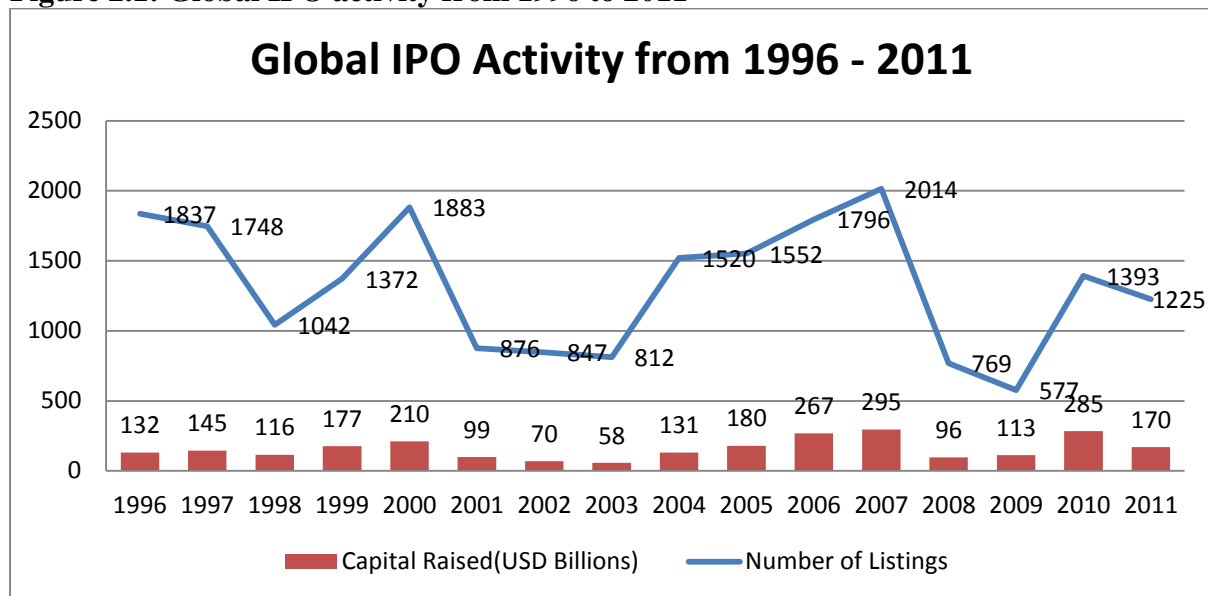
 (Source: Ernst and Young, 2012b:3)

From Figure 2.1 it is observed that the highest number of IPO listings and capitalisation was recorded in 2007 were a total of 2014 companies were listed and a total capital of 295 billion US dollars was raised. The lowest number of IPO listings was in 2009, were a total of 577 companies were listed. A possible explanation to this trend is the global recession which took place between 2008 and 2011, as stock markets all around the world experienced a drop in the number of IPO listings. Another interesting finding is that the number of IPO listings in a period does not guarantee that much capital will be raised. An example is seen in 2003, where 812 companies were listed and only 58 billion US dollars was raised, as oppose to 2008, where 769 companies were listed and 96 billion US dollars was raised. These findings are consistent with other studies by Ibbotson and Jaffe (1975) and Ibbotson, Sindelar and

Ritter (1994) which showed substantial fluctuation in IPO volume but nevertheless failed to examine the underlying cause of this variation. Pagano, Panetta and Zingales (1998) interpreted the fluctuation in IPO volumes as indications that companies time their IPOs to take advantage of industry-wide overvaluations, rather than to finance future growth. Rajan and Servaes (1997, 2003) observed that IPO volumes were related to various forms of market irrationality. Lowry and Schwert (2002:1177) pointed out that IPO volumes tend to be higher following periods of especially high initial returns, and that this trend is driven by information learned during the registration period. Lowry (2003:6) emphasised that level of investor optimism, the adverse-selection costs of issuing equity, and aggregate capital demands were the three factors that contributed to the observed fluctuation in the number of companies going public over time, with capital demands and investor sentiment being the most important. Lowry's (2003) findings also suggested that factors other than financing requirements have a substantial effect on the timing of a company's IPO.

The above literature on the history of IPOs highlighted that there has been substantial fluctuation both in terms of the number of companies going public and the capital raised over time, with several factors (the adverse-selection costs of issuing equity, investors sentiments and capital demands) identified as reasons accounting for these variations. This means that there are important factors or motives explaining why companies chose to go public rather than staying private.

2.4. MOTIVES OF IPO

According to Andersson and Westling (2009:3), there are usually many motives or reasons why companies go public and these motives are often specific to each company. This study divides the motives for going public in to primary and secondary motives.

2.4.1. Primary motives

The primary motives of going public are to obtain financing and or to harvest.

2.4.1.1. Financing

An IPO provides a platform where companies can establish an improved financial structure. Poulsen and Stegemoller (2005:10) propound that companies that consider moving to public status through an IPO do so because they have either moved beyond their optimal amount of debt financing or because their liquidity is insufficient to fund the required fixed debt

payments. An IPO provides an opportunity for alternative sources of equity and debt financing for businesses that are constrained in their ability to raise equity or debt capital.

Pagano, Panetta and Zingales (1998:52) established that Italian companies went public to rebalance their capital structure. Jenkinson (1990:244) highlights that one of the main reasons why companies go public is because they want to raise capital to repay their debt and support their expansion projects. Rungani (2008) stresses that the overall objective of raising finance through IPOs is to avoid exposing the business to excessively high borrowing and ensures that the financial structure of the company is kept at an optimal level. Martinovic (2008) adds that high capital structure (high ratios of debt to equity) is usually unsafe and lacks fiscal stability in the long run. Geddes (2003:28) notes that the most common reason companies raise capital through an IPO is that the capital raised from an IPO does not have to be repaid, whereas debt financing means that the debt must be repaid with interest. Likewise, Machmeier, Kraus and Dunbar (2006:5-6) are of the opinion that companies go public in order to raise significant additional capital which will help improve the company's balance sheet, help funding corporate growth and permit the company to pay off its debt. The advantage of obtaining additional capital through an IPO is that it has no immediate negative impact on cash flows as oppose to debt financing which comes along with its attached stream of interest payments (Loudoffice, 2005:2-3).

Jenkinson and Ljungqvist (1996) emphasise that another reason why companies go public is to obtain working capital and cash flow to expand the company's growth. As the growth potential of an entrepreneurial company increases, the need for cash intensifies. Cash flow is needed to help the company meet its short-term financial obligations. Cash is needed to maintain survival and sustain growth. An IPO is used as one of the many tools to raise capital for a company. IPOs provide access to long-term capital and also enable the investor to meet subsequent capital needs (Timmons & Spinelli, 2008:485). Tsutsumi (2010:10) affirms that obtaining additional financing through an IPO can substantially help to enlarge the company's capital and thus provide the means for future growth. A shortage of cash flow can cause insolvency, which will lead to bankruptcy and possible liquidation. This is evident in studies by Gumede (2002:381) and Song, Padoynitsyna, Vander, Bij, and Halman (2008:17) who established that the availability of working capital is one of the critical success factors for businesses. Timmons and Spinelli (2008:7) place emphasis on the fact that although IPOs

are best suited for young and fast growing companies with ample future growth prospects, companies opting for an IPO should also be able to demonstrate stable earnings.

2.4.1.2. Harvesting

According to Mason, (2006:536), King (2002) defines harvesting as the "path to realizing the gains from an investment." Tajnikar, Bonˇca and Zajec (2007:536) assert that harvesting can be considered as an activity in which investors pull their profit from their investments with the intention of either extracting the company's free cash flows over time or reinvesting its profits in to other potential investments. Harvesting is an event whereby entrepreneurs and management sell at least a portion of their shares to the public or a corporate buyer. Harvesting provides managers with equity stakes to have a "liquidity event" for their shares. Smith and Smith (2000:566) state that harvesting is an element of the entrepreneurial investment process. Timmons and Spinelli (2004:608) viewed harvesting as when "the seeds of renewal and reinvestment are sown". This implies that harvesting can be considered as an activity of reinitiating the entrepreneurial process and as the "recycling of entrepreneurial talent and capital". Kensinger, Martin and Petty (2000:84) see harvesting as a strategy used by business founders and investors whose aim is to gain liquidity from their investments, in order to help the business grow. Tajnikar, Bonˇca and Zajec (2007:536) further add that it is through harvesting that investors can obtain the resources needed for growth and that investors may also decide to harvest because they believe the company is at the best potential for harvesting. Moore, Petty and Longenecker (2008:281) established that entrepreneurs and investors use harvesting as means to get out of the business and ideally reap the value of their investment, and reduce risk while also creating future options. Martinez and Perron (2004:14) are of the opinion that businesses go public in order to obtain liquidity for management and existing shareholders, which is often viewed as an exit strategy for existing owners. An IPO creates a market in which insiders can obtain a return on their original investment and diversify their holdings. Moore *et al.,* (2010) point out that the advantage of harvesting is that it helps entrepreneurs and managers retain control of their company while harvesting their investments. Harvesting also helps the business to avoid incurring expenses associated with the sale of the business.

Tajnikar, *et al*. (2007:536) elucidate that in order to reap the rewards of the investment process; a successful harvesting strategy has to be a carefully planned activity. It entails defining a clear harvesting strategy which is a strategic plan on how investors will realise

their return on investment. Spinelli and Adams (2012:561-562) accentuate that shaping a harvesting strategy is an enormously complicated and difficult task; thus business founders and investors need to exercise patience, have realistic valuations and outside advice when planning to harvest the returns from their investments. Timmons (1999) reckons that it also requires the investors' understanding and ability to take advantage of a so called strategic window, which is the time when the most suitable circumstances emerge for the actual harvest to be realised. Tajnikar, *et al.* (2007:551) note that the choice of an IPO as a form of harvesting significantly relates to a company's future and as a result, when considering an IPO as an attractive option, it is imperative that the company shows possible growth potential in the future - either through an expansion of the business in the existing market, or its movement into a related market.

2.4.2. Secondary Motives

Companies may also choose to go public because of non-financial reasons, such as increase publicity and awareness about the company and to attract talent (Ritter & Welch 2002:5).

2.4.2.1. Public Relation Tool

Tsutsumi (2010:10) believes that businesses go public in order to get public attention and thus increase the public's knowledge of the company's existence. According to Rasheed, Datta and Chinta (1997:11), businesses go public in order to gain company recognition, while also ensuring that they attract qualified management by initiating stock-compensation plans. Evans (2006) elucidates that as companies print out their company information when going public; they generate increased attention in the business press and thus increase public awareness which may lead to new opportunities and new customers. This increased public awareness further enhances a company's credibility with its suppliers, customers, and lenders, and thus improve its credit terms. Evans (2006) is also of the opinion that customers securing long-term relationships usually want to do business with a company that has a highly regarded and trustworthy reputation and usually go for public companies because they believe these public companies will act as a long-term provider of products and services. Maksimovic and Pichler (2001:485) assert that firms conduct IPOs to increase the publicity and reputation of their company.

2.4.2.2. Talent attraction

Studies by (Martinez & Perron, 2004: 15-17; Tsutsumi, 2010:10) elucidate that publicly traded companies use stocks as equity compensation to help attract, reward and retain key personnel in their businesses. A study by the U.S. Equities (2012) highlight that the resultant effect of stock-based compensation incentives programs is that it increases productivity and loyalty to the company, while also acting as a key selling mechanism when attracting top talent without incurring additional cash expenses. McCracken (2011) emphasises that when companies trade in an open market, they increase their liquidity which thus makes it possible for them to attract highly qualified human talents.

The above literature on the motives for going public highlighted that there are primary motives (financing and harvesting) and secondary motives (public relation tool and talent attraction) for going public and these motives are often specific to each company. It was established that the primary motives for going public provides an opportunity for alternative sources of equity and debt financing for businesses that are constrained in their ability to raise equity or debt capital, and finally a time for its owner's time to cash in on all their hard work. The secondary motives enabled businesses to increase the public's knowledge of the company's existence and in the process of getting public attention, attract highly qualified human talents. While all of these motives are important, the main goal for every company going public is however to raise capital. Nonetheless, before going public, a company needs to consider its advantages and disadvantages before making a decision.

2.5. ADVANTAGES AND DISADVANTAGES OF IPO

When a company is considering going public, companies must take into consideration the advantage and disadvantage of going public. While there are a lot of benefits related to going public, these benefits have a cost associated with them.

2.5.1. Advantages of going public

There are many advantages of going public. This study will only focus on the advantages to the company.

2.5.1.1. To raise capital for current and future projects

Chanin (2010:1) states that the main advantage of going public is the ability to raise funds for working capital and other project in the public market. A business needs capital to invest in profitable projects and they may not always have enough capital themselves, in which case they will have to raise the capital externally. An IPO provides an ideal opportunity to increase a company's financing options. A public company can raise capital with greater ease because of the confidence instilled in the investors. The money raised can be used for growth and expansion, corporate marketing and development, retiring existing debt, acquisition of capital and corporate diversity (Rankin, 2008). Also, unlike private companies which use equity or debt to finance their business, for which interest has to be paid on it, the capital raised from the public does not need to be repaid.

2.5.1.2. Liquidity

Bian, Su and Wang (2010) define liquidity as the ability to convert an asset into cash without losing the value of the asset. Unlike private companies that have restrictions on their shares and have no liquid platform on which they can trade their shares; public companies have greater liquidity. As Facebook's CEO Mark Zuckerberg stated in the company's prospectus: "We're going public for our employees and our investors. We made a commitment to them when we gave them equity that we'd work hard to make it worth a lot and make it liquid, and this IPO is fulfilling our commitment. As we become a public company, we're making a similar commitment to our new investors and we will work just as hard to fulfil it" (Taulli, 2012).

By going public, a company is able to create a market for its stock, which is much more liquid than stock in a private company. Liquidity is usually created for the investors, institutions, founders, and owners. Liquidity provides investors and company owners an exit strategy, and portfolio diversity. Liquidity is also one of the reasons why public companies are valued so much more than private companies (Rankin, 2008). According to Garland and Reilly (2003), the common stock of a private company is not as liquid as the common stock of a publicly traded company. This is because stocks in a private company do not have the same degree of marketability as publicly traded stock. The general principle against which marketability is measured is in stocks that are actively traded on public exchanges (DiMattia, 2008).

2.5.1.3. Increased valuation

Undoubtedly, the prices of shares incorporate information about a company and signal the true market value. Hence, by going public the company's owner receives valuable information from dispersed investors and uses share prices to infer investor valuations of the company (Maug, 2001:3). According to Rankin (2008), the market value of a public company is considerably higher than that of a private company within the same structure in the same industry. Statistics published by the United States Chamber of Commerce revealed that vendors of private companies receive an average of four to six times their net earnings, as oppose to an average of twenty five times of net earnings for public companies. Hsieh, Lyandres and Zhdanov (2007) real options based model established that private companies' managers face uncertainty about the true value of a company and the optimal acquisition strategy. These researchers' findings elucidate that going public reduces the uncertainty about the value of the company and allows the company to carry out an acquisition more efficiently as a public company than as a private company. Rankin (2008) further established that investors in a private company usually discount the value of their equity securities by reason of "non-liquidity" and that the accessibility of other alternatives to raising capital allows a public company greater leverage on its negotiations with both institutional and individual investors than private companies.

2.5.2. Disadvantages/ cost of going public

Gehrig and Strömberg, (2009:4) and Agarwal, (2006) advocate that they disadvantages of going public have direct and indirect costs to the company and investors.

2.5.2.1. IPO administrative cost and fees

IPO is associated to initial direct, fixed and high administrative costs, such as legal fees, audit/accounting fees, underwriter's fee, printing costs, filing fees, and road show expenses (Deazeley 2008). When a company decides to go public, it has no choice but to bear all these costs with the hope that the expected benefits of being a public company will outperform its associated costs (Jargot, 2006:16). Nevertheless, before the decision of going public is made, other indirect costs have to be considered as well. Gehrig and Strömberg (2009:4) assert that the indirect costs associated with going public entails the dilution of selling shares at an offering price that on average is lower than the market price after the open trading has commenced (resulting to a phenomenon known as underpricing). Underpricing arises because

both the investors and the public have little or no information regarding the company going public and thus have to rely on the information disclosed by the business. Additionally, Evans (2006) observed that the minimum required time for businesses going public is approximately six months and that many successful IPO's take over one year. However, an IPO can take several years in cases where the market is down and this could have a negative effect on the company in that; useful time and money which would have been spent on growing the company will be diverted to the IPO procedures and may cause a drop in sales volume and negatively impact on the company's balance sheet and income statement. Likewise, Jargot (2006:16) adds that the risk of an unsuccessful IPO should be taken into account as any delay or failure of the IPO could have a negative impact on the growth plans of the company, and in extreme cases could lead to bankruptcy.

2.5.2.2. Adverse Selection

Investors are generally less informed about the true value of a company going public than the issuing company. Adverse selection is triggered by information asymmetry as IPOs necessitate the sale of securities in a company in which some of the existing shareholders might have non-public information (Agarwal, 2006). This information asymmetry adversely affects the average quality of companies seeking new listings and hence the price at which the shares are sold. According to Padachi, Narasimhan, Durbarry and Howorth (2008:45), issues relating to information asymmetry, moral hazard and adverse selection are likely to arise in contractual arrangements between issuing company and external providers of finance (investors). These problems may well be more severe obstacles to the listing of young and smaller companies, and the associated costs much higher for young and smaller companies that have a low visibility and little proven track records. Consequently, Jargot (2006:17) elucidate that most small companies prefer obtaining capital by selling shares to a small number of venture capitalists since they will experience a lower cost of information production. However, the associated cost of using venture capitalists to obtain capital is that the issuing company will lose significant bargaining power and require higher rates of return in exchange for reduced diversification. On the other hand, selling shares to a large number of small investors, as in the case of private placements, means that investors will be fully diversified and have almost no bargaining power. Nevertheless, going the IPO route is also associated with the investor's duplicative costs of learning about a company and this means that the issuing company will have to convince a much larger group of investors that the company's projects are worth investing in.

2.5.2.3. Greater degree of information disclosure and scrutiny

When a company moves from private to public ownership, there are increased disclosures since the number of people who have access to its financial records increases. A company going public is expected by the securities commissions, stock exchanges and regulators to release information on a regular basis so that investors and potential investors can make an informed decision on whether to buy, sell, or hold their stocks (Cox, 2012). This disclosure role forces companies going public to unveil information whose secrecy may be crucial for their competitive advantage. Ritter (1998:1) adds that when businesses go public, the company gets added obligations in the form of transparency and disclosure requirements, and becomes accountable to a large group of relatively anonymous shareholders. Deazeley (2008) also observed that other factors negatively related to the process of going public includes; disclosure / due diligence burden and relationship challenges experienced when dealing with existing shareholders and/or management, and time commitment and distraction from the day-to-day running of the business. However, Botosan (1997:325) provided evidence that information disclosure is not all that bad as an increased disclosure on the part of the company can decrease its cost of equity. By decreasing its cost of equity, a company is able to raise more capital in a cost effective manner, invest in more projects and enhance its valuation.

The above literature on the advantages and disadvantages of going public emphasised that there are numerous advantages and disadvantages of going public. While the benefits of going public not only help companies to raise capital for current and future projects (which does not need to be repaid); it also enables companies to increases its liquidity and reduce the uncertainty about the value of the company. Staying private, on the other hand, allows a company to have complete control over its business, not entitled to disclosing information to the public and does not incur any direct or indirect cost associated with going public. Nevertheless, the capital raised by private companies using equity or debt financing is subject to fixed interest which has to be repaid and their shares are not liquid and cannot actively be traded on public exchanges. In spite of the disadvantages of going public, many companies find that going public is the most effective way to expand their business quickly without the use of debt financing.

The question of whether to go public or remain private rests solely in the hands of the existing shareholders of the company. Before deciding whether or not to go public,

companies should evaluate all of the potential advantages and disadvantages that will arise and determine if it is in the best interest of the company. If a company is not in a good position to go public, the decision may actually hurt the company more than it helps. Even though capital is raised from the offering, the costs of setting up and maintaining public companies are high, and should be taken into consideration before making a decision. Moreover, the success of the going public necessitates selecting the right participants, since there are several classes of participants involved in the IPO process.

2.6. KEY PLAYERS IN THE IPO PROCESS

The IPO process is a time-consuming and expensive process and in order to ensure the effective functioning and success of the IPO process, selecting the right participants is very critical. There are several classes of key players involved in the IPO process but the five main players this study identifies include; the existing shareholders that want to sell their shares; the issuing company, the underwriters, Security Exchange Commission (SEC) and the public investors that want to buy shares. There are other third parties, individuals and organisations that assist the key players to achieve their objectives in completing the IPO process.

2.6.1. Existing shareholders or Vendors

Shareholders are the owners of companies. They can also be viewed as individuals, groups, or an organisation that owns one or more shares in a business, and in whose name the share certificate is issued (Murray, 2013). Shareholders play an important role in the financing and control aspects of a business. Shareholders play a direct and indirect role in a company's operations. They are responsible for electing the directors and mangers of their companies and may at any time remove managers and directors, thereby ensuring managerial accountability. For early stage companies where there is no sufficient cash to meet the working capital requirements of the business and access to finance from banks, outside investors or other third party sources is limited; shareholders may decide to finance the company's initial working capital requirement themselves by contributing either share capital or loan capital funds to meet the company's initial working capital requirements (Emmet and Scully, 2003:10-11). As the business' needs for capital increases and available cash flow is not sufficient, to the extent that third party sources of finance do not become available, shareholders must decide amongst alternative sources of capital investment that have differing effects on their control rights (Poulsen & Stegemoller, 2005:8). A study by the NYSE Euronext (2008) established that as high growth companies reach a threshold at which

the capital needed to finance their expansion and growth can no longer be provided by the founding shareholders alone, existing shareholders see going public as a way to overcome this constraint and diversify their sources of finance. By issuing shares, the company reinforces its equity and obtains large cash position. Also, given that the buying and selling of shares in an unlisted company can be complex due to the lack of liquidity and clear pricing, shareholders might prefer going public. IPO provides an opportunity for company's existing shareholders to either sell all their shares or gradually once the company is listed. Shareholders can also choose to increase their stake in the company through IPOs and share the risks with new shareholders while also benefiting from the potential increase in the company's value.

Studies by (Brau & Fawcett, 2006:406; Zingales, 1995; Mello & Parsons, 2000) propound that an IPO allows existing shareholders to cash out. IPOs act as an opportunity for shareholders to cash out and as a result, owners of shares in an issuing company sell their shares for personal gain where they prefer to trade their shares for cash. Geddes (2003:1) adds that the purpose of shareholders selling their shares is to maximise proceeds, maximise the value of share performance and be seen to be part of a successful transaction. Likewise, Brealey and Meyers (2003:406) note that existing shareholders who invested money in the company in the past and want to cash in their investments to realise the profits will go public to sell part or all of their shares in the company.

2.6.2. The Issuing Company

The issuing companies are already existing companies that decide to sell their shares to the public. The issuing companies are in business in order to create value for their shareholders, which is also very imperative to the success of an IPO. Geddes (2003:2) asserts that the objectives of the issuing company is to maximise proceeds, built a broad stable ownership base, raise the company's profile to facilitate future fund raising, possible future acquisition, and ensure that there is good liquidity in the secondary market for trading. The company also ensures that they keep the investors happy with immediate modest share price increases. They provide all the necessary documentation required to prepare the registration document and are very actively involved in all aspects of the registration process (Martinez & Perron, 2004:20). Also, Westenberg (2011) elucidates that the company's CEO and CFO act as a liaison between the board of directors and the working group. They also guide the company in the

IPO preparations, in the selection of managing underwriters (investment banks), the size and composition of the offering, and the selection of counsel and other advisors.

After the company has decided to go public, the next important step is to choose the underwriters or investment banks to give advice and perform the underwriting functions related to the offering.

2.6.3. Underwriters or Investment banks

According to Lewellen (2006:614), underwriters are third-party intermediaries who produce information about new issues and certify the issue price. The underwriters function as an intermediary representing the interest of both the issuing company and the investors (Jenkinson & Ljungqvist, 2001). Selecting the right underwriter is one of the single most important decisions the company will make as part of the IPO process (PLI's Treatise, 2010:15; Aberman, 2006). No underwriter can guarantee that an IPO will be successful, but however, the company can increase the likelihood through its choice of the underwriters they select. As a result, companies usually consider criteria such as track record, reputation and experience, team members, commitment to the company, distribution reach and mix, aftermarket support, analyst coverage, client satisfaction, economic factors, financial strength and stability as relevant factors in choosing from among competing investment banks (PLI's Treatise, 2010: 15-20; Allison, Hall & McShea, 2008:7). Keaney and Sawyer (2011:2167) highlight the importance of underwriter reputation and relationships as factors that influence the inclusion of an underwriter as a syndicate. Likewise a study by Deliotte (2010:18-20) found the underwriters' reputation to be of great importance in an IPO. Investors judge an underwriter's ability, effort, and honesty by observing the past performance of the underwriters. Investors also have greater confidence in a company, if a highly regarded investment banking firm is named in their prospectus as the lead underwriter. Reputation can also influence the lead underwriter's ability to organise a strong syndicate of other underwriters to help in the selling and distributing of the shares.

Aberman (2006) further elucidates that while the issuing companies are so selective in their choice of underwriters, many underwriters are equally selective of their clients. Because underwriter's reputation depends on successful issues, few underwriting companies will be willing to stake their reputation on questionable issuing companies. Consequently, underwriters make a decision between firm commitment and best effort commitment when

accepting a company for initial listing. For profitable and established private companies, underwriters are willing to make a firm commitment arrangement. Based on the firm commitment, the underwriter agrees to buy all issues shares, irrespective of their abilities to sell them at a particular price. For riskier or less established companies, an underwriter may offer a best effort arrangement for the initial public offering. A best efforts contract requires the underwriter to buy only enough shares to fill investor demand. Under this arrangement, the underwriter accepts no responsibility for unsold shares. Megginson and Smart (2008:203) note that a firm commitment is an offering in which the investment bank agrees to underwrite a company's securities, thereby guaranteeing that the company will successfully complete its sales of its securities. This arrangement requires the investment to bear a risk of inadequate demand for the company's shares. The investment banks bear the risk in two ways. Firstly, they form an underwriting syndicate consisting of many investment banks and then collectively purchase the shares, thereby spreading the risk across the syndicates. Secondly, the underwriters spend a lot of time and efforts to determine whether a sufficient demand of a new issue exists before it comes to the market. With such research efforts before the sales, the risk that the investment banks might not be able to sell the shares that it underwrites is small. Conversely, with the best efforts, the investment bank promises to give its best efforts to sell the company's securities at an agreed upon price, but if there is insufficient demand for the issue, then the company withdraws the issue from the market. Baker and Powell (2005:333) postulate that firm's commitment is more common for large issues than best efforts underwriting and that the attractiveness of the best efforts and firm commitment efforts depend on the flotation cost and the risk of getting the desired funds. Best effort commitments are more expensive than firm commitment due to high flotation cost and greater underpricing. Best efforts issues are for companies whose financial performance is questionable or those with unproven track record including new speculative companies. Hence, the issuing company bears the risk of getting the desired funds, while the investment banks do not bear the risk of underwriting or guaranteeing their offerings.

2.6.4. Securities and Exchange Commission (SEC)

The Securities and Exchange Commission (SEC) is the chief regulating body in the securities industry. SEC's main function is to protect investors by preventing fraud, insider trading, and other deceptive and fraudulent practices in the stock market (Kennon, 2012). The role of SEC in an IPO is to ensure that they review all IPO registration statements, make general

comments on the disclosures and more specific comments regarding the financial and accounting matters. These reviews enable them to disclose all the necessary and relevant information investors will require in making an informed decision (Machmeier et al., 2006:14-15). SEC also compels full disclosure to investors of material facts about securities offered and sold in interstate commerce. SEC ensures that before an issue of securities is offered for public sales, the issuer must file with SEC a registration statement giving complete information on such securities and on the issuing company. SEC then examines the statement and may refuse registration if it appears to be inaccurate, or incomplete. In the case where registration is denied, the shares will not be offered for sale. Aberman (2006) propounds that for companies that have gone public through an IPO; SEC requirements do not end with the issuance of shares as continued disclosures must be made concerning the general health of the company, the details of operations, the key employees and shareholders. Also, because these disclosures are so numerous, there is a significant cost involved that the issuing companies should take into consideration when going public.

2.6.5. Investors

Investors are people from the public society that buy the shares offered by the issuing companies. Geddes (2003:1-2) highlights that the objectives of investors in an IPO is to maximise the short and long terms share price returns, broaden and diversify their portfolio and accumulate a position not easily found in the secondary market. There are usually two types of investors; institutional and retail investors. Institutional investors are usually the most important stock buyers, who buy almost 70% - 90% of shares in the IPO and participate in approximately 70% of daily trading on the stock markets (Martinez & Perron, 2004: 22). Retail investors buy securities and commodities on their own behalf and usually purchase stocks in smaller proportions than institutional investors. Most underwriters prefer institutional investors since they can buy large volumes of shares and are willing to handle the risk by holding the shares for a long period of time (Geddes, 2003:1-2). These investors that hold their shares for a long period gain voting rights towards the issuing company and can partake in the decision making of the company.

Malakhov (2007:7) notes that informed and uninformed investors usually make their investments and strategic decisions when buying shares based on the amount of information available (Draho, 2004:182-184). Asymmetric information between company's insiders and investors over the value of a company is a constraint that influences the financial decisions.

Informed investors usually have information about the competitors, future regulatory reforms, and the general conditions of the economy and financial markets that the issuing company does not have and thus are able to make a better assessment regarding the long term value of the company. Uniformed investors usually have sufficient funds to buy the entire offerings but are however not willing to participate because of the adverse selection problem. Thus uninformed investors usually want to have to be compensated through an underpricing of IPOs which can enable them to break-even on average (Malakhov, 2007:7). Lin, Ma and Xuan (2010) elucidate that while companies that operated under lower informational transparency experienced greater financial challenges as this greatly reduced the attractiveness and marketability of their shares to investors; liquidity savings on its part makes the financial position stronger and thus attract more investors to invest in companies which show a positive effect on the stock market price.

In conclusion, the above literature on the key players on the IPO process highlighted that they all play a critical role to ensure the effective functioning and success of the IPO process. While the existing shareholders play an important role in controlling key aspects of a business, they are also the people who make a decision when a company reaches a threshold at which the capital needed to finance their expansion and growth can no longer be provided by the founding shareholders alone. Existing shareholders see going public as a way to overcome this constraint and diversify their sources of finance. SEC's main function is to protect investors by preventing fraud, insider trading, and other deceptive and fraudulent practices in the stock market. The issuing companies are the people that provide all the necessary documentation required to prepare the registration document and are very actively involved in all aspects of the registration process. Their main objective is to maximise proceeds, build a broad stable ownership base, raise the company's profile to facilitate future fund raising, possible future acquisition, and ensure that there is good liquidity in the secondary market for trading. The underwriters are third-party intermediaries representing the interest of both the issuing company and the investors.

Selecting the right underwriter is one of the single most important decisions the company and existing shareholders will make as part of the IPO process (PLI's Treatise, 2010:15; Aberman, 2006). Given that no underwriter can guarantee that an IPO will be successful, the existing shareholders and company can increase the likelihood through its choice of the underwriters they select (firm commitment and best effort commitment). Firm commitment is

usually preferred to best effort commitment because the underwriter agrees to buy all issues shares, irrespective of their abilities to sell them at a particular price. Also, given that the underwriter's reputation depends on successful issues, they will do everything in their power to ensure they sell the shares. Moreover, in selecting the right underwriter it becomes imperative that companies and existing shareholders consider criteria such as track record, reputation and experience, team members, commitment to the company, distribution reach and mix, aftermarket support, client satisfaction, analyst coverage, economic factors, financial strength and stability as relevant factors in choosing from among competing underwriters. Furthermore, before investors make an investment decision, it is imperative that they have a basic knowledge about the company they want to invest in, while also taking into consideration the business fundamentals, the objectives and policies of the business, the business current market shares, its product/ services offerings and its competitors (Guleria, 2010). Selecting the right company will enable the investors to reap the value from their investment in the long run.

In addition, because companies usually want their shares to be traded on either the stock exchange or other established markets at the completion of the offerings (Machmeier, et al., 2006), the companies going public must make certain that they adhere to the initial listing standards that must be met for quotation on each security exchange, and ongoing standards for continuous listing. As such, it becomes necessary to examine the Johannesburg Securities Exchange (JSE), and the standards for listing.

2.7. IPOS IN SOUTH AFRICA- JOHANNESBURG SECURITY EXCHANGE (JSE)

The JSE was established in November 8, 1887 as a stock exchange and it is now one of the top twenty security exchanges in the world in terms of market capitalisation (Alli, Subrahmanyam & Gleason, 2010:4). The Johannesburg Securities Exchange (www.jse.co.za) is a platform which enables the ease of trade for companies listed in South Africa, while also ensuring that these companies operate within stipulated rules and regulations (Brown, 2004:4). The JSE has functioned as a market place for financial products for more than 125 years where buyers and sellers connect in four different markets (equities, commodity derivatives, equity derivatives and interest rate products). The JSE has two boards: JSE Main Board and JSE Alternative (AltX) board, whose aims are to provide companies with financial information and the opportunity to raise capital in a highly regulated environment (Profile Financial Markets Directory, 2012).

The main board is meant for listed companies who have a minimum subscribed capital of R25 million (determined by the fair value of the assets), an assessed profit history of R8 million over the past three years and the listed company should have an excess of 20% issued capital (Deloitte & Touche, 2003). AltX is the alternative exchange launched in 2003 as a nursery for the JSE main board, which aimed at replacing the unsuccessful venture capital and development capital boards established as sub divisions of the main board in the 1980s. AltX was created to provide small to medium sized enterprises (SMEs) who had smaller income/profits and had not been in existence for a long time, with a public listing option, and conditions that were not as strict as the ones for the JSE Main Board (Manikai, 2011:8). Brown (2004:7-8) elucidates that AltX caters for a segment of the market which would have found it difficult to be listed on the JSE Main Board due to its inability to meet with the listing requirements and its perceived riskiness. He pointed out that the few companies that managed to survive and grow were moved from AltX to the main board, and ultimately transferred from small start-ups to establish companies. Brown (2004) further advocates that it is usually of great value for investors to have some investment in stocks trading on the AltX, within small amount and across different sectors, because during their transition period from AltX to Main board, their investments could yield great profits.

2.7.1. Criteria for listing in the JSE

According to Manning (2011:1-2), the JSE listings requirements fall into two categories: general principles and the main body of the listings requirements. The general principles must be observed by all corporate actions and by all submissions pertaining to securities listed and to be listed. The general principles ensure the presence of a market for the raising of primary capital, ensure that a full disclosure is made to shareholders that allow them to vote on substantial changes on the listed company, and when public disclosures are made regarding matters that are price sensitive (Visser, 2009:4). The main body of listing requirements comprises of the sections, schedules and practice notes derived from the application and interpretation of the general principles by the JSE. The time frame for listing a company usually takes between 9 and 13 weeks, based on the listing method used, the competence of the professional advisors and the complexity of the listing (Jenny, 2009).

With regards to the listing criteria, (Manikai, 2011:8) makes a comparison between the listing criteria for the Main Board and AltX listing platforms. This is explained in Table 2.1 below:

Table 2. 1 : Differences between the listing criteria for the JSE Main Board and AltX

Criteria	JSE Main Board	JSE AltX
Minimum capital	R25 million	R2 million
Minimum number of shares	25 million	Not prescribed
Share spread	A minimum of 500 public shareholders, holding a minimum of 20% of the issued share capital	A minimum 100 public shareholders, holding a minimum of 10% of the issued share capital
Escrow Shares	There are no provisions for escrow shares and all the shares held by the founder, the promoters, or controlling shareholder are sold immediately on listing (subject to market conditions)	50% of the shares held by the directors are sold immediately upon listing. The remaining shares must be held in escrow.
Profit history	Satisfactory three year audited profit history	Projected profit for next two years
Profit Forecast at time of listing	No profit forecast is required at the time of listing	The company is obliged to provide the JSE with a profit forecast for the rest of the current year and one additional year (does not have to be published)
Public shareholders: - % of each class of shares - Number of ordinary shareholders -Number of preference shareholders	20% 500 50	10% 100 Not prescribed
Minimum listing	100 cent	Not prescribed

price		

(Source: Manikai, 2011: 8; Magliolo, 2012)

From Table 2.1, it can be seen that the JSE main board and AltX criteria for listing are different and that certain criteria's have been reduced on the JSE AltX. The JSE AltX has a reduced listing fee and a separate listing requirement, which was put in place in order to facilitate the listing of smaller companies that had the potential of becoming successful companies. The companies that survive and grow are usually migrated to the JSE main board as it reaches a mature stage within its business cycle. Moreover, when comparing the criteria for listings on the JSE to that of other stock markets such as the NASDAQ, New York stock exchange, London stock exchange, the Nairobi stock exchange, and the Nigerian stock exchange, it becomes evident that each stock market sets its own listing standards. As such, before a company becomes listed initially, it must adhere to all the minimum financial and non-financial standards for that particular stock market.

2.8. CHAPTER SUMMARY

This chapter provided the background of this study. This chapter began by examining the role of stock exchange in facilitating the IPO process. The stock market was identified as one of the most significant markets to investors and shareholders since it is here that the price of stocks and the value of all publicly owned companies are established. The stock market was divided into the primary and secondary market. The primary market was defined as a market where investors purchase newly issued securities, which usually take place during an IPO where companies offer stock for sale to the public for the first time. A secondary market is the market where investors trade previously issued securities either directly with other investors, indirectly through a broker who negotiates the transactions for others or directly with a dealer who buys and sells shares. Also, the stock exchange was also identified to provide benefits to the company, to investors and to the society at large. To companies, the stock exchange ensured that companies whose shares have been listed on a stock exchange enjoyed a better goodwill and credit-standing because they are financially sound. To investors, the stock exchange created a platform for investors to enjoy the convenience of buying and selling shares at will and also provides regular information on prices of securities traded at the stock exchanges. To the society, the stock exchange provided a lucrative avenue for investment and liquidity and thus encourages people to save and invest in long-term

securities. These factors attested to the central role of the stock exchange in facilitating the IPO process and enabling IPO companies in achieving their numerous motives.

Also, the history of IPOs highlighted that the history of the stock market is full of remarkable events that have earned their own names, such as the "Great Crash" of 1929, the "Tronics Boom" of the early 1960s, the "Go-Go Years" of the late 1960s, the "Nifty Fifty" bubble of the early 1970s, the "Black Monday" crash of October 1987, the "Dot.com" bubble of the 1990s". Also evident was that fact that there had been substantial fluctuations both in terms of the number of companies going public and the capital raised over time, with factors (the adverse-selection costs of issuing equity, capital demands and investors sentiments) identified as reasons accounting for these variations. This means that there are important factors or motives explaining why companies chose to go public rather than staying private.

In understanding the motives why companies choose to go public, this study recognised primary motives (financing and harvesting) and secondary motives (public relation tool and talent attraction) for going public and these motives are often specific to each company. It was established that the primary motives for going public provide an opportunity for alternative sources of equity and debt financing for businesses that are constrained in their ability to raise equity or debt capital, and finally a time for its owner's time to cash in on all their hard work. The secondary motives enabled businesses to increase the public's knowledge of the company's existence and in the process of getting public attention, attract highly qualified human talents. While all of these motives are important, the main goal for every company going public is however to raise capital. Nonetheless, before going public, a company needs to consider its advantages and disadvantages before making a decision.

Moreover, the literature on the advantages and disadvantages of going public emphasised that there are numerous advantages and disadvantages of going public. While the benefits of going public not only help companies to raise capital for current and future projects (which does not need to be repaid); it also enables companies to increases its liquidity and reduces the uncertainty about the value of the company. Staying private, on the other hand allowed a company to have complete control over its business, not entitled to disclosing information to the public and not incur any direct or indirect cost associated with going public. Nevertheless, the capital raised by private companies using equity or debt financing is subject to fixed interest which has to be repaid and their shares are not liquid and cannot actively be traded on

public exchanges. In spite of the disadvantages of going public, many companies find that going public is the most effective way to expand their business quickly without the use of debt financing. This study concluded by stating that the question of whether to go public rests solely in the hands of the company. Before deciding whether or not to go public, companies should evaluate all of the potential advantages and disadvantages that will arise and determine if it is in the best interest of the company. If a company is not in a good position to go public, the decision may actually hurt the company more than it helps. Even though capital is raised from the IPOs, the cost of setting up and sustaining public companies are high, and should be taken into consideration before making a decision. Moreover, the success of the going public necessitates selecting the right participant, since there are several classes of participants involved in the IPO process.

Furthermore, the existing shareholders, the issuing company, the underwriters, the investor and the Securities and Exchange Commission (SEC) were identified as the key players on the IPO process. They were all found to play a critical role to ensure the effective functioning and success of the IPO process. While the existing shareholders play an important role in controlling key aspects of a business, they are also the people who make a decision when a company reaches a threshold at which the capital needed to finance their expansion and growth can no longer be provided by the founding shareholders alone. Existing shareholders see going public as a way to overcome this constraint and diversify their sources of finance. The issuing companies are the people that provide all the necessary documentation required to prepare the registration document and are very actively involved in all aspects of the registration process. Their main objective is to maximise proceeds, build a broad stable ownership base, raise the company's profile to facilitate future fund raising, possible future acquisition, and ensure that there is good liquidity in the secondary market for trading. The underwriters are third-party intermediaries representing the interest of both the issuing company and the investors.

Selecting the right underwriter is one of the single most important decisions the company and existing shareholders will make as part of the IPO process. Given that no underwriter can guarantee that an IPO will be successful, the existing shareholders and company can increase the likelihood through its choice of the underwriters they select (firm commitment and best effort commitment). Firm commitment is usually preferred to best effort commitment because the underwriter agrees to buy all the shares, irrespective of their abilities to sell them

at a particular price. Also, given that the underwriter's reputation depends on successful issues, they will do everything in their power to ensure they sell the shares. Moreover, in selecting the right underwriter it becomes imperative that companies and existing shareholders consider criteria such as track record, reputation and experience, team members, commitment to the company, distribution reach and mix, aftermarket support, analyst coverage, client satisfaction, economic factors, financial strength and stability as relevant factors in choosing from among competing underwriters. Furthermore, before investors, make an investment decision; it is very imperative that they have a basic knowledge about the company they want to invest in, while also taking into consideration the business fundamentals, the objectives and policies of the business, the business current market shares, its product/ services offerings and its competitors (Guleria, 2010). Selecting the right company will enable the investors to reap the value from their investment in the long run. In addition, because companies usually want their shares to be traded on either the stock exchange or other established markets at the completion of the offerings (Machmeier, *et al.,* 2006), they companies going public must make certain that they adhere to the initial listing standards that must be met for quotation on each exchange, and ongoing standards for continuous listing.

The last part of this chapter examined the JSE and its standards for listing. The Johannesburg Securities Exchange was found to be a platform which enables the ease of trade for companies listed in South Africa, while also ensuring that these companies operate within stipulated rules and regulations. The JSE has two boards: JSE Main Board and JSE Alternative (AltX) board. The main board is meant for listed companies that have a minimum subscribed capital of R25 million (determined by the fair value of the assets), an assessed profit history of R8 million over the past three years and the listed company should have an excess of 20% issued capital. AltX is a nursery for the JSE main board, which aimed at replacing the unsuccessful venture capital and development capital boards established as sub-divisions of the main board in the 1980s. When looking at the listing criteria on the JSE, it was observed the JSE main board and AltX criteria for listing were different and that certain criteria have been reduced on the JSE AltX. Also, it was established that each stock market sets its own listing standards. As such, before a company becomes listed initially, it must adhere to all the minimum financial and non-financial standards for that particular stock market. Based on the above, it becomes necessary to find out how the market reacts to the IPOs in the short and long run.

CHAPTER THREE

IPO RETURNS

"The individual investor should act consistently as an investor and not as a speculator. This means that he should be able to justify every purchase he makes and each price he pays by impersonal, objective reasoning that satisfies him that he is getting more than his money's worth for his purchase" (Graham, 1949)

3.1. INTRODUCTION

Generally, when companies go public, their primary motives are to obtain funds for expansion and or to harvest. In the process of obtaining financing, most companies and existing shareholders get hurt since they are not able to attract the much needed capital to either finance their investment projects or to harvest as a means to get out of the business and ideally reap the value (cash flow) from their investment. Investor's buying the shares most often get abnormal returns in a very short time and incur big loses in long run (Kaya, 2012:64). These phenomena (IPO anomalies) are termed underpricing and long run underperformance. These abnormalities have been acknowledged in most financial markets around the world (Jenkinson & Ljungqvist, 1996) and the degree of occurrence varies across different markets. As such, it has become an increasing concern to investors, existing shareholders and companies as they try to find out possible explanations for this high initial returns and long run underperformance.

This chapter begins by making a distinction between absolute and relative returns. Thereafter, existing theories and concepts on underpricing will be explained. Subsequently, the theories and concepts on long run underperformance are examined.

3.2. ABSOLUTE AND RELATIVE RETURNS

Generally, the motto of every investor is to earn maximum returns on their investment, both in absolute and relative terms (Asma, 2010:8). Absolute returns are the returns (gain or loss on an investment portfolio) that a particular asset achieves over a certain period which is not compared to other measures or benchmarks. Relative return is the difference between the absolute return and the performance of the market which is usually gauged by a benchmark, or other index. Beuaumont (2004:150) views relative returns as returns whose performance is evaluated relative to a benchmark or an index, while absolute returns are the returns which

are managed without references to a particular benchmark or an index. Absolute returns target positive returns on investments over a given period of time, irrespective of market conditions. Conversely, relative returns look to outperform a market benchmark or index but has no commitment to deliver positive returns (Threadneedle Asset Management, 2010:2). Waring and Siegel (2006:15) state that the benefits of absolute returns are that they offer potentially higher returns than relative returns. Moreover, absolute returns have the potential to offer positive returns when traditional share markets are falling.

Furthermore, Johnson (1999:38-39) maintains that most investors in the investment environment focus primarily on relative returns when evaluating the success of a business. This is because most of these investors have diversified portfolios across different markets and industries and are satisfied when a particular stock outperforms its benchmark, and unhappy when the stocks underperforms its benchmark. Moreover, a study by the Threadneedle Asset Management (2010:3) showed that portfolios that have exposure to both relative and absolute returns were most likely to have a more attractive risk to return profile than portfolios that were restricted to one type of strategy. A study by the RS Research Paper (2007:4) on Hong Kong found that the relative performances were worse than those of absolute performance for IPOs listed in 2006.

Drawing from the above, it is seen that absolute and relative returns are both important to investors. Most often, investors focus on relative returns since it gives them a clear picture of how well their portfolios are performing relative to similar portfolios on the market. It also gives investors an indication of which portfolios are profitable to invest in. However, Apreda *et al*. (2005:56) maintain that the focus on relative returns may lead investors to invest in riskier portfolios, change their current portfolio more often and hold on to loosing portfolios for too long. Chye (2004:2) emphasise that more focus should be placed on absolute returns since absolute returns require investors to invest in any portfolio deemed profitable. This means picking potential winners and avoiding losers. Notwithstanding, the debate on whether to focus on absolute or relative returns rests solely in the hands of the investor. However, it is imperative for investors to focus on both absolute and relative returns since portfolios exposed to both absolute and relative returns are most likely to have a more attractive risk to return profile than portfolios that are restricted to one type of strategy.

3.3. UNDERPRICING

Underpricing, also known as initial abnormal returns occurs when the closing price at the end of the first day of trading is higher than the initial offer price (Heeley, Matusik, & Neelam, 2006:2). This means that the value at which the company sold its shares to the public was lower than their actual market value. When the offering is underpriced, the issuing company has "left money on the table." This implies that companies lost out on additional capital that would have been gained, if the offer was priced more accurately reflecting the true value of the business. Adams, Thornton and Baker (2009:55) define initial abnormal return as the "abnormal gains/losses of a new issue relative to the offer price during the first day of trading". Christiansen (2011:15) notes that when the closing price at the first day of trading is lower than the offer price it is termed overpricing. This phenomenon is observed in some IPO markets but it happens more rarely than underpricing. Brealey and Myers (1991) affirm that underpricing is one of the ten mysteries in financial study. Khurshed and Mudambi (1999) maintain that one of the most explored abnormalities in finance is why IPOs provide significant abnormal returns on the first days of trading. This abnormality has been acknowledged in most financial markets around the world (Jenkinson & Ljungqvist, 1996:4).

In understanding the issue of underpricing, Loughran, Ritter and Rydqvist (1994) reckon that there are different explanations for this phenomenon, and they vary across different stock markets. Underpricing is one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity in underpricing across stock markets and regions. In the Asian region, Chen, Firth and Jeong-Bon (2004:292) reported an underpricing of 145% in China. Boulton, Smart and Zutter (2007:28) demonstrated evidence of underpricing for Indonesia (41%), Malaysia (41%), South Korea (44%), Taiwan (13%), and Thailand (26%). Moreover, Loughran, Ritter and Rydqvist, (2010:1-2) collected results from various studies in 47 countries around the world on the average first day returns and observed that the highest first day returns were recorded in Jordan (149%) for a sample of IPOs dating from 1999-2008, 96.6% in Malaysia for a sample of IPOs dating from 1980-2006 and 92.7% in India for the sample of IPOs dating from 1990 to 2007.

Furthermore, the Latin American emerging markets, Aggarwal, Leal and Hernandez (1993) reported an underpricing of 79% in Brazil, 16% in Chile, and 3% in Mexico. Boulton *et al.* (2007) found 44% initial returns in Argentina. Additionally, the level of underpricing in the

European emerging markets showed an initial returns of 28% in Greece (Boulton *et al.,* 2007), 13% in Turkey (Kiyamz, 2000: 213), 15% in Hungary and 55% in Poland (Lyn and Zychowicz, 2003:181). In Africa, Omran (2004) established an initial underpricing of 8% in Egypt. Van Heerden, and Alagidede (2012:132) using data for 138 South African IPOs that were listed on the JSE from 2006 to 2010, found significant short run underpricing on the JSE, with an average market-adjusted return for the first trading day of 108.33%. Thus, it is evident that underpricing is one of the most prominent abnormalities that have been acknowledged in most financial markets, irrespective of the time period investigated.

Khurshed and Mudambi (1999) point out that prior studies on IPOs have reported differences in underpricing by looking at the variations in underpricing by offering type, country, underwriter reputation, industry type, hot and cold markets, and different characteristics of the offerings. Levis (1990) examined 712 IPO companies between 1980 and 1988 on the London Stock Exchange (LSE) and established that the average abnormal return on the IPO day is 14.3%. Ritter and Welch (2002) researched on IPOs in the US between 1980 and 2000 and revealed that the share price of IPOs had risen by 18.8% at the end of the first day of trading. Similar studies by Ellul and Pagona (2006) on 337 IPOs in LSE from 1988 and 2000, also found the average first-day abnormal return to be up to 47.7%, which shows that first-day abnormal returns have changed over time. Loughran, Ritter and Rydqvist (2010:1-2) collected results from various studies in 47 countries around the world on the average first day returns, as seen in Table 3.1 below:

Table 3.1: Average first day returns of 47 countries around the world

Country	Sample size	Time period	Average Initial returns
Argentina	20	1991-1994	4.40%
Australia	1,103	1976-2006	19.80%
Austria	96	1971-2006	6.50%
Belgium	114	1984-2006	13.50%
Brazil	180	1979-2006	48.70%
Bulgaria	9	2004-2007	36.50%
Canada	635	197-2006	7.10%
Chile	65	1982-2006	8.40%
China	1,394	1990-2005	164.50%
Cyprus	51	1999-2002	23.70%
Denmark	145	1984-2006	8.10%
Egypt	53	1999-2000	8.40%
Finland	162	1971-2006	17.20%

France	686	1983-2006	10.70%
Germany	700	1978-2008	25.30%
Greece	372	1976-2007	50.90%
Hong Kong	1,008	1980-2006	15.90%
India	2,811	1990-2007	92.70%
Indonesia	339	1989-2008	21.50%
Iran	279	1991-2004	22.40%
Ireland	31	1999-2006	23.70%
Israel	348	1990-2006	13.80%
Italy	268	1985-2008	16.40%
Japan	2,628	1970-2008	40.10%
Jordan	53	1999-2008	149.00%
Korea	1,490	1980-2008	55.20%
Malaysia	350	1980-2006	69.60%
Mexico	88	1987-1994	15.90%
Netherland	181	1982-2006	10.20%
New Zealand	214	1979-2006	20.32%
Nigeria	114	1989-2006	9.60%
Norway	153	1984-2006	9.60%
Philippines	123	1987-2006	21.20%
Poland	224	1991-2006	22.90%
Portugal	28	1992-2006	11.60%
Russia	40	1999-2006	4.20%
Singapore	519	1973-2008	27.40%
South Africa	285	1980-2007	18.00%
Spain	128	1986-2006	10.90%
Sri Lanka	115	1987-2007	48.90%
Sweden	406	1980-2006	27.30%
Switzerland	159	1983-2008	28.00%
Taiwan	1,312	1980-2006	37.20%
Thailand	457	1987-2007	36.60%
Turkey	315	1990-2008	10.60%
United Kingdom	4,198	1959-2008	16.30%
United State of America	12,028	1960-2008	19.90%

Source: Loughran et al. (2010:1-2)

From Table 3.1 it is observed that the results vary significantly across countries and continents. The highest first day returns were recorded in China (164.50%) for a sample of 1,394 dating from 1990-2005; Jordan (149%) for a sample of 53 IPOs dating from 1999-2008; and 92.7% in India for the sample of 2,811 IPOs dating from 1990 to 2007. Although it is seen that the countries with the highest level of underpricing are found in Asia, some Asian

countries also record very low levels of underpricing (e.g. Hong Kong with 15.90% and Israel with 13.80%). It is also seen that amongst European countries, there are significant differences in the levels of underpricing. For example, the underpricing of IPOs is significantly higher in Greece, Germany, Poland, and the United Kingdom than in France, Denmark, and Netherland. It is possible that this is partly due to differences between the institutional rules and laws in these countries (Ljungqvist, 2007) or the timing of the issues (hot and cold markets). In Africa, only three countries were represented and a possible explanation for this situation is due to absence of many developed markets. Moreover, a possible explanation to these variations in the level of underpricing is because the level of underpricing varying across different markets / countries based on the time period investigated.

Drawing from these findings, it becomes obvious that the underpricing phenomenon is inevitable in most financial markets all around the world, irrespective of the time period investigated but however, the level of underpricing varies across different markets / countries. Consequently, the reasons for these variations on the level of underpricing necessitate further explanations.

3.3.1. Explanations on Underpricing

In attempting to explain the puzzle of underpricing, academic researchers have come up with many different explanations that are based on the economic realities of the IPO marketplace (Khurshed, Goergen & Mudambi, 1999:6). Many of the early theories developed to explain the underpricing phenomenon established that underpricing is either deliberate or a result of information asymmetry between the parties involved during the process of going public. Prior studies (Doeswij, Hemmes & Venekamp, 2006; Hansen & Jørgensen, 2010:4-7; Rajan & Servaes, 2002:20; Ibbotson & Jaffe, 1975) dealing with IPO underpricing have identified a number of theories to explain these abnormalities such as information asymmetry, price stabilizing activity, bandwagon effects, investment bubble, risk aversion on the part of underwriters, and the winner's curse. Since there are many theories explaining abnormal returns, only those relevant for the purpose of this thesis will be explained.

3.3.1.1. Winner's curse theory

The winner's curse theory is considered as one of the most important reasons why underpricing occurs. Rock (1986) puts forth a winner's curse model to explain IPO

underpricing based on asymmetric information between informed and uninformed investors. According to this theory, investors can be classified as 'informed' or 'uniformed'. Rock (1986) elucidated that because of uncertainty in the value of the company, there is asymmetric information between informed and uninformed investors. Informed investors usually have information about the competitors, future regulatory reforms, and the general conditions of the economy and financial markets that the issuing company does not have and thus are able to make a better assessment regarding the long term value of the company. Uniformed investors might have sufficient funds to invest in a specific IPO, but are often not willing to participate because of the adverse selection problem (Draho, 2004:182-184). Consequently, informed investors will only subscribe to underpriced issues while the uninformed investors buy all the shares (i.e. even those issues not purchased by informed investors). Agarwal (2006:31) elucidates that since the uninformed investors will apply to all issues and informed investors will only apply for underpriced IPOs; the underpriced issues will be oversubscribed while the overpriced issues will be undersubscribed. Moreover, uninformed investors who apply for all new issues will find themselves in the long run holding a large amount of overpriced IPOs. Some uninformed investors will either get a fraction of the most desirable issues, or be allocated with most of the least desirable issues. Consequently, they face the winner's curse. However, if all IPOs are priced at their underlying value, the uninformed investors will make systematic losses and leave the market.

Rock's Model has been supported by the study of Khurshed and Mudambi (2002:697) in the UK which found no significant underpricing in investment trusts IPOs and concluded that it was partially due to the disparity of information between uninformed and informed investors about this type of companies. Nevertheless, Christiansen (2011:19-20) criticised Rock's theory for two reasons. The first reason is the division of investors into informed and uninformed investors. She argued that uninformed investors will not directly invest in a company but will probably do it through a more informed channel such as investment funds or through other investors, thereby avoiding the winner's curse problem. The second criticism is that the theory "requires proportional allocation of the shares of over-subscription of the issue." This implies that underwriter have the tendency to prioritize their regular customers in the allocation of shares. Thus, the more uncertainty there is about a company, the more difference there is between informed and uninformed investors.

3.3.1.2. Bandwagon effects

The bandwagon hypothesis, also known as the information cascades, is quite similar to herding. Alm, Berglund and Falk (2009:11-12) view the bandwagon effects as a situation when investors do not only take investment decisions based on their own information about an IPO, but based on other investors (usually the informed or the institutional investors). Welch (1992:1-2) elucidates that underwriters underprice an issue in order to entice the first few potential investors to purchase, which portrays positive information about the issue and thus persuade the later investors to follow them. Since the later investors totally rely on the earlier investors for subscribing to any issue, they will optimally ignore their private information and imitate the earlier investors. Furthermore, Ritter (1998:9) affirms that if there is a trend showing that a lot of investors purchase a particular share, an investor might also buy it though it would never happen based on his/her own analysis. Conversely, investors will not buy shares if they observe that other investors are not buying the shares even when they have favourable information about the company. Consequently, in order to prevent this situation from happening, investment banks use underpricing to persuade and attract the first couple of potential investors, who later on enhance the demand further by the bandwagon effect, in which case all subsequent investors want to buy, regardless of their own information.

In support of the bandwagon effect, a study by Amihud, Hauser and Kirsh (2001) established that IPOs either tend to be undersubscribed or largely oversubscribed, with a small number offerings moderately oversubscribed. Ritter (1998:9) further observed that an interesting implication of the bandwagon effect in conjunction with the market feedback explanation is that it will lead to a positively-sloped demand curve. However, in the case where there is a flip side and investors recognise that a cut in the offering price signals a weak demand from other investors, cutting the offer price will scare away potential investors. A further cut in price could make investors to start wondering if the business is in much need of cash. Consequently, the only alternative the issuing company and the underwriters have is to postpone the offering, and hope that the market conditions improve.

3.3.1.3. The Signalling Hypothesis

Leland and Pyle (1977) and Grinblatt and Hwang (1989) put forth the signalling hypotheses to explain IPO underpricing. Yatim (2011:77) states that in the context of IPOs, the signalling

hypothesis advocates that the issuing company is usually more informed about its future prospects of the company than any other market participants, thus creating information asymmetry. A central tenet of the signalling hypothesis is that the signal must be expensive and difficult to be imitated by lower quality IPO companies. Also, the signal must be recognised in advance. Consequently, high quality companies must effectively reveal to potential investors the value of their companies so that they are able to maximise the price at which they can sell their shares. These high quality companies hire good corporate governance mechanisms to communicate their superior quality to potential investors and thus allow all market participants to effectively utilise the signal.

Allen and Faulhaber (1989:303-304) expound that underpricing a company's offering is a good signal that the company is of good quality to invest in. This is because only quality companies can expect to recoup losses after their performance is realised. Good quality companies find it valuable to underprice their IPOs because by doing so they alert investors to positively interpret subsequent performance. Low quality companies, on the other hand, know their expected performance and subsequent market valuation and as such cannot afford to signal since they cannot recover initial losses from underpricing. Hence, to signal the high value of the companies underwriters turn to underprice the issue.

Allen and Faulhaber (1989:306) further remark that underpricing has advantages over other methods of signalling a business type as it reduces both the likelihood of any damage in a lawsuit if subsequently the business does not perform well. Additionally, underpricing increases the probability of generating more publicity for a good company if the business succeeds.

3.3.1.4. The ownership dispersion hypothesis

The ownership dispersion hypothesis brought forth by Brennan and Franks (1997:1-2) propounds that IPO underpricing usually results in oversubscription of shares and issuer rationing the allocation of shares. A dispersed ownership structure increases liquidity and lowers the required rate of return so as to attain a higher equilibrium price in the secondary market (Booth & Chua, 1996:292). Ritter (1998:10) asserts that issuing companies deliberately underprice their shares in order to create excess demand that can enable them to have a large number of small shareholders. Bouzouita, Gajewski and Gresse (2012:4) point out that companies with a more dispersed ownership generally have a more liquid stock

market and make it more difficult for outsiders to challenge management. Moreover, a more liquid market improves the issuing company's future access to the capital markets by attracting investors; reducing gross fees demanded by underwriters in subsequent equity offerings (Butler, Grullon, & Weston, 2005) and reduces transaction costs in future equity raisings (Ibbotson & Ritter, 1995). Booth and Chua (1996:293,307) note that another advantage of diffuse ownership is that it increases liquidity, and influences the number of potential investors to which the issue is marketed.

3.3.1.5. Leaving a Good Taste Hypothesis

The leaving a good taste hypothesis was proposed by Jegadeesh, Weinstein and Welch (1993). This model theoretically provides some justification as to why a company allows its shares to be discounted in a seasoned offering. Dai (2012:132) suggests that this model assumes that the issuers usually have superior information and takes into account the possibility of future equity offerings when deciding IPO prices. Jegadeesh *et al.* (1993:154) maintain that leaving a good taste hypothesis means big discounts because issuers are willing to leave some money on the table for investors at earlier offerings since companies want to come back later for additional funding. Typically, in this model, companies raise capital through IPOs and expect to raise additional capital in the future through seasoned equity offerings (SEOs). Consequently, high quality companies turn to deliberately underprice their IPOs to distinguish themselves from low quality companies and in so doing raise additional funds under more favorable terms in the future. The price at which a high-quality company expects to issue seasoned equity is higher than what it could anticipate if it did not signal its quality through its IPO pricing decision. As a result, low quality companies are discouraged from imitating the high quality companies since they are less likely to recoup the benefits of underpricing by selling their seasoned issues at higher prices.

However, Jegadeesh *et al.* (1993:155) emphasize that in reality not all companies issue seasoned equity and that some of the companies that underprice their IPOs with the intention of issuing seasoned equity sometimes fail because of unexpected economic shocks.

3.3.1.6. The lawsuit avoidance hypothesis

The lawsuit avoidance hypothesis proposed by Tinic (1988:800) suggests that the issuing companies underprice to reduce legal liability arising from any false and insufficient information found in the prospectus. This model hypothesizes that issuing companies

deliberately underprice their IPOs in order to reduce their vulnerability to lawsuits. Based on Tinic's model, the anticipated legal liabilities are measured by the probability of either the issuer or the underwriter being sued and the amount of reparations suffered by these parties. Hence by selling an IPO share below its true value, both the issuer and the underwriter are less likely to be sued (Lin, Pukthuanthong & Walker, 2013:58).

Although supporters of the lawsuit avoidance hypothesis (Tinic, 1988:800; Lowry & Shu, 2002:311) find evidence in support of this hypothesis in the US, current studies by Zhu (2009:353) and Walker, Turtle, Pukthuanthong and Thiengtham (2011:1,39) have been unsupportive. Other studies by Drake and Vetsuypens (1993) also provide evidence against Tinic's results. They claim that Tinic's findings are difficult to interpret since he does not take into consideration the variability of initial returns over time. Drake and Vetsuypens (1993:64) compared the underpricing of sued companies to that of matched non-sued companies and found that the underpricing of sued companies was higher than that of comparable non-sued ones. Likewise, Ritter (1998) upholds that underpricing an IPO is a very costly way of reducing the probability of a future lawsuit.

3.3.1.7. Investment banker's monopsony of power hypothesis

According to Christiansen (2011:34) other theories that do not rely on information asymmetry is based on the theory on the investment banker's monopsony of power hypothesis (Baron & Holmstrom, 1980). Based on this theory, underwriters usually take advantage of their superior knowledge of market conditions to underprice the offerings, which allows them to ingratiate themselves with buy-side clients for new issues. Ibbotson and Ritter (1995) note that this theory is based on information asymmetries between issuing companies and their investment bankers. This model also assumes that underwriters use the monopsony power they have to distribute underpriced IPOs to their favoured customers. Studies by Cornelli and Goldreich (2001) in the UK and Aggarwal, Prabhala and Puri (2002) in the US are in support of the predictions of this theory and thus conclude that underwriters favour institutional investors on the allocation of shares. However, other research by Field and Sheehan (2002) opposed this idea and showed that "underpricing has little or no effect on outside block ownership".

In conclusion, after having examined the theories on the possible explanations for the underpricing phenomenon, it becomes evident that all the explanations on underpricing occur

as a result of information asymmetry on the part of the uninformed investors and or by underwriters trying to keep up to their end of a bargain on the firm commitment. The uninformed investors usually have limited information about the issuing company prior to going public. As a result, in order to entice the uninformed investors to buy all the shares, the underwriters underprice the shares so as to compensate the uninformed investor. Consequently, some of the uninformed investors will either get a fraction of the most desirable issues, or be allocated with most of the least desirable issues. Moreover, the uninformed investors usually make investment decisions based on the decisions of other investors on the market. If there is a trend showing that a lot of investors purchase a particular share, uninformed investor might also buy it though it would never happen based on his/her own analysis. Conversely, uninformed investors will not buy shares if they observe that other investors are not buying the shares even when they have favourable information about the company.

The underwriters on their part usually make a decision between firm commitment and best effort commitment when accepting a company for initial listing. Based on the firm commitment arrangement, underwriter agrees to buy all issues shares, irrespective of their abilities to sell them at a particular price. A best efforts contract requires the underwriter to buy only enough shares to fill investor demand. Based on this arrangement, the underwriter takes no responsibility for unsold shares. In the case where underwriters agree to the firm commitment, they will do everything in their power to ensure they sell the shares seeing that their reputation depends on the success of the issue. Thus, they underprice the shares in order to entice the uninformed investors to buy all the shares.

Based on the explanations on underpricing, it becomes imperative to find out what happens to the long run performance of these underpriced stocks as well the possible explanations accounting for the long run underperformance, in order to provide a complete explanation and understanding of the IPO market anomalies.

3.4. LONG RUN UNDERPERFORMANCE

Yuhong (2010:2) asserts that long run underperformance means that "relative to other companies, investors appear to lose out by continuing to hold the shares of a company that have recently gone public". Liu (2009:76) defines the long run underperformance of IPOs as the negative average returns over a long period of time after the issue. According to Lijun

(2006:6), the long run underperformance of IPOs is one of the hotspots in the IPO fields. There has been extensive evidence of long run underperformance in IPO markets all over the world, ranging in magnitude across different markets (Govindasamy, 2010:1; Karlsson & Sköld, 2006:4). Santos (2011:7) provides evidence that IPOs tend to underperform in a three to five year period subsequent to the listings. Drobetz, Kammerman and Wälchli (2005:271) examined the long run performance of 109 Swiss IPOs from 1983 to 2000 and found that after three years, the underperformance was only about 7.5% using a broad market index as the benchmark and increased to 21% after four years and to 101% after ten years. Goergen, Khurshed and Mudambi (2007) studied the performance of 252 IPOs that were listed on the London Stock Exchange from 1991 to 1995 and observed that over the first 36 months, the average returns were -21.3%. Likewise, similar studies by Govindaamy (2010:1) on the JSE, when using the buy and hold abnormal return (BHAR) and cumulative abnormal return (CAR) methods, established that IPOs underperformed the market by 50% and 47% for BHAR and CAR respectively. Bessler and Thies (2007) examined the long run performance of German IPOs for the period of 1977 to 1995 and established that they had an average return of -12.7% for a period of three years when using the BHAR. Likewise, Jaskiewicz, González, Menéndez and Schiereck (2005) using a sample of 153 companies over the period of 1990 to 2001 showed a BHAR of -32.8% over three years. Moreover, other studies by Kirkulak (2008) on the Japanese IPO market between 1998 and 2001 showed a long run underperformance of 18.3% over three years using a sample of 433 companies. Further evidence of the long run underperformance was provided for China by Cai, Liu and Mase (2008), using a sample of 335 companies revealed a BHAR of -29.6% over a three years period. Nevertheless, other studies by Corhay, Teo and Rad (2002) observed that Malaysian IPOs outperformed the market over a period of 1992-1996, with a substantial positive CAR of 41.7% over three years from their listing day. However, evidence of long term underperformance is dominant in most developed markets but with a notable exception in Malaysia.

3.4.1. Explanations on underperformance

Many theories have been put forth in an attempt to explain the issue of long run underperformance. For example a study by Karlsson and Sköld (2006:4) divided the long run underperformance of IPOs into three subgroups; behavioural, asymmetric information and efficient market theory explanations. Explanations based on behavioural finance include the divergence of opinions hypothesis by (Miller, 1977); the impresario or fads hypothesis by

(Shiller, 1990); and the window of opportunity hypothesis by (Loughran *et al*., 1994). Explanations based on asymmetric information include; the earnings management hypothesis by (Friedlan, 1994); the overestimate hypothesis and the signalling hypothesis. Explanations based on the efficient market theory include; the mis-measurement theory by (Krushed *et al.,* 1999) and the pseudo market timing hypothesis by (Schultz, 2000). For the purpose of this study, the theories for explaining the long run underperformance will be discussed based on the fads hypothesis, the overestimate hypothesis and the earnings management hypothesis.

3.4.1.1. Explanations based on the fads hypothesis (impresario hypothesis)

According to Ritter (1991:4) there are periods in which investors tend to be overoptimistic about the earnings potential of companies, and he terms these periods' fads. Rhee (2002:100) defines fad as a temporary overvaluation caused by over-optimism on the part of investors. Because investors are usually irrationally over optimistic when trading starts, companies are usually able to distinguish periods when investors are optimistic and chose to go public when the market is giving them a more favourable valuation i.e. capturing a window of opportunity. Lijun (2006:17) maintains that the behavioural finance explanation advocates that share prices are subject to fads and managers and investment banks time the market to issue shares when it is overpriced, and as such, investors never figure out managers are taking advantage of them. Further evidence is provided by Rajan and Servaes (1994) who studied the market conditions on IPOs and established that more companies go public when other companies in the same industry are trading at high multiples (price-earnings or market-to-book reflecting optimistic assessments of the net present value of growth opportunities), with the intention of getting a high compensation.

However, when this temporal over optimism finally fades, the newly floated companies will not be able to meet up with its expectations and hence underperform the market in the long run. Moreover, Shiller (1990) used the impresario hypothesis to explain the poor long run performance of IPOs. The impresario hypothesis advocates that the IPO market is subject to fads and that underwriters act as the "impresarios" stimulating the issue. Consequently, underwriters usually underprice the new issues to create the appearance of excess demand, so as to attract investors. The high initial return is an indication of investors' over optimism and overreaction towards the share. However, as time goes by and the company's information is gradually revealed, investors will correct their opinions. The predictions of this hypothesis is

that companies with the highest initial returns will have the lowest future returns and the size of underperformance will be expected to be positively related to the degree of underpricing. Carter and Manaster (1990) remark that companies having higher initial returns tend to provide lower long run returns than companies having lower initial returns (level of underpricing). Nevertheless, studies by Bossaerts and Hillion (1998) questioned the irrationality in the IPO market. They tested whether long run underperformance is a reflection of initial over optimism or the failure amongst investors in the aftermarket to learn. They come to the conclusion that the reason for underperformance is rather that the initial expectations are overly optimistic than the inability amongst investors to learn and that investors have different behavioural patterns in low priced offer.

3.4.1.2. Explanation based on the overestimate hypothesis

Lijun (2006:20) states that the overestimate hypothesis advocates that companies will predict their future earning based on information available in the prospectus. Because the share price predictions are based on the anticipation of the company's future activities, analysts' predictions are valuable for investors. Predicting information included in the prospectus also helps to reduce information asymmetry in the IPO market. Lijun further observed that because profits are projected by analysts and company managers; analysts' predictions are sometimes optimistic, while companies managers are either too confident in their own companies or are happy to accept optimistic predictions in order to attract more investors. A similar observation is made by Rajan and Servaes (1997) who provided empirical evidence that new shares with high initial returns usually gain more attention from market analysts. Consequently, analysts usually tend to overestimate companies' prospects and profitability. When these optimisms spread across the whole security market, it will increase the listing of new equities.

3.4.1.3. Explanation based on the earnings management hypothesis

Lijun (2006:19) asserts that investors usually build their expectations for future earnings level and risks based on the company's past performance. Due to limited information about the issuing company prior to going public, investors usually judge the company's real value based on information contained in the prospectus or road shows where verbal earnings projection are made about the company. Cormier and Martinez (2005:3) state that in order to reduce the problem of information asymmetry, managers usually send credible signals about the earning prospects of their companies to the public. The main source of information comes

from the financial statements presented in the prospectus. Jog and McConoomy (2003) examined the role played by voluntary inclusion of earning forecast in the valuation of IPOs, and established that voluntary earnings forecast disclosures are relevant and have noticeable impact on the degree of information asymmetry. However, as information is gradually revealed by the media and subsequent financial reports, investors notice that the earnings are not maintaining momentum and thus lose their optimism. Chaney and Lewis (1998) demonstrated that most companies managing earnings at the time of offering only care about the short run benefits, and thus they perform worse after the IPO. Conversely, findings by Kamel (2012:1) establish that pre-offering accruals do not explain the post-offering underperformance in earnings but predicts a portion of the subsequent poor share returns performance.

In conclusion, from the literature on the possible explanations for the long run underperformance phenomenon, it is observed that the long run underperformance can be explained by the irrationally over-optimism of investors. Given that there is usually limited information prior to going public, investors usually judge the company's real value based on the company's past performance contained in the prospectus. However, when this temporal over optimism finally fades and the company's information is gradually revealed, the newly floated companies will not be able to meet up with its expectations and hence underperform the market in the long run.

Furthermore, when comparing the theories on underpricing to those of long run underperformance, it is seen that underpricing and long run underperformance can be explained more by information asymmetry and investors over-optimism than the deliberate underpricing by underwriters. However, what is more noticeable is that the issue of initial underpricing and long run underperformance of IPOs seem to be applicable to most stock markets around the world. These IPO anomalies make it extremely difficult for investors to initially select successful IPO companies from failed ones, which raise the need and importance for this study

3.5. CHAPTER SUMMARY

This chapter began by making a distinction between absolute and relative returns, where it was recommended that investors should focus on both absolute and relative returns as both strategies when combined provide a more attractive risk to return profile. Thereafter, this

study examined initial abnormal returns (underpricing). Literature studies showed that IPOs on average have a high initial return on the first day of trading. It was also evident that underpricing is one of the most prominent abnormalities that have been acknowledged in most financial markets, irrespective of the time period investigated. This necessitated the need to find possible explanations for these high initial returns. Theories such as the winner's curse, the bandwagon effect, the signalling hypothesis, the ownership dispersion hypothesis, the leaving a good taste hypothesis, the lawsuit avoidance hypothesis and the investment banker's monopsony of power hypothesis were provided as explanations for the occurrence of these high positive abnormal returns at the end of the first trading day, the first trading week or the first trading month. From these theories, it was established that all the explanations on underpricing occur as result of information asymmetry on the part of the uninformed investors and/ or by underwriters trying to keep up to their end of a bargain on the firm commitment

Subsequently, existing theories and concepts on long run underperformance were examined. Based on the literature, it was established that IPOs tend to underperform the market in a three to five year period subsequent to the listings. Theories such as the fad hypothesis, the overestimate hypothesis, and the earnings management hypothesis were used as explanations for the occurrence of long run negative returns (underperformance). Based on the literature on the possible explanations for the long run underperformance phenomenon, it is observed that the long run underperformance can be explained by the irrationally over optimism of investors. Moreover, when the theories on underpricing and long run underperformance were compared, it was established that underpricing and long run underperformance can be explained more by information asymmetry and investors over-optimism than the deliberate underpricing by underwriters. Furthermore underpricing and long run underperformance of IPOs were found to be applicable to most stock markets around the world and thus accounted for why investors found it extremely difficult to initially select successful IPO companies from failed ones. This necessitates the need to examine the success and failure patterns of IPOs in attempting to improve the IPO selection process and minimise the problem of asymmetric information.

CHAPTER FOUR

THEORIES AND CONCEPTS ON IPO SUCCESS AND FAILURE

"The death of firms is central to the creation/destruction process in a capitalist economy and to the investors' wealth. According to Baker and Kennedy (2002), without the economic grim reaper, productive resources (physical, intangible, and human) would be less likely to move to higher-valued uses or into the hands of better managers. Economic development depends on innovation and the reallocation of productive resources. While some firms are able to reconfigure their assets and strategies to adjust to changing technology and tastes, many are not" (Djama, Martinez and Serve, 2011:12)

4.1. INTRODUCTION

For investors, an IPO market presents both an immense profitable opportunity and tremendous risks. Recent studies document a dramatic decline in the survival and success rates of newly listed companies. Also, an extensive rise in IPO failures and the high tendency of IPO delisting occurs within a few years of issuance. In this regard, one can well imagine that investors in IPOs would suffer huge losses with the declining performance or even failure of the newly listed companies. As such, it becomes a great concern to investors, existing shareholders and companies as they try to find methods to forecast and predict financial crises and prevent the loss of their original investment. Success and failure prediction models help investors to distinguish between ideal opportunities for investment as well as adverse situations. It also act as an alarm, disclosing any distress in a financial structure, and thus make it possible for investors, existing shareholders and companies to react in a timely manner.

This chapter commences with a brief introduction on the need for exploring existing theories and concepts on IPO success and failure models. Subsequently, the theories and concepts on IPO success are examined. Thereafter, the theories and concepts on IPO failures are discussed in detail.

4.2. THEORIES AND CONCEPT ON IPO SUCCESS

A "successful IPO" or a "market outperformer" is viewed by Ernest and Young (2008:3) as one in which the stock price of the newly-listed company outperformed its stock exchange or

major regional index in the three years following the IPO. Bach, Judge and Dean (2008:508) define IPO success as the creation of market value above and beyond the resources invested in the venture since its inception. Ernest and Young (2008) views IPO success from an investor's perspective as when the shares of an IPO three to five years into an IPO have rewarded a positive risk-return trade-off to an investor. Labbe and Feucht (2007) note that successful IPOs can also be seen when a company that goes public ends up in the right market at the right price, which involves a level of underpricing as low as possible. Various studies have put forth competing theories and concepts regarding IPO success and its measurement criteria (Beatty & Ritter 1986; Hanley 1993; Bach *et al*, 2008:510). These studies have identified a number of theories to explain IPO success such as initial mispricing, capital market success, superior knowledge and IPO success. More detailed explanations of these theories are provided below;

4.2.1. Initial Mispricing

Trinugroho and Rinofah (2011:15) define mispricing as a condition in which the value of shares in the capital market is different from its fundamental value. Reber and Fong (2006:3) assert that the explanation to initial mispricing is a result of a winner's curse and adverse selection problem, whereby the shares are underpriced in order to compensate the uninformed investors for a bias in being allocated a higher proportion of overpriced offerings and to encourage the uninformed investors to participate in the IPO market (Rock, 1986). McKenzie and Takaoka (2008:3) point out that the two standard explanations for mispricing are the excessive competition between underwriters and the existence of asymmetric information between investors and issuers. Sadka and Scherbina (2007) elucidate that mispricing arises as a result of the disagreements among the analysts associated with the transaction costs or the liquidity of the stock. Alzahrani, (2006) further established that mispricing is caused by the presence of asymmetric information between manager and investor, as well as the bias of investor assessment. Achua (2010:3) stress that mispricing is caused by either setting the offering price too low or the investors overvaluing the IPOs on the first trading day.

To measure IPO success, the existing literature uses initial mispricing (Beatty and Ritter 1986; Hanley 1993). Reber and Fong (2006:3) assert that initial mispricing is measured as the difference between the offer price and market price at the end of the first trading day. According to Rhodes, Robinson and Vishwanathan (2004) mispricing can be measured by breaking down the market to book value into two components, mispricing component and the

growth opportunities component. Trinugroho and Rinofah (2011:16-17) in their study measured mispricing by comparing the predicted value of market to book value (M/B Pre) with the actual value of the market to book value (M/B Act). This formula is based on the argument that the actual market to book value should reflect the company's fundamental factors such as earning per share (EPS), price earnings ratio (PER), return on equity (ROE), return on assets (ROA), dividend payout ratio (DPR), price to sales (PTS), and price to free cash flow (PTFCF). This formula is given by

Mispricing (MIS) = (M/BAct) - (M/BPre)

Where

$\textbf{M/B}_{\textbf{Pre}} = \alpha_0 + \beta_1 EPS_{t-1} + \beta_2 PER_{t-1} + \beta_3 ROE_{t-1} + \beta_4 ROA_{t-1} + \beta_5 DPR_{t-1} + \beta + \beta + \varepsilon$

EPS = Earnings per share (Net income/shares outstanding)

PER = Price earnings ratio (Market stock price/EPS)

ROE = Return on equity (Net income/equity)

ROA = Return on asset (Net income/total asset)

DPR = Dividend pay-out ratio (1-Plowback ratio)

PS = Price to sales (Market stock price/ (sales/shares))

PFCF = Price to free cash flow (Market stock price/ (Free Cash Flow/shares outstanding))

While the actual value of market-to-book will be calculated by following formula:

$$\textbf{M/B}_{\textbf{Act}} = \frac{\text{Market value of share}}{\text{Book Value of share}}$$

The importance of mispricing in IPO success is that an excessively first day jump indicates that the IPO will be unsuccessful in the long run (Loita capital partners international, 2006:1). Additional support of mispricing comes from a survey carried out by Graham and Harvey (2001) where executives highlight the importance of mispricing in equity issuance. Brav, Graham, Harvey and Michaely (2005) laid emphasis on the importance of mispricing to executives in their repurchase decision. By way of contrast, studies by Jung, Kim and Stulz (1996) find little support for mispricing. DeAngelo, DeAngelo and Stulz (2010) argue that businesses issue seasonal equity offerings (SEOs) to overcome liquidity issues and not mainly to exploit mispricing.

4.2.2. Capital market success

 According to Berger and Hinz (2008) IPO success is usually measured either using the capital market success. The capital market success takes in to consideration the capital market

effects (reflected in stock price development) or the fundamental effect (reflected in financial reporting). Depending on the intended use, studies by DeGeorge and Zeckhauser (1993) used a combination of capital market and fundamental development for a holistic evaluation of IPO success. Berger and Hinz (2008) maintain that IPO success can be measured based on the capital market success, which takes into consideration the development of stock prices after 180 days / 360 days (Bessler & Kurth, 2007; Luca & Carola, 2007). IPO success is then interpreted as the abnormal returns of the specific share according to the market adjusted returns model. The market adjusted returns model assumes that the ex-ante expected returns are the same for all shares and thus are equal to the expected market return in that period. The IPO abnormal returns is then calculated using the BHAR separately for the two time periods (180 days, 360 days) as well as including and excluding the first day returns.

4.2.3. Superior Knowledge and IPO success

Sambamurthy and Subramani (2005) view knowledge as a fundamental asset for companies in an increasingly knowledge-based global economy. According to Teece, Pisano and Shuen (1997), a company's ability to create, acquire, and incorporate knowledge has emerged as a critical organizational capability. Jacobson (1992:787) propounds that the "existence of true entrepreneurial profit depends upon the possession of superior knowledge". Shane (2000) elucidates that diverse pools of knowledge allow entrepreneurs to discover market opportunities and thus facilitate the discovery of entrepreneurial opportunities. Hence, under this construct Bach *et al.* (2008) theoretically assumes that the salient knowledge within a company is embedded within the top management team since they are usually viewed as a reflection of the entire organization. Investors usually assume that the top management team is a realistic proxy for superior knowledge possessed by the overall company. Cohen and Dean (2005) assert that top management team (based on members' industry experience, the level of education and age) are generally considered as a very legitimate source of market signals. Consequently, an IPO is viewed as a means through which investors assess the expertise and competence of the top management team, and thus theorize that IPO success is predicted by the superior knowledge possessed by the top management team of the entrepreneurial company. However, Zahra and Filatotchev (2004) argue that there is little conclusive knowledge and information as to how entrepreneurial companies will obtain information advantages and how those advantages will influence the economic value created as they go public.

4.2.4. Other Theories - specific characteristics of the business

Other theories and concepts on IPO success are related to specific characteristics of the business. With respect to the specific characteristics of the business that might affect a business success, Jain, Jayaraman and Kini (2008) established that an increase in the, number of employees, company's age, pre-IPO investor demand and governance considerations are linked with a higher probability of success (measured by post-IPO profitability). Carpentier and Suret (2009) found that the main indicators which are associated to a company's survival and success propensity are profitability, market capitalization and stock prices. Yap (2009:5) further established that IPO success is measured by focusing on the post-IPO long term performance and that the determinants of IPO success are the offering size, underwriter reputation and the clustering of filings. Furthermore, Field and Lowry (2009: 490) observed that IPOs with greater institutional shareholding outperform those with smaller institutional shareholding, and that in order to avoid underperformance, investors should invest in businesses that have a positive earnings prior to the IPO. In addition, Klein and Mohanram (2006) showed that businesses that exceed the profitability standards have high long run returns and a low probability of being delisted. These researchers further indicated that businesses that had positive earnings, institutional interest, venture capital involvement and management quality experienced superior performance.

The above literature proposed that there exist a number of different ways in which IPO success can be measured. The literature revealed that there are various theories such as initial mispricing, capital market success, superior knowledge and IPO success and other theories relating to the specific characteristics of the business that can be used to predict IPO success. All these approaches take in to consideration the development of stock prices and/ or specific characteristics of a business (age, the level of education, size, market capitalization, underwriter reputation and post-IPO long term performance and profitability). Amid the most widely used IPO success measures are post-IPO long term performance and profitability which researchers (Ritter, 1991; Orman, 2005; Wilbon, 2003) suggest to be a strong measurement of IPO success.

4.3. THEORIES AND CONCEPTS ON IPO FAILURE

IPO failure is often defined as the delisting of a company from the primary exchange on which it traded with a delisting code between 500 and 585 (Foster-Johnson, Lewis and Steward, 2001). The delisting codes are codes that indicate the reason a company is delisted

from the stock exchange. Codes between 500 and 585 indicate issues relating to bankruptcy, inability of a company to maintain minimum size, shareholder number and/or stock price requirements for continued listing on the stock exchange (Fischer & Pollock, 2004:470). Burhop and Chambers (2010:10) view IPO failure as a liquidation with shareholders receiving little or no return on their investment usually due to the poor quality of the IPO. IPO failure is defined by Fischer and Pollock (2004:470) as the delisting of a company from the primary exchange either because of bankruptcy or inability of a company to maintain minimum requirements. Wruck (1990) defines failure by financial criteria as the lack of sufficient cash flows to satisfy current obligations. Gaughan (2011) views failure as the inability of a company to meet its current obligations as they come due. These obligations might include outstanding debts to suppliers and employees, incurred losses from on-going legal processes, and defaults in repayment of principal and interests. IPO failure is also viewed as the poor returns earned relative to the risk of undertaking the investment (Raputsoane, 2009:1). Altman and Hotckiss (2005) stress that failure by economic criteria means that "the realized rate of return on invested capital, with allowances for risk consideration, is significantly and continually lower than prevailing rates on similar investments". Gaughan (2011) reckons that the decision of continuance of operations depends on expected returns and the ability of the firm to cover variable costs. Various studies proposed competing theories and concepts on IPO failure and its measurement criteria (Campbell, Hilscher, & Szilagyi, 2004; Beaver, McNichols, & Rhie, 2006). These studies have identified a number of theories to explain IPO failure such as accounting based bankruptcy prediction model, the market's pricing of distress risk and Gambler's Ruin Model amongst others. More detailed explanations of these theories are provided below;

4.3.1. Accounting-based bankruptcy prediction model

Accounting-based bankruptcy prediction models take into consideration a company's past performance as a base for predicting a business future likelihood of survival (Xu & Zhang, 2009). The literature studies on bankruptcy prediction dates back to the 1930's when initial studies used ratio analysis to predict future bankruptcy (Bellovary, Giacomino & Akers, 2007:1). These models for bankruptcy predictions are functions of using financial ratios to predict the continuation or termination of the activities of a business. Examples of these studies include those carried out by Beaver (1966), Altman (1968), Ohlson (1980) in the United States, Wood and Piesse (1987), Inman (1991) in the United Kingdom and Cybinski (2001) in Australia. Beaver (1966) applied a t-test to assess the importance of individual

accounting ratios within a similar pair-matched sample. Altman (1968) used financial data (earnings before interest and tax to total assets, working capital to total assets, book value of equity to book value of total debt and retained earnings to total assets) for both bankrupt and non-bankrupt companies of their fiscal years before bankruptcy as independent variables in the Z-Score model. Altman's model predicted a financial crisis with an accuracy rate of 95% in the year before such a crisis happened. Springate (1978) used auditing analysis to distinguish bankrupt companies from non-bankrupt companies by selecting four financial ratios (the ratio of working capital to total assets, the ratio of net profit before imposing interest and tax to total assets, the ratio of net profit before imposing tax to the current debts, and the ratio of sales to total assets) among nineteen ratios. Springate tested this model on forty manufacturing companies, and established that they had an accuracy rate of 92.5% to predict bankruptcy.

In addition, Farajzadeh (2007) developed a model to predict bankruptcy for companies in the Tehran stock exchange, using financial ratios such as the ratio of quick assets to total assets, the ratio of sales to current assets, the ratio of operating profit to sales, the ratio of total debts to total assets, and the ratio of interest costs to gross profits. He used 72 bankrupt companies and 72 non-bankrupt companies, and observed that the model was able to predict with an accuracy rate of 94%. Moreover, Fitz (1932) compared 13 ratios from failed and successful companies and established that while successful companies displayed favourable ratios, the failed companies had unfavourable ratios when compared with "standard" ratios and ratio trends. Friz also found that net worth to debt and net profits to net worth are the two significant ratios which can be used in predicting a business failure and that less importance should be placed on the current ratio and quick ratio for businesses with long term liabilities. Smith and Winakor (1935) examined the ratios of 183 failed companies from a wide variety of industries and found the working capital to total assets to be a better predictor of financial problems than both cash to total assets and the current ratio.

Agarwal and Taffler (2006:2) identified some criticism on the accounting-based model. Firstly, accounting statements indicates the past performance of a business which may or may not be informative in predicting the future. Secondly accounting numbers are liable to manipulation by management. Thirdly, conservatism and historical cost accounting means that the true asset values of a business may be very different from the recorded book values. Additionally, Hillegeist *et al*. (2004) propound that given the accounting statements are

prepared based on a going-concern basis, they however are by design of limited utility in predicting bankruptcy and IPO failure.

4.3.2. Market-based bankruptcy prediction models

According to Xu and Zhang (2008), the market-based bankruptcy prediction model uses market variables (market prices) to depict the future performance of a business. Christidis and Gregory (2010:11) consider the market price to be a useful indicator that integrates the information learnt from financial statement released by the company alongside other information available in the market. Rees (1995) propound that the market price is a valuable predictor of failure and that it does not only provide a wide variety of information related to the expected future cash flows but it also discloses a subset of information about the likelihood of liquidation and cash flow impact. Hence, a sharp fall in the market price might be viewed as a warning.

Furthermore, the market based variables for bankruptcy prediction follows an option pricing theory proposed by Black and Sholes (1973) and Merton (1974) that expresses the probability of bankruptcy occurring to depend on the volatility between the market value of the assets and the strike price (value of debt obligations). This theory identified the critical level where a business will default to occur when the worth of company's assets moves below a certain level (debt obligations) but fails to take into consideration any incremental information when the market is in a semi-strong form. Christidis and Gregory (2010:11) found that the market-based variable most typically used in previous research is the firm size which is measured by market capitalisation. Batta and Wongsunwai (2010:5, 20) point out that the market variables considered in the market-based model are; LERET, LSIGMA, the excess return of a share over the market measured over a 12-month period, the natural logarithm of the market capitalization of the company's stock divided by the total market's capitalization and the standard deviation of residuals from regressions of the past 12 months' stock returns on market returns, and LRSIZE. LERET is defined as the company's return less the market index, LSIGMA is defined as the lagged twelve-month return volatility, and LRSIZE is defined as the logarithm of a company's market capitalisation relative to the aggregate sample market capitalisation (Maffett, Owens and Srinivasan, 2013:10).

The LSIGMA and LRSIZE variables have been identified to have a lower weight in predicting bankruptcy when business-quarters are under-valued. Other studies (Hillegeist,

Keating, Cram, & Lundstedt 2004; Vassalou & Xing, 2004; Reisz & Perlich, 2007) have also used market based variables to predict the default probability of a business. Reisz and Perlich (2007) examined the default probability of 5,784 industrial companies by using both market and accounting based approaches, and concluded that the accounting-based measure outperforms the market based approach. Hillegeist *et al.* (2004) compared the market based approach with some accounting based approaches (multivariate discriminant analysis and logit) and concluded that the market based approach provided considerably more information about the default probability of a business comparatively to the accounting-based approach.

Agarwal and Taffler (2006:2) assert that the market-based approach counters most of the criticisms of accounting-ratio-based models by providing a sound theoretical model for a company's bankruptcy. Also, market variables are unlikely to be influenced by business accounting policies. Moreover, the market prices reflect future expected cash flows which are appropriate for prediction purposes. In addition, the market based approach is not time or sample dependent. Likewise, Beaver, McNichols and Rhie (2005:115) found that replacing accounting measures of book value with market measures in financial ratio denominators helps to improve the failure predictive power by making the information more timely. Hillegeist *et al*. (2004) advocate that the market-based model carries more information about the probability of bankruptcy than poor performing accounting-ratio based models. Conversely, Campbell, Hilscher and Szilagyi (2006) maintain that the limitation of the market-based model is that it has little forecasting power after controlling for other variables.

4.3.3. Gambler's Ruin Model

According to Jacobs (2007:44), the Gambler's run model is most likely to occur when a company's net liquidation value (NLV) becomes negative. The net liquidation value is the total asset liquidation value less total liabilities. A company's NLV is increased by cash inflows and decreased by cash outflows from one period to the next. Wilcox (1971) postulate that a business risk of failure is based on the NLV and the size of the company's adjusted cash flow of risks at each period. Wilcox (1973) further tested this theory on a sample of matched pairs of 52 failed companies and 52 non-failed companies from one to five years prior to failure, based on their size and industry characteristics. Vinso (1979) extended the Wilcox's gambler's ruin model to develop a safety index that can be used to predict the point in time when a company's failure is most likely to occur. Jacobs (2007: 46-47) states that an advantage of the gambler ruin's model is that it specifies the mathematical function to be

employed. Also, a potential disadvantage of gambler ruin's model is that its supporting assumptions may not be satisfied.

To conclude, the above review has provided an in-depth explanation on the models that can be used to predict IPO failure. All of these models use market price and/ or accounting financial data (earnings before interest and tax to total assets, working capital to total assets) as valuable predictors of failure. However, most studies (Agarwal & Taffler, 2006:2; Beaver, McNichols & Rhie, 2005:115) have questioned the use of accounting-based models in predicting IPO failure. These authors argue that accounting variables may not be informative in predicting the future and are also liable to manipulation by management. Market variables on the other hand are unlikely to be influenced by business accounting policies and reflect future expected cash flows which are appropriate for prediction purposes. Hence, it is imperative for investors, existing shareholders, companies, auditors, managers, lenders, and analyst to use on both accounting and market variables they struggle to find methods to predict financial crises and prevent the loss of their original investment. Bellovary, Giacomino and Akers (2007: 12) reckon that the empirical tests of most of these models show high predictive ability.

4.4. CHAPTER SUMMARY

This chapter examined concepts and theories of IPO success and failure. Starting with a review on the approaches to IPO success, the literature revealed that there are various theories such as initial mispricing, capital market success, superior knowledge and IPO success and other theories relating to the specific characteristics of the business can be used to predict IPO success. Also evident is that all of these approaches take in to consideration the development of stock prices and/ or specific characteristics of a business (age, the level of education, size, market capitalization, underwriter reputation and post-IPO long term performance and profitability). Amid the most widely used IPO success measures are post-IPO long term performance and profitability which researchers (Ritter, 1991; Orman, 2005; Wilbon, 2003) suggest are a strong measurement of IPO success.

With regards to IPO failure models, theories such as accounting based bankruptcy prediction model, the market's pricing of distress risk and Gambler's Ruin Model, were identified as models that can be used to predict IPO failure. All of these models use market price and/ or accounting financial data (earnings before interest and tax to total assets, working capital to

total assets) as valuable predictors of failure. However, most studies (Agarwal & Taffler, 2006:2; Beaver, McNichols & Rhie, 2005:115) have questioned the use of accounting-based model in predicting IPO failure. These argue that accounting variables may not be informative in predicting the future and are also liable to manipulation by management. Market variables on the other hand are unlikely to be influenced by business accounting policies and reflect future expected cash flows which are appropriate for prediction purposes.

When comparing the IPO success models to that IPO failure models, it is observed that while the IPO success models place emphasis on stock prices and/ or specific characteristics of a business, the IPO failure models focus on market price and/ or accounting financial data. Hence, it is imperative for investors, existing shareholders, companies, auditors, managers, lenders, and analyst to use on both the IPO success and failure predictor variables since they are interlinked (i.e. in predicting IPO success, they will be indirectly predicting IPO failure and vice versa).

CHAPTER FIVE

DETERMINANTS OF IPO RETURNS AND IPO SUCCESS AND FAILURE

"Several questions regarding the survival of IPOs and its determinants need to be answered, namely: do these surviving firms have a specific profile? Do they share common features? Can one determine the profile of surviving IPOs based on their observable characteristics at the time of IPO? What factors at the time of the issue can forecast whether the firm survives, is acquired or dies?"(Boubakri et al., 2005: 3).

5.1. INTRODUCTION

After examining the theoretical concepts on IPO returns and existing literature on IPO success and failures on various stock markets in chapter three and four respectively, this chapter integrates chapter three and four by examining the IPO characteristics which act as determinants of IPO returns (short and long run) and IPO success and failure. Finally, a conclusion is drawn based on the overall chapter discussion.

5.2. IPO CHARACTERISTICS

Several studies (M'kombe & Ward, 2002:10; Hughes & Lee, 2006:5, Sohail & Raheman, 2009:63; Sahoo & Rajib, 2010:27; Durukan, 2002; Demer & Joos, 2006:17; Carpentier & Suret, 2007:2) have identified characteristics of IPO companies such as the company's age, timing of issue (hot and cold market periods), issue size, profitability, market capitalisation, offer size, gross proceeds, leverage, price to book value (P/B), market to book value (M/B), financial ratios, pre-IPO performance, and technical riskiness (measured by sector and R&D intensity) to be significant determinants of IPO returns and the success and failure of IPOs. In this study, IPO characteristics are classified into firm specific characteristics (gross proceeds, company's age and industry); issue related characteristics (initial share price movement and IPO market periods); market related characteristics (P/E and M/B) and pre-financial ratios.

5.2.1. Firm characteristics

The firm specific characteristics identified are gross proceeds, company's age and industry.

5.2.1.1. Gross proceeds (Size of the IPO)

The size of the issue (offer price and number of shares) is the magnitude of the offering, which is calculated as the product of the number of shares issued and the offer price (Gounopoulos, Nounis & Stylianides, 2008:10). The size characteristics have been recognized widely as important determinants of IPO returns (short and long run returns) and the success and failure of IPOs. For example, Kooli and Suret (2002:20) found that underpricing decreases with the size of the issue and further elucidated that small IPOs are usually more underpriced than larger IPOs. Kumar, (2007:24) reported that the size of the issue had an inverse relationship signifying that an increase in issue size reduces underpricing. Also, Deb and Vijaya (2010: 2299) reported that the issue size had a negative impact on the level of underpricing; suggesting that a large issue size increases the supply of IPO shares, and thus results to lesser underpricing. These findings indicate that the smaller the size of the issue, the higher the level of underpricing. It is now important also, to evaluate the impact of the size of the long run performance.

Drobetz, Kammerman and Wälchli (2005:273) found that the underperformance of IPOs was due to the size of the companies. Govindasamy, (2010:57-58) also established in that companies with smaller gross proceeds had higher levels of underperformance in the long run than larger companies. Goergen, Khurshed and Mudambi (2007:401) also established from their study of IPOs in the UK that small firms suffered from a greater level of underperformance than larger firms. Further evidence was provided by Vithessonthi (2008) which indicated that IPOs with the smallest size showed the worst long run performance. This finding suggest that the larger the offer size, the lesser the level of underpricing and the worse off the long run performance. However, contrary to these studies, Kaya (2012:73) observed that the performance of IPOs does not differ based on firm size. Allen, Morkel-kingsbury and Piboonthanakiat (1999:223) observed that smaller issues had the tendency to perform better than the larger issues in the long run. Also, Cai, Liu, and Mase (2008) observed that the larger the offer size of IPOs the worse the long run performance was.

With respect to IPO success and failure, Kooli and Meknassi (2007:39) found that small-sized IPOs had a high failure rate of 58.23% while medium-sized IPOs were subject to a relatively high acquisition rate (45.24%) and that the size of an IPO was negatively correlated to the failure rate, and positively related to the survival rate. Chou *et al,* (2006:14) observed in their study that failed companies on average had a smaller issuing size. Other studies by

(Carpentier & Suret, 2007:2; Demers & Joos 2006:15) established that the size of IPO was positively related to the survival rates of new issues.

5.2.1.2. Company's age

The age of the company has been considered a determinant for IPO returns by several studies (Younesi, Ardekani & Hashemijoo, 2012:141; Ahmad-Zaluki & Abiding, 2011:322). A company's age prior to going public is measured by subtracting the year in which the company was founded/ incorporated from the year it went public. Merikas, Gounopoulos and Nounis, (2009:14) found a strong relationship between a company's age and its long run performance. Likewise, Carter, Frederick and Singh (1998) established a positive relationship between a company's age and long run IPO performance.

By way of contrast, Shikha and Balwinder (2008:1) established that a company's age had no significant relationship with long run returns. His results showed that the relationship between age and returns was inconsistent as within the first three years, age showed an inverse relationship with returns, while for the fourth and fifth year, age showed a direct relationship with returns (resulting in a 'V' shaped graph over the five year period). As such it was inconclusive in determining which trend is dominant thus resulting to the conclusion that age had no significant relationship with long run returns. Kaya (2012:70) observed that younger companies in Turkey performed better within three months; older companies had their best performance at the end of six months and thus concluded that there was no significant statistical relationship between a firm's age and short term performance. Likewise, Khurshed, Mudambi and Goergen, (1999:4) did not find any statistically significant direct relationship between the age of a company and its long run performance.

Furthermore researchers (Carpentier & Suret, 2011; Demers & Joos, 2006; and Rutherford and Springer, 1997) established that younger companies experience a higher post issue failure rate and thus suggesting a negative relationship between company's age at IPO and the failure probability. Peristiani and Hong (2004:5) found a company's age to be a fairly good predictor of aftermarket survival. Hensler *et al.* (1997:109) pointed out that a company's age at the time of listing is positively related to its long run survival.

5.2.1.3. Industry

Several studies have investigated if the performance or returns from one sector or industry, differed from the returns of IPOs from other sectors or industries. For example Kiymaz (2000:218) studied IPOs listed on the Istanbul Stock Exchange between the period 1990 and 1996 and observed differences in initial returns and after market returns between the different sectors, with the initial returns for the financial sector being higher than that of industrial sector. How (2000:7, 16) established that IPOs in the mining sector are significantly more underpriced than IPOs in the industrial sector in Australia. She further observed that, in the long run IPOs in the mining sector do not perform as poorly as IPOs in the industrial sector. Allen *et al.* (1999:226) observed a wide variation in the long run performance and the underperformance in many industries in Thailand. Ritter (1991) interpreted these results as being consistent with the fads hypothesis. Moreover, Finkle and Lamb (2002) compared the long run aftermarket performance of IPOs in emerging industries (biotechnology, semiconductor and internet IPOs) to those in non-emerging industries during the period from 1993 to 1996. This study found that the returns from emerging industry after a year were worse than those of non-emerging industry, but nevertheless, the performance for both industries were negative. Contrary to the results of Finkle and Lamb (2002), Ang and Boyer (2009:606) observed that IPOs in new industries tend to declare bankruptcy less often and became delisted less often than companies conducting an IPO in established industries. However, Kaya (2012:73) found that the performance of IPOs does not differ based on industry sectors.

With regards to IPO success and failure, studies by Hensler *et al.* (1997); Demers and Joos (2006:17); Kooli and Meknassi (2007:4) and Ahmad (2012:7:17) established that IPOs in the technology sectors experienced high failure rates and low survival rates. Kooli and Meknassi (2007:4) observed that the energy and mining sector had the smallest failure rate (10.43%) and the highest acquisition rate (47.83%); while companies in the financial sectors had the highest survival rate (42.16%). Empirical evidence thus indicates that there is limited consistency regarding the effect of different industries on the outcome of IPOs.

5.2.2. Issue related characteristics

The issue related characteristics identified were initial share price movement and IPO market periods.

5.2.2.1. Market periods (Hot and Cold Markets)

It is well documented that IPO markets follow cyclical patterns with dramatic swings often called hot and cold markets (Ibbotson & Jaffe, 1975; Helwege & Liang, 2002:3). Ibbotson and Jaffe (1975) characterized an IPO market as either a hot market or a cold market and that the IPO long run underperformance can be explained by the IPO market period. The hot market issue is defined by periods of rising initial returns and increasing numbers of IPOs (Doeswij, Hemmes & Venekamp, 2006:409). This situation arises when there is a window of opportunity and IPOs are highly valued and companies take advantage of a buoyant market (Jaskiewicz, Gonzalez, Menendez & Schiereck, 2005). Prior research (Almisher, Buell & Kish, 2002; Altl, 2005:1131) has shown that the hot IPO markets are characterized by extremely high initial returns and by an extraordinarily high variability of initial returns (there is a strong positive correlation between the mean and the volatility of initial returns over time). Aggarwal (2006:17) affirms that hot IPO markets are characterized by severe underpricing, frequent oversubscription of offerings, unusually high volume of offerings, prevalence of smaller issues, and, to a certain extent, by concentrations in particular industries. In contrast, cold IPO markets have less underpricing, lower issuance, fewer instances of oversubscription, and larger offerings (Helwege & Liang, 2002:3).

Most studies on the cold and hot markets have also produced mix results. For example Helwege and Liang (2004:548) examined IPOs listed in hot and cold market periods to determine whether businesses that launched an IPO during these periods were very different in terms of the nature of their business or the newness of their industry. Findings from this study concluded that there are no dramatic differences in a company's characteristics for each market type. Also, there is no evidence of industry concentration in cold markets than in hot markets, but that IPOs listed in hot periods have disappointing long run returns, while cold market IPOs tend to outperform on a variety of benchmarks. Ibbotson and Jaffe (1975) and Ritter (1984) who pioneered the hot markets concept acknowledged the existence of underpricing in hot periods where subsequent underperformance tends to be more dramatic.

Helwege and Liang (2004:546) made a distinction between hot, cold, and neutral markets. They documented that both hot and neutral market IPOs tend to underperform the market while cold market IPOs tend to outperform the market. Helwege and Liang (2004:553) further observed that the IPOs in hot and cold periods came from similar industries and had similar characteristics. Yung, Colak, and Wang (2006:3-4) on their study in cycles in the IPO

market established that the distributions of IPO returns in hot and cold periods are substantially different. Long run abnormal returns increases substantially during hot IPO markets and that hot market IPOs have significantly higher tendency to get delisted within the first few years of being public. Using a sample of 62 IPOs on the French stock exchange for the hot period from 1999 to 2001, Derrien (2005:515) empirically demonstrated that the long run share price performance is negatively impacted by investor sentiment. Cook *et al*. (2003) established that the performance of IPOs during hot markets was worse than IPOs during cold markets.

Lawson and Ward (1998:17) found that in South Africa, two complete hot and cold market cycles occurred in the 20 year period from 1975 to 1995 on the JSE, one of which was apparent in the ten-year period from 1986 to 1995. Lawson and Ward further established that the initial returns in hot periods were significantly greater than the initial returns in cold periods using a t-test and thus concluded that the aftermarket performance of shares was significantly different for hot and cold periods on the JSE. Likewise Barlow and Sparks (1986) in their study also observed that in the period 1972 through 1986, three hot issue market cycles occurred at a frequency of approximately 9-10 years each. Lattimer (2006:123) using data from the period of 1996-1999 demonstrated the emergence of hot issue market during the course of the year 1997 and cooling down during the latter part of the 1999. With regards to the long run performance, Helwege and Liang (2004:553) highlighted in their study that hot issue IPOs resulted in poor long run performance.

When looking at IPO success and failure, Amini and Keasey (2011:14) observed that companies that went public during hot market periods had a high probability of failing in a shorter period of time than IPOs issued during the cold marker periods. Kooli and Meknassi (2007:49) established that IPO activity was significantly greater for acquired and non-surviving companies than surviving companies. Moreover, similar trends of high failure rates and low survival rates during hot market periods were also observed in several studies (Carpentier & Suret, 2007: 17; Boubakri, Kooli & L'Her, 2005: 6, Demer & Joos, 2006:17).

5.2.2.2. Initial share price movement

The question of what causes the day to day, week to week, and even month to month variations in the prices of shares have produced a mixed bag of results amongst scholars. Researchers (Schuster, 2003; Copeland, Weston & Shastri, 2005; Baker & Wurgler,

2007:129; Collett & Dedman, 2010:109) have provided a number of possible explanations for initial share price fluctuations. According to Fama (1970), the semi-strong form of the efficient markets hypothesis advocates that a company will experience a change in its share price only when the market receives news about the company. While some studies have found out that prices often move a long way without accompanying news, others have established that share price movements are often influenced by the accessibility and availability of information on the various securities being dealt with in the market (Copeland, *et al.*, 2005; Baker & Wurgler, 2007:129; Zouaoui, Nouyrigat & Beer, 2011:723; Malmendier & Shanthikumar, 2006:2; Chahine, 2004:87).

Kiweu (1991) examined share price movements on the Nairobi Stock Exchange. Using price data collected from Nairobi Stock Exchange in order to determine the behaviour of share prices, he established empirically that there were no reported patterns in share price movements. A study by Osei (2002:5) on the Ghana Stock Exchange observed an up and down drift from the market beyond the announcement week. Ryan and Taffler (2004) examined the causes of large daily share price movements in a large sample of UK companies and observed that 65% of these large abnormal share price returns were associated with publicly available information from the companies, analyst and media announcements. At the same time, Collett and Dedman (2010:109) observed that in the UK, in almost 40% of large abnormal share price returns, there was no new information that came to the market to drive the share price up. Yue (2009:20) investigated the short and long term performance of the 49 largest stocks in Hong Kong market which experienced weekly price movements of more than $\pm 10\%$ between 1999 and 2007. He found out that the share price declined when there was bad news, and increased when there was good news within two to three weeks. Moreover, in the long run large price increases were followed by negative performance. The large price declines were also followed by negative cumulative abnormal returns.

 The above explanations of share price movements create different investor opinions on the decision as when to either buy or sell a share. Miller (1977) propounds that the divergence of opinion between optimistic and pessimistic investors explains the share price path after an IPO. The subsequent effect of these fluctuations in the share price movement is that it can either lead to a positive initial day abnormal return, which may result from optimistic valuations, and/or a long run underperformance which may also be due to the arrival of information about the true value of the company.

5.2.3. Market related characteristics

The market related characteristics identified are price to earnings ratios and market to book value.

5.2.3.1. Price to earnings ratio (P/E) and Market to book value ratio (M/B)

Previous studies (Daniel, Titman. and Wei, 2001:743; Fama and French, 1992:441) have documented that M/B and P/E are important determinants of IPO returns. Brealey, Marcus and Myers (2001) pointed out that the P/E ratio is the best indicator of how investors judge the performance of different companies and market mechanism. Other studies by (Miller, 1977) and Jain and Kini (1994) employed the M/B and P/E as proxies for market expectations on the post-issue operating underperformance. Judging from the decline in the ratios of M/B and P/E post-listing, they concluded that investors tend to hold overly-optimistic expectations on the company's growth potential based on their pre-listing prosperity and then are disappointed with the decreased operating performance.

Jain and Kini (1994), comparing industry values for the US market, showed that IPO companies carry high M/B and P/E ratios at the IPO decline after the IPO. They insisted that their results suggest that investors appear to value companies going public based on expectations that earnings growth will continue, while in fact the pre-IPO earnings levels on which expectations are formed, are not even sustained. Zamanian, Khodaparati and Mirbagherijam (2013:69) showed that P/E ratio is one of determinant of abnormal long run returns of IPO in both private and public companies in Iran. Mulyono and Khairurizka (2009:49) highlighted that the M/B value had a significant impact on stock returns.

5.2.4. Financial ratios

Graham and Dodd (1934), who became known as the fathers of value investing, first advocated almost sixty years ago that taking company fundamentals into consideration when buying shares is a prerequisite for good returns. Grinblatt and Moskowitz (2004:1) established that past returns contain information about expected future returns. According to Ernest & Young (2011), investors base 60% of their IPO investment decisions on financial factors such as EPS growth, ROE, EBITDA growth, profitability, sales growth and debt to equity ratios and 40% on non-financial factors such as brand strength and operational effectiveness, quality of management, corporate strategy and execution, and corporate governance. White, Sondhi, and Fried (2003) posit that accounting literature describes

financial ratios as an excellent source to evaluate a company's risk, financial strength and operational performance. Fama and French (1992) maintain that it is profitable to buy shares trading at low prices relative to fundamentals such as earnings, assets, and dividends. Razafindrambinina and Kwan (2013:203) note that financial ratio analysis help investors in making investment decisions and predicting a company's future performance. Misnen, (2003) states that financial ratios such as the ROA, EPS, earnings growth, financial leverage and current ratio. Barber and Lyon (1996: 364) stress that the ROA is one of the most applied measure used in evaluating a company's operational performance. Razafindrambinina, and Kwan (2013:203) and Mudrik and Imam (2002) highlighted that ROA is used to assess a company's profitability. A high corporate profitability reduces uncertainty for investors to purchase the company's stocks and thus reduces the level of underpricing. Razafindrambinina and Kwan (2013:203) further state that asset turnover measures how effectively a business is using assets to generate sales. Financial leverage shows the ability of the company to pay debt with equity owned while the current ratio indicates the ability of a company to pay off its short term obligations on time. Roybark (2009) notes that the higher the level of leverage a company, the higher its level of risk and uncertainty and hence the more difficult it will be to predict the company's future.

Mulyono and Khairurizka (2009) demonstrated that financial ratios such as debt to equity ratio (DER), price to book value (PBV) and total asset turnover (TATO) have an impact on the initial returns and stock prices. Hasan and Hadad (2013:93) found that the operating profit margin and ROE had a significant relationship with initial IPO returns, while the current ratio had a significant relationship with initial IPO performance in the short run in Indonesia. Razafindrambinina and Kwan (2013:208) observed in their study that financial ratios such as ROA, current ratio, debt to equity ratio, and total asset turnover cannot be used to explain IPO returns. Khurshed *et al.* (1999:25) observed a negative relationship between the profitability of a company prior to going public and its long run performance and that the result was stronger for larger companies. The more profitable a company was prior to going public; the worse off its performance was in the long run. Goergen *et al.* (2007:407-408) established that companies that earned profits in the last three years prior to their listing showed more underperformance than companies which were running at a loss prior to their listings. Mulyono and Khairurizka (2009:49) highlighted that profitability, turnover and market ratio had a significant impact on the IPO returns.

With regards to IPO success and failure, several studies (Hillegeist, Keating, Cram & Lundstedt, 2004; Ohlson, 1980; Altman, 1968) have documented the importance of various measures of leverage as predictors of a company's failure in non-IPO settings. Demer and Joos (2005:22) found that leverage had a positive relationship with the likelihood of failure for companies in the non-tech, combined high tech and Internet, and high tech sectors. Peristiani and Hong (2004:5) used a company's ROA to gauge its financial strength and observed a strong and statistically significant negative relationship between the probability of delisting and a company's pre-issue return on assets. Amini and Keasey (2011:14) used EBIT at the IPO year as a profitability measure to determine the survivability of Small British IPO and found that companies with a positive EBIT had a lower failure rate, and lower survival rate than companies with a zero or negative EBIT.

In conclusion, after having examined the determinants of IPO returns and the success and failure of IPOs, it becomes evident that while some of these IPO characteristics have been identified to have significant relationship with IPO returns (short and long run) and IPO success and failure, others have been found to have no significant relationship. After reviewing these IPO characteristics, researchers (Carpentier & Suret, 2007:17; Boubakri, Kooli & L'Her, 2005: 6, Demer & Joos, 2006:17) concluded by suggesting that the market period, the company's age and gross proceeds are the IPO characteristics that can be used to predict IPO returns and IPO success and failure.

5.3. AN INTEGRATED FRAMEWORK LINKING IPO CHARACTERISTICS TO IPO RETURNS AND IPO SUCCESS AND FAILURE.

This section identifies a combination of IPO characteristics that will be tested in an attempt to find out their relationship with IPO long returns and IPO success and failure patterns on the JSE. As stipulated in the objectives, this study intends to determine which IPO characteristics can be used to predict IPO long run returns and IPO success and failure patterns. The diagram is presented in Figure 5 below.

Figure 5.1: An integrated framework linking IPO characteristics to IPO returns and IPO success and failure.
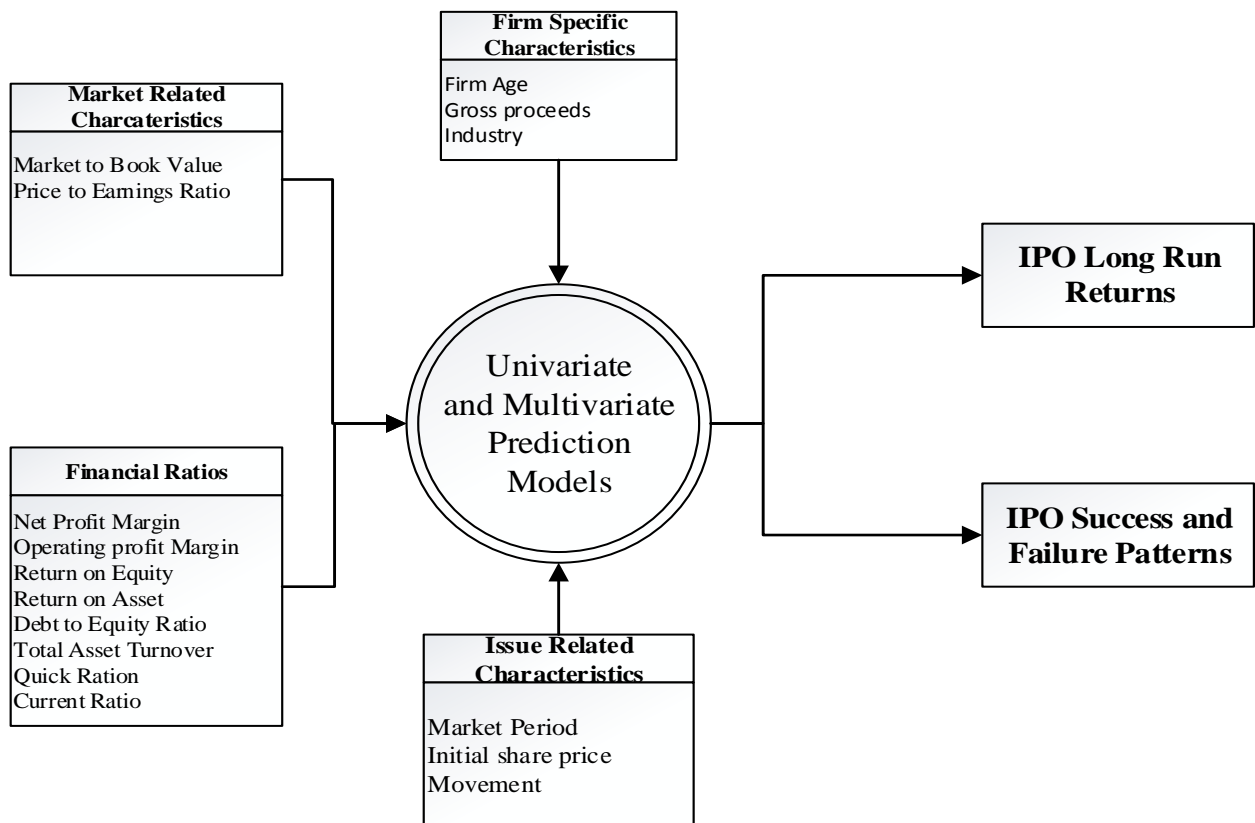
Source: Adopted by this study

Figure 5.1 shows an integrated framework linking IPO characteristics to IPO long run returns and IPO success and failure patterns. The IPO characteristics are grouped into firm specific characteristics; issue related characteristics; market related characteristics and financial ratios. The firm specific characteristics identified (gross proceeds, company's age and industrial sector); issue related characteristics (initial share price movement and IPO market periods); market related characteristics are the P/E and M/B; and financial ratios (net profit margin, operating profit margin, ROE, ROA, debt to equity ratio, total asset turnover, quick ratio and current ratio). The impact of these IPO characteristics of long run returns and IPO success and failure will be tested in chapter seven using a variety of univariate and multivariate analysis.

5.4. CHAPTER SUMMARY

This chapter examined the determinants of IPO returns (short and long run) and the success and failure of IPOs. IPO characteristics were classified in to firm specific characteristics (gross proceeds, company's age and industrial sector); issue related characteristics (initial

share price movement and IPO market periods); market related characteristics (P/E and M/B) and financial ratios. While some studies found some of these IPO characteristics to have a positive relationship with IPO returns and IPO success and failure, others found a negative relationship with these variables.

The literature review on the firm characteristics (gross proceeds, company's age and industrial sector) was examined. With regards to gross proceeds, researchers (Gounopoulos, Nounis & Stylianides, 2008; Deb & Vijaya, 2010; Kooli & Suret, 2002) indicated that the smaller the size of the issue, the higher the level of underpricing. With regards to the impact of the size on the long run performance, findings by (Kaya, 2012:73; Govindasamy, 2010:57-58) suggest that the larger the offer size, the lesser the level of underpricing and the worse off the long run performance. Moreover, other studies (Carpentier & Suret, 2007:2; Demers & Joos 2006:15; Kooli & Meknassi, 2007:39) found that small-sized IPOs had a high failure rate. The age of a company was established to have a positive relationship with IPO returns (Younesi, Ardekani & Hashemijoo, 2012:141; Ahmad-Zaluki and Abiding, 2011:322; Merikas, Gounopoulos and Nounis, 2009:14). By way of contrast, other studies by (Shikha & Balwinder, 2008:1; Kaya (2012:70) established that a company's age had no significant relationship with long run returns. Moreover, other studies by (Carpentier & Suret 2011; Demers & Joos 2007; Hensler *et al*., 1997) established that younger companies experience a higher post issue failure rate. In addition, with regards to the *industry*, several studies (Allen *et al.,* 1999:226; Kaya, 2012:73; How, 2000; Kooli & Meknassi 2007:4; Ahmad 2012:7:17) observed differences in initial returns and aftermarket returns between the different industry sectors and the success and failure of IPOs. These studies found that the returns emerging industries (biotechnology, semiconductor and internet IPOs) receive after a year were worse than those of non-emerging industry, but nonetheless, the long run performance for both industries was negative. Moreover, IPOs in the technology sectors experienced high failure rates and low survival rates.

With regards to the issue related characteristics (initial share price movement and IPO market periods), previous studies on the hot and cold market period (Alti, 2005; Almisher, Buell & Kish, 2002; Van Heerden & Alagidede, 2012:130) revealed that IPOs are more underpriced in hot market periods than in the cold market periods. Helwege and Liang (2004) highlighted in their study that IPOs issued during the hot market period resulted in poor long run performance. With regards to IPO success and failure, Amini and Keasey (2011:14) observed

that companies that went public during hot market periods had a high probability of failing in a shorter period of time than IPOs issued during the cold market periods. With respect to initial share price movement, Kiweu (1991) using price data collected from Nairobi Stock Exchange in order to determine the behaviour of share prices, established empirically that there were no reported patterns in share price movement. Yue (2009:20) investigated the short and long term performance of the 49 largest stocks in Hong Kong market which experienced weekly price movements of more than ±10% between 1999 and 2007. He found out that the share price declined when there was bad news, and increased when there was good news within two to three weeks. Moreover, in the long run large initial price increases were followed by negative performance. The large price declines were also followed by negative cumulative abnormal returns.

Also, the literature review on the market related characteristics (P/E and M/B) and financial ratios was examined. While studies (Hasan & Hadad (2013:93; Razafindrambinina & Kwan, 2013:208; Peristiani & Hong,2004:5; Demer & Joos, 2005:22) have found that these ratios (ROA, ROE, EBIT, M/B, P/E, Total asset turnover, debt to equity) have a positive relationship with underpricing, long run performance and IPO success and failure, others studies (Amini & Keasey, 2011:21; Andersson & Westling,2009:18; Chiraphadhanakul & Gunawardana, 2012:19.5) found that some of these ratios had no relationship with underpricing, long run performance and IPO success and failure.

Based on these establishments, an integrated framework was provided that identified a combination of IPO characteristics that will be tested to find out which ones can be used to predict IPO long run returns and the success and failure patterns of IPOs on the JSE.

CHAPTER SIX

RESEARCH METHODOLOGY

6.1. INTRODUCTION

The aim of this chapter is to explain the research methodology pursued in the empirical study. The research methodology used for this study will follow a research process and it is divided into six stages. Stage one of the research process will focus on the problem statement and the research objectives. Stage two will explain the various types of research design. In stage three, the sampling method will be presented. Stage four will explain the data collection methods. In stage five, the measurement technique will be described. Finally, stage six will present the method of data analysis.

6.2. THE BUSINESS RESEARCH PROCESS

The business research process is described by Cooper and Schindler (2003:64) as "the ordered set of activities focused on the systematic collection of information using accepted methods of analysis as a basis for drawing conclusions". Neelankavil (2007:42) views a business research process as the succession of activities planned by management in conducting research. The diagram for the business research process is presented on Figure 6.1 below.

Figure 6. 1: The Business Research Process

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                    ┌──────────────────────┐
                    │  Developing the      │
                    │  Research Focus      │
                    └──────────┬───────────┘
                               │
        ┌──────────────────────▼────────────────────────┐
        │  •   Identification of the research problem    │
        │  •   Establishment of the research objectives  │
        └──────────────────────┬────────────────────────┘
                               │
                        ◇ Research Design ◇
            ┌──────────────────┼──────────────────┐
   ┌────────▼──────────┐       │       ┌──────────▼──────────┐
   │ Qualitative       │       │       │ Quantitative        │
   │ Research          │       │       │ Resaerch            │
   └───────────────────┘       │       └─────────────────────┘
                               │
 ┌───────────────────┐  ◇ Sample Selection ◇  ┌──────────────────┐
 │ Population and     │◄──────────────────────►│ Sampling         │
 │ Sample size        │        │               │ Techniques       │
 └────────────────────┘        │               └──────────────────┘
                        ◇ Data Collection ◇
   ┌────────────────┐          │
   │ Data Extraction│───►┌──────────────┐───►┌──────────────────┐
   └────────────────┘    │ Data loading │    │ Data Cleansing   │
                         └──────────────┘    │ and Transformation│
                                             └──────────────────┘
                        ◇ Measurement Techniques ◇
   ┌────────────────┐         │          ┌──────────────────────┐
   │ UnderPricing   │◄────────┼─────────►│ Long Run Performance /│
   └────────────────┘         │          │ Long run Returns      │
                    ┌─────────▼────────┐ └──────────────────────┘
                    │ IPO Success and  │ ┌──────────────────────┐
                    │ Failure Patterns │ │ • Market Model        │
                    └──────────────────┘ │ • CAPM                │
                                         │ • Fama and French     │
                                         └──────────────────────┘
                        ◇ Data Analysis ◇
                    ┌──────────────────┐
                    │ Reporting of the │
                    │ results          │
                    └──────────────────┘
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Source: Adopted by this study

6.2.1. STAGE ONE: PROBLEM STATEMENT AND RESEARCH OBJECTIVES

The first stage one of the research process focuses on the problem statement and the research objectives

6.2.1.1. Problem statement

The Problem statement is the basis for and the justification for the signification of the study. According to Wiersma (1995:404) "the problem statement describes the context for the study and it also identifies the general analysis approach". Cooper and Schindler (2006:101) stress that a problem statement " needs to convince the sponsor to continue reading the proposal" Creswell, Vicki and Clark (2011:149) state that a problem statement conveys a specific problem and issue that needs to be address and the reasons as to why the problem is important. The research problem must, therefore, be clearly defined and formulated to make sure the results attained are relevant as a basis for drawing conclusions".

The motivation for this study stems from the fact the long run underperformance of IPO shares hurts investors, since they do not get an opportunity to earn superior long run returns from their investments. The high rate of initial underpricing and long run underperformance have been accompanied by high failure rates and low success rates of IPOs all around the world. As such in this environment of sensitive scrutiny and on-going market uncertainties, frequently characterised by information asymmetry, high levels of initial underpricing and long run underperformance, it is extremely difficult for investors to select successful IPO companies from failed ones. Also, the high failure rates, coupled with low success rates and decline in volumes associated with IPOs, result in investors being more critically concerned than ever about the returns on their investments. In addition, given that the poor long run returns of IPOs only happened to some IPO companies, while the other IPO companies show positive long run returns, it becomes critical to find out which IPO characteristics can be used to predict IPO returns on the JSE and differentiate between successful and failed IPO companies.

6.2.1.2. Research objectives

According to Bryman and Bell (2003:37) the research objective is the researcher's version of a business problem. The main objective of this study is to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the JSE.

This main objective was reached through the following secondary objectives;
- ➢ To review the literature on IPOs and the decision to go public.
- ➢ To review theoretical concepts on IPO underpricing and IPO long run performance.

- To examine existing literature on IPO success and failures in various stock markets in both developed and developing countries.

- To review the literature on the determinants of IPO returns and IPO success and failure.

- To appraise the level of initial underpricing on the JSE.

- To appraise the three years, five years and ten years long run performance of IPOs on the JSE.

- To investigate empirically if the differences in long run performance result from the choices of methodology (different techniques and formulas to measure return).

- To determine whether market related characteristics (P/E and M/B) can be used to predict long run returns and success and failure of IPOs on the JSE.

- To examine whether the issue related characteristics (hot and cold markets periods, and initial share price movements) can be used to predict long run returns and the success and failure of IPOs on the JSE.

- To determine whether firm characteristics (gross proceeds, company's age and industry) can be used to predict long run returns and the success and failure of IPOs on the JSE.

- To determine whether pre financial ratios can be used to predict long run returns and the success and failure of IPOs on the JSE.

6.2.2. STAGE 2: RESEARCH DESIGN

A research design is defined as the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process (Polit & Beck, 2004:49). Maxwell (2008:214-215) emphasises that a research design is a reflexive process functioning through every stage of a project, the "the activities of collecting and analyzing data, developing and modifying theory, elaborating or refocusing the research questions, and identifying and dealing with validity threats are usually going on more or less simultaneously, each influencing all of the others". Likewise, Churchill and Iacobucci (2004) emphasise that an appropriate research design helps to align the planned methodology to the research problems. Because different research designs attempt to answer different types of research problems, Zikmund (2003:68) reckons that the choice of research design should be based on the nature of the research, its setting, the possible limitations of the research and its underlying paradigm that notifies the research project. The various types of research designs are explained below;

6.2.2.1. Qualitative research

Zikmud, Babin, Carr and Griffen (2010:133) view a qualitative research as a research which focus is based on discovering meanings and new insights into a phenomenon without depending on numerical data. Creswell (1994) defines a qualitative research as an inquiry process of understanding a social or human problem based on building a complex, holistic picture created with words, covering detailed views of informant and performed in a natural setting. Robson, (1993) notes that in qualitative research, the theories and concepts tend to arise from inquiry coming after data collection than before and the research often starts with a research question and then allows an initial period of research to assist in developing hypothesis. Collins and Hussey (2003:13) point out that a qualitative research is subjective in nature since it requires examining and reflecting the views of humans in the understanding of the social and human activities investigated. The benefit of a qualitative research is that it enables the researcher to understand the context in which decisions and activities are undertaken (Myers, 2009:5).

6.2.2.2. Quantitative research

Cooper and Schindler (2008:162) state that the purpose of a quantitative approach is to measure consumer's behaviour, their knowledge, attitude and opinion about why things happen the way they do. Creswell (2003:18) point out that quantitative research is based on the "cause and effect thinking, reduction to specific variables and hypotheses and questions, use of measurement and observation, and the test of theories". The quantitative approach is believed to be a scientific approach (Robson, 1993) that starts with the development of a hypothesis from theory that requires testing. According to Foster (1998) quantitative approach involves statistical interferences and mathematical techniques required for data processing. Jonker and Pennick (2010:65) note that the essence of a quantitative research is to use theory to frame and understand the problem at hand. Moreover, quantitative research also entails carefully operationalizing a theory and then subsequent measurement is by means of variables and questions.

Table 6.1: Characteristics of qualitative and quantitative research

Criteria	Qualitative research	Quantitative research
Purpose	• To comprehend and interpret social interactions. • To build theory • Construct social reality	• To test hypotheses, look at cause and effect, and depict predictions • To test theory • To measure objective facts
Variables	• Takes into consideration the entire study and not variables.	• Study specific variables
Nature	• Holistic approach • Variable are unknown • It has a flexible guideline • Emergent design • Context dependent	• Focused approach • Variable are known • It has an established guideline • Static design • Context free
Type of Data	• Words, images, or objects.	• Collected numbers and statistics
Forms of data Collection	• Consist of open ended responses; field notes interviews, participant observations, and reflections.	• Consist of close questions, precise measurements using structured and validated data-collection instrument
Objectivity and Subjectivity	• Subjective in nature	• Objective
Type of Data Analysis	• Identify patterns, themes and features	• Identify statistical relationships using inferential and descriptive statistics
Results	• Specialized research findings are less generalizable.	• Research findings are generalized and can be applied to other populations
Scientific Method	• Exploratory • Develops new hypotheses and theory	• Confirmatory • Test theories

Source: Schoonraad, 2004; Johnson and Christensen, 2008:34; Lichtman (2006:7-8)

Based on the characteristics of a qualitative and quantitative research identified above, this study will use the quantitative research design, which Ghauri and Gronhaug (2005:204) define as studies whose findings are mainly the product of statistical summary and analysis. Another reason for selecting a quantitative research is that most of data required to calculate the long run return, success and failure patterns on the JSE, use quantitative information rather than qualitative information (as seen in studies by Blumberg, Cooper and Schindler, 2008). Moreover quantitative research does not only enable a comparison amongst established formulas for calculating long run performance, but also allows simple statistical test to be carried out in order to ascertain the significance of the test.

6.2.3. STAGE 3: SAMPLE SELECTION

According to Malhotra (1996:359), sampling enables the researcher to draw conclusions about the entire population by selecting some elements in the population. Issues to be discussed under the sample selection are: population and the sample size, and the sample design.

6.2.3.1. Population and sample size

A population is defined as a collection of all observations of a random variable under the study from which conclusions are drawn from. Zimund *et al.* (2010:387) view a population as all the groups of entities or people that form part of the research because of similar characteristics. Zimund *et al.* (2010:387) further define a sample as a subset comprising of a group of entities or few people selected from the population. The population sample for this study will comprise of all listed IPOs on the JSE from 1996 to 2007. A total of 313 IPO companies over a period of 1996-2007 were used in this study. The end date of 2007 is chosen so that share price data within the first 60 months from the listing date can be examined. The choice of the start date is based on the fact that it was from 1996 that the JSE All Share Index (ALSI) was introduced which will be used as the broad benchmark to assess the abnormal returns from these listings. The sample will include both listed and delisted companies. Also, since this study is focusing on the IPO long run performance, IPO returns and their success and failure patterns, the study sample is restricted to IPOs that were issued prior to 2007 so that their three, five and ten year aftermarket performance can be calculated.

6.2.3.2. Types of sampling design

Bryman and Bell (2003:100) identified two major types of sampling design - probability and non-probability sampling. These researchers define probability sampling as a controlled process that ensures that each representative group from a population element is given a known non-zero chance of selection. Saunders, Lewis and Thornhill (2009:213) observe that in a non-probability sampling, each representative group from a population element does not have an equal opportunity or chance of being included in the study .This study will use the non-probability sampling method.

Zikmud *et al.* (2010:396) and Cooper and Schindler (2008:169-170) identified three types of non-probability sampling; convenience sampling, snowball sampling and purposive sampling. These sample methods are listed with their advantages and disadvantages.

Table 6.2: Advantages and disadvantages of non-probability sampling

Technique	Descriptions	Advantages	Disadvantages
Purposive (judgemental)	Hand-pick of subjects on the internal knowledge of specific characteristics.	Only suitable candidates are selected for the particular purpose of the study.	Samples cannot be generalised as being the representative of entire populations due to potential subjectivity of researcher.
Snowball	Sample is selected using networks.	Possible to carry out the study when the researcher knows little about the group.	Difficult to identify whether the sample is a representative of the population.
Convenience	Self-selection of individuals or groups willing to volunteer in the research.	Inexpensive and fast, method.	Sample is not a complete representative of the entire population.

Source: Black 1999:118; Anotonisamy, Christopher and Prasanna, 2010: 62

For the purpose of this research, purposive sampling will be used to select IPO companies on the JSE based on population of listed and delisted companies on the JSE for a period of 1996 to 2007.

6.2.4. STAGE 4: DATA COLLECTION

This section will focus on the sources of data collection. Data will be collected by secondary methods.

6.2.4.1. Secondary data source

In this study, various combinations of secondary data will be used. Secondary data will be obtained from information on IPO listings on the JSE from 1996 to 2007. This information was sourced from:

- ➢ McGregor-BFA database where the annual financial reports, financial statements, offering price, and daily share prices (open and closing) from the first trading day of IPO companies were collected. Also the corresponding daily market prices (JSE all share index) were also obtained from McGregor-BFA database.
- ➢ The JSE yearly handbook.
- ➢ The IPO prospectus.
- ➢ International magazines, books, Academic Search Premier, Business Source Premier, Ebscohost and Emerald.
- ➢ JSE Stock Exchange News Service (SENS) news and Fin 24 Expert.

6.2.5. STAGE 5: MEASUREMENT TECHNIQUES

This section focuses on the meaurement techniques used in calculating IPO underpricing, IPO long run performance, IPO characteristics, IPO returns and IPO success and failure.

6.2.5.1. IPO underpricing

There market adjusted abnormal return have been the most widely used method in calculating underpricing (Aggarwal Leal & Hernandez, 1993; Hansen & Jørgensen, 2010:26; Van Heerden & Alagidede, 2012:132). The mean market adjusted abnormal return is calculated following the subsequent steps.

$$R_{x,i} = \frac{P_{x,i} - P_{x,0}}{P_{x,0}}$$

Where $R_{x,i}$ = return on stock 'x' at the end of the ith trading period.

$P_{x,i}$ = price of stock 'x' at the end of the ith trading period and

$P_{x,0}$ = offer price of stock 'x'.

i = represents either the first trading day, the first trading week or the first trading month

The average raw return is calculated as

$$\bar{R}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} R_{x,i}$$

Where $\bar{R}_{x,i}$ = the sum of the returns on the sample IPOs divided by the number of sample IPOs.

The JSE All Share Index (J203) is used as the benchmark and is calculated as:

$$R_{m,i} = \frac{J_{m,i} - J_{m,0}}{J_{m,0}}$$

Where $R_{m,i}$ = market return at the close of day i trading period

$J_{m,i}$ = the market index value at the end of the i trading period

$J_{m,0}$ = the market index value on the offer day of stock x.

The market-adjusted abnormal return ($MAAR_{x,i}$) for stock 'x' after ith, trading period is calculated as follows:

$$MAAR_{x,i} = 100 \times \left\{ \frac{(1 + R_{x,i})}{(1 + R_{m,i})} - 1 \right\}$$

The market-adjusted model measures the initial returns in excess of the market return. This measurement was used in studies on the short run performance of IPOs by researchers such as Van Heerden and Alagidede (2012:132) on the JSE, Aggarwal Leal and Hernandez (1993) on Latin American IPOs and Hansen and Jørgensen (2010:26) on Scandinavian IPOs. The average market-adjusted abnormal return for the ith trading period is.

$$\overline{MAAR}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} MAAR_{x,i}$$

Where $\overline{MAAR}_{x,i}$ = the sum of the market adjusted abnormal return of the sample IPOs divided by the number of sample IPOs.

To test the hypothesis, that $\overline{MAAR}_{x,i}$ equals zero, the following t-statistic is calculated:

$$t = \frac{\overline{MASRP_{x,d}}}{s/\sqrt{n}}$$.

where 's' is the standard deviation of MAAR $_{x,i}$ for a 'n' number of company.

For comparative purposes, this study will adopt the mean market-adjusted abnormal return, which is the standard method for calculating IPO underpricing.

6.2.5.2. Long run performance

Alvarez and Gonzalez (2001:4) asserted that long run underperformance of IPOs depended on the methodology used and these models are subject to limitations. For example, Barber and Lyon (1997:345) show that cumulative abnormal returns (CAR) ignores compounding while buy and hold abnormal return (BHAR) includes the effect of compounding. Eckbo (2010:163) elucidate that one attractive feature of using the BHAR is that the buy and hold returns provide an accurately and better measure for investors since it represents an actual investment experience than monthly rebalancing required in the other approaches used in measuring risk adjusted performance. Fama and French (2004:25) maintain that one of the significant attractiveness of the Capital Asset Pricing Model (CAPM) is that it offers a powerful prediction on measurement of risk and the relation between expected return and risk. Krause (2001:48-49) argues that the CAPM is a static model, which assumes the investment horizon to be a single period. Ritter and Welch (2002:32, 35) emphasise that the Fama French three factors is usually contaminated especially in periods of high IPO issuing. As a result, one will expect all models to have difference results based on all their shortfalls identified.

Given that studies on the JSE have calculated the long run performance (BHAR and CAR) using either market model, CAPM model, and Fama and French models, this study will calculate the long run performance of IPOs using all of these models for a three, five and ten year period over a period 1996 to 2007 to find out if the differences in returns result from the choices of methodology. Also, when calculating the long run performance, a distinction between benchmark selections, a calendar study versus an even study and a matching firm versus the treatment of delisted companies were taking into account. These models are explained in more details below.

6.2.5.2.1. Cumulative abnormal return (CAR)

For the cumulative abnormal returns, the return on a security or index is defined as:

$$r_{i,t} = \left(\frac{P_{i,t}}{P_{i,t-1}}\right) - 1$$

Where $P_{i,\,t}$ represents the prices of the security at the end of the current period and $P_{i,\,t-1}$ represents the prices of the security at the end of the previous periods (Suherman & Buchdadi, 2010:9).

The benchmark-adjusted return for stock i in event month t is defined as:

$$ar_{i,t} = r_{i,t} - r_{m,t}$$

Where $R_{i,t}$ is the return for company i in period t and $R_{m,t}$ is the return on a benchmark (JSE All Share Index) for the same period.

The average adjusted return for a portfolio of n stocks in period t is the mean of the benchmark-adjusted returns, which is given as:

$$AR_t = \frac{1}{N} \sum_{i=1}^{n} ar_{i,t}$$

The cumulative adjusted return during the 36-month aftermarket period is therefore the sum of the average adjusted returns for each period

$$CAR_t = \sum_{s=1}^{t} AR_s$$

According to Barber and Lyon (1997:358), the t-statistic for CAR in the event month t is computed as:

$$t_{CAR} = \frac{\overline{CAR}_{i,t}}{\sigma(CAR_{i,t})/\sqrt{n}}$$

Where

$\overline{CAR}_{i,t}$ = sample average

$\sigma(CAR_{i,t})$ = sample standard deviation

N = sample size

Although the CAR method is extensively used in most event studies, Barber and Lyon (1997:345) show that CAR ignores compounding while BHAR includes the effect of compounding. Also, Drobetz, Kammermann and Wälchli (2005:17) note that one problem with CAR is that it does not correctly measure the return to an investor who holds a security for a long post-event period (i.e. it does not represent an ex-ante suitable investment strategy).

6.2.5.2.2. Buy and Hold abnormal return (BHAR)

As an alternative to the use of CAR, studies use the buy-and-hold to compute three, five and ten year holding returns. Mitchell and Stafford (2000:296) defines the BHAR returns as "the average multiyear return from a strategy of investing in all companies that complete an event and selling at the end of a pre-specified holding period versus a comparable strategy using otherwise similar nonevent firms." Antoniou and Zhao (2004:6) views the BHAR as the return on a buy and hold investment in the sample company less the return on a buy-and-hold investment in the control company for T periods (following a three years aftermarket performance). For each company i stock, the long-term returns in the aftermarket is calculated from the first trading month and to the month where the stock celebrated its third anniversary.

The holding period return (BHR) for a company i stock is calculated for the period T as

$$BHR_{i,T} = [(1 + R_{i,1})(1 + iR_{i,2}) \dots \dots \dots \dots (1 + R_{i,t})] - 1$$

This formula can be rewritten as;

$$BHR_{i,T} = \left[\prod_{t=1}^{T} (1 + R_{i,t}) \right] - 1$$

Where $R_{i,t}$ is the raw return of company i stock at time t and T is the time period for which the BHR is calculated (Suherman & Buchdadi, 2010:12).

In order to calculate the BHAR on firm i over T period, the return of the market is subtracted from the return of the firm which can be calculated as follows:

$$BHAR_i = \frac{1}{N} \sum_{t=1}^{N} \left[\left(\prod_{t=1}^{T} (1 + R_{i,t}) \right) - \left(\prod_{t=1}^{T} (1 + R_{m,t}) \right) \right]$$

Barber and Lyon (1997:358), state that in order to test whether the average buy-and-hold return is significantly different from 0 or not, the t-statistic for BHAR in the event month t is computed as:

$$t_{BHAR} \frac{\overline{BHAR_{i,t}}}{\sigma(BHAR_{i,t})\sqrt{n}}$$

Where

$\overline{BHAR_{i,t}}$ = sample average

$\sigma(BHAR_{i,t})$ = sample standard deviation

N = sample size

Eckbo (2010:163) elucidate that one attractive feature of using the BHAR is that the buy and hold returns provide an accurately and better measure for investors since it represents an actual investment experience than monthly rebalancing required in the other approaches used in measuring risk adjusted performance. Kooli, L'her and Suret (2006:50) state that the BHAR method is an appropriate measure of investor experience. Chan *et al.* (2008) ascertain that the BHAR is preferred as the investment strategy because it is a simple representative of the returns that a long-horizon investor could earn. However, Drobetz, Kammermann and Wälchli (2005:259) propound that a problem with BHARs is that by compounding monthly returns, the long-run BHARs are severely skewed. Likewise, Fama (1998:294) observed that BHARs can show a false impression of the speed of price adjustment to an event since BHARs can grow with the return horizon even when there is no abnormal return after the first period.

6.2.5.2.3. Capital Asset Pricing Model (CAPM)

The CAPM was developed by Sharpe (1964), Lintner (1965) and Black (1972). Over the years, the CAPM model has acted as one of the fundamental tenants in financial theory. According to Nel (2011:5337-5338) and Fama and French (2004:28), the fundamental principle on the CAPM model is that the risk the investor takes should be proportional to the gains of expected returns of investment. The CAPM equates an asset's expected return to three variables, namely beta (β), the risk-free rate (R_f) and the expected market return (R_m), which is given by

$$E(R_i) = R_f + \beta_i [\![E(R_m) - R_F]\!]$$

Where

$E(R_i)$= expected return on the firm i in the event month,

R_f = risk-free rate,

β_i= beta of asset i,

$E(R_m)$= expected return on the market in the event month.

Beta is the covariance of asset returns and market returns divided by the variance of market returns. The formula is for beta is given by

$$\beta_i = \frac{Cov\ (R_i, R_m)}{Var\ (R_m)}$$

Where; Bi = beta (systematic risk) of asset i,

Cov (R_i, R_m) = the covariance between asset i and the market,

$Var\ (R_m)$ = the variance of the market returns

Alternatively, Beta can also be calculated using the ordinary least square regression method, where β_i is the slope of a regression of $(R_i - R_f)$ on $(R_m - R_f)$ for the estimation period with the regression line going through the origin.

Fama and French (2004:25) maintain that one of the significant attractiveness of the CAPM is that it offers a powerful prediction on measurement of risk and the relationship between expected return and risk. Amsa (2010:18) notes that the CAPM provides a benchmark rate of return for evaluating possible investments and also gives a precise prediction of the relationship investors can observe between the risk of an asset and its expected returns. By way of contrast, Kim (1997) contends that CAPM fails in empirical tests due to the error-in-variables problem, which occurs because the market betas are unobservable and cannot be estimated with high levels of precision. Krause (2001:48-49) argues that the CAPM is a static model, which assumes the investment horizon to be a single period.

6.2.5.2.4. Fama and French Three factor Model

According to Mangozhe (2010:12) Fama and French's (1993) three-factor model has gained popularity in empirical studies from the US and other countries. Fama and French (1996:56) propound that most of the apparent anomalies in the efficient market studies can be explained by using the three-factor model. The factors are defined by the excess returns on the market, the difference in returns between companies with high book-to-market value (BMV) and low BMV ratios and the difference in returns between large and small companies (SMB). The formula for the Fama and French three factor model is given as:

$$R_{it} - R_f = \alpha_t + \beta_{im}(R_{mt} - R_f) + \beta_{is}(SMB_t) + \beta_{ih}(HML_t) + \varepsilon_t$$

Where

R_{it} = Average monthly returns of portfolio i

R_f = Risk free rate observed at the end of each month

β_{im} = beta (systematic risk) of asset i

R_{mt} = Expected market return

(SMB_t) = the small-firm portfolio return minus the big-portfolio return (proxy for company Size)

HML_t = the high book-to-market portfolio minus the low book-to-market portfolio return (proxy for BE/ME)

β_{is} and β_{ih} are the factor loadings (other than market β) and also represent the slope(s) in the time series regression.

α_t and ε_t represent the intercept of the regression and the error term respectively (Mangozhe, 2010:14; Chan *et al*., 2008:50; Espenlaub, Gregory & Tonks, 2000:8)

In order to construct the portfolios for the size and book to- market (BMV) factors, we adopt the methodology used by Fama and French (1993), Mangozhe (2010:27-28) and Ahmad-Zaluki, Campbell, and Goodacre (2006:17-18). Size was calculated by multiplying the share price by the number of shares issued. The book to market ratio was calculated by dividing the book common equity for the fiscal year ending in calendar year t-1, by market equity at the end of December t-1. All the JSE stocks in the study sample were ranked by market capitalisation and then divided into the top (big) 50% and bottom (small) 50%. All the stocks were also split into the bottom 30%, the middle 40% and the top 30% based on the book to market ratios (BMV) as per Ahmad-Zaluki *et al.* (2006:17-18). Six value-weighted portfolios, namely Small Low (S/L), Small Medium (S/M), Small High (S/H), Big Low (B/L), Big Medium (B/M) and Big High (B/H) were then constructed based on the intersections of the two size and three book-to-market ratio groups.

The SMB was calculated as SMB = (S/L + S/M + S/H)/3 − (B/L + B/M + B/H)/3 and HML was calculated as HML = (S/H + B/H)/2 − (S/L + B/L)/2

The S/L portfolio comprised of companies that were both small in size with a low in B/M. The S/M portfolios consisted of companies that were both small in size and medium in B/M. The S/H portfolios were made up of companies that were both small in size and high in B/M. Moreover, the B/L portfolio comprised of companies that were both big in size and low in B/M. The B/M portfolio consisted of companies that were big in size and medium in B/M. The B/H portfolios were made up of companies that were big in size and high in BE/ME (Bhatnagar & Ramlogan, 2009:12).

Fama and French (1996) highlights that the advantage of the three factor model is that it captures the performance of stocks that are grouped based on size and book to market equity ratios. However, in spite of the popularity of this model, Fama French three factor model is not without weakness. Ritter and Welch (2002:32, 35) emphasize that the Fama French three factors is usually contaminated especially in periods of high IPO issuing. Also, the regression approach postulates that a company's market size and book to market characteristics need to

be stable over time, whereas the matching portfolio approach allows a company's portfolio assignment to be changed once every year. Lam (2005:8) points out that although Fama and French use empirical results to stress the importance of their model, they failed to provide an explanation as to why "distress risk" is priced. Furthermore, the model does not explain the continuation of momentum effect (short term return) but argues that the momentum effect could be a results of either snooping or survivor bias.

To conclude, after having looked at the methods used in calculating long run returns, it was observed that each of these methods to a greater extent will produce different results since there is a considerable variation in the measures of abnormal returns. Thus, this study will use all three models to calculate a three, five and ten year after market returns of IPOs over a period 1996 to 2007 and find out if the differences in long run performance result from the choices of methodology.

6.2.5.2.5. Selection of benchmark

In calculating the long run performance of IPOs on the JSE, this study uses three different models. When determining the long term performance of IPOs, a suitable benchmark needs to be selected. The models used are the market adjusted model, the CAPM and the Fama and French. The CAR and BHAR are calculated for each of the models. The JSE All Share Index was used as the benchmark for calculating the BHAR and CAR.

6.2.5.2.6. Even time and Calendar time analysis

In calculating the long run performance, researchers usually make use of either the event time or calendar time analysis. An event study measures the impact of a specific event on the value of the company. In an even time analysis, a month is defined as 21 trading days, with 252 trading days in a year, and the returns are calculated for 1–12, 1–24, 1–36, 1–48, and 1–60 months after the company goes public, respectively an approach consistent with previous research (Michaely, Thaler, & Womack 1995; Loughran & Ritter, 1995; Ikenberry & Ramnath, 2002). Binder (1998:125) notes that the major advantage of the event time study is that it allows abnormal returns to differ across companies and also allows for easily testing of joint hypotheses about the abnormal returns. Hoechle, Schmid and Zimmermann (2009) views the calendar time approach as a two-step process in which the first step entails computing the average return for the cross section of the IPO companies. This is done by creating monthly calendar time portfolio of companies that have issued IPOs in the past based

on the period of the event performance being investigated (Mitchell and Stafford, 2000:308). Fama (1998) favours the use of calendar-time portfolio approach for measuring long run performance because monthly returns are less vulnerable to the bad model problem. Also, by using monthly calendar-time portfolios, all cross-correlations of event-companies abnormal returns are automatically accounted for in the portfolio variance. However, in spite of the apparent attractiveness of the calendar-time and event time approach, Mitchell and Stafford (200:289) contend that the calendar-time portfolio approach fail to measure significant abnormal returns if abnormal performance mostly exists in months of heavy event activity (i.e. it has a low power to detect abnormal performance in hot and cold event activity)

In calculating the long run returns this still will used the event time analysis where a month is defined as 21 trading days, with 252 trading days in a year, and the returns will be calculated for 1–12, 1–24, 1–36, 1–48, 1–60, 1-72, 1-84,1-96,1-108, and 1-120 months after a company goes public.

6.2.5.2.7. Matching firm versus treatment of delisted companies

When companies go public, some of them end up being delisted within their anniversary date, either because of liquidation, bankruptcy, mergers or acquisition. When a company delists before the 36 month, 60 month or 120 month test period, its long run performance is usually calculated only for the companies that survived for that sample period (36 month, 60 month or 120 month test period) or a matching firm approach is used (Ritter, 1991, Loughran and Ritter, 1995:27; Chang, Kim and Shim, 2013:9; Lee, 2002:62). For companies that delist before their three or five year anniversary of their offer date, the buy and old returns stop on the issuer's delisting date. The buy and hold return of each matching company is then calculated over the identical period as the issuer. For each event company, a control firm (matching firm) is selected from the same size or/and BMV portfolio in the month before announcement that has the closest match (based on the prior six to nine month return) and has not been involved in the same type of event (repurchase or SEO) in the prior 36, 60 or 120 months. A control firm is identified by matching each of the sample company' with the company with the most similar size and book to market ratio (Loughran & Ritter, 1995: 27; Lee, 2002:62). The control firm is then identified as that company with the closest book to market ratio or same size (Fama & French, 1992). The control firm is confirmed if: the control firm has at least 24 pre-event months of returns available on the stock market; is not in bankruptcy; and is not a financial or utility company.

Moreover, if the matching firm delists prior to the end of the three, five or ten year horizon (or its matched issuer's delisting date, whichever is earlier), the second closest match company is use as the replacement. Also, a third closest matching firm is again selected if the second closest is delisted later (seen in Shumway, 1997). Lee (2002:62) highlights that another way of dealing with delisted matching firms prior to the end of the three, five or ten year horizon is to split the value-weighted return into the calculation from the day after the delisting date. Researcher such as Barber and Lyon (1997:346), and Lyon, Barber and Tsai (1999) criticize this approach by pointing out that a company's mean long run abnormal return calculated with truncation does not represent the average return an investor could earn from investing in an executable strategy, since the use of the proceeds from the investment in a delisted company is left unresolved. Kausar, Taffler, and Tan (2009) established that an inappropriate post-delisting reinvestment strategy in the case of financially distressed companies can lead to seriously misleading results.

In calculating the long run performance in this study, companies that were delisted before their 36, 60 and 120 month test period were not included in the sample period.

6.2.5.3. IPO characteristics

In this study, the selected IPO characteristics are classified in to firm characteristics (gross proceeds, company's age and industrial sector); issue related characteristics (initial share price movement and IPO market periods); market related characteristics (P/E and M/B) and pre financial ratios. These pre-financial ratios are current ratio, net profit margin, ROA, ROE, total asset turn over, quick ratio, operating profit margin, and debt to equity ratio (also used in other studies by Mulyono and Khairurizka, 2009:44 and Taani and Banykhaled, 2011:197). Given that some of these IPO characteristics have been established to have a relationship between IPO returns, IPO success and failure, these IPO characteristics will be used to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the JSE. A description of the IPO characteristics is explained below.

Table 6. 3: Definition of Variables

Variable	Definition	Data Source
Gross proceeds (Size of the issue)	Gross proceeds were calculated as the offer price at IPO times the number of shares issued.	JSE, IPO Prospectus
Age	A company's age is measured by subtracting number of years from the founding/incorporation of the business from the year it went public	IPO prospectus
Hot and cold market Period	Hot and cold market periods are defined based on the annual volume of new listings.	McGregor, JSE
Industry Dummies	Binary Industry dummies were reclassified based on based on -Financial - Mining -Technology -Other	McGregor, IPO prospectus
Initial share price movement	The formula is moving averages is given by $$\text{MA} = \sum_{k=1}^{days} \frac{\text{Price on day}_k}{\text{Number of days}}$$	McGregor,
Financial ratios	The financial ratios used by this study were current ratio, net profit margin, ROA, ROE, total asset turn over, quick ratio, operating profit margin, and debt to equity ratio	McGregor and IPO prospectus
Liquidity ratios		
ROA	ROA = Profit after tax / Total asset	
ROE	Net profit after taxes/Total shareholders' equity	
Operating profit margin	Operating income/ Net sales	
Net profit margin	Net Income/ Sales revenue	
Liquidity Ratios	Current asset /Current liabilities	

Current ratio		
Quick ratio	$\dfrac{\text{Current Assets} - \text{Inventory} - \text{Prepayments}}{\text{Current Liabilities}}$	
Solvency/ leverage ratio Total asset turn over Debt to equity ratio	Sales/Total assets Short Term Debt + Long Term Debt/Total Shareholders' Equity	
Market related ratios P/E M/B	Market value per share/ Earnings per share Market price per share/ Net asset value per share	

6.2.5.4. IPO returns

Generally, the motto of every investor is to earn maximum returns on their investment both in absolute and relative terms (Asma, 2010:8). Absolute returns are the returns (gain or loss on an investment portfolio) that a particular asset achieves over a certain period which is not compared to other measures or benchmarks. Relative return is the difference between the absolute return and the performance of the market which is usually gauged by a benchmark, or other index. Given the variability on investor returns, it becomes important to find out which IPO characteristics can be used to predict future IPO returns (with respect to both absolute and relative returns). A five year period is chosen because similar studies by Loughran (1993) and Loughran and Ritter (1995:27) reported that IPO underperform for approximately five years. Moreover, a five year period is chosen because Loughran, Ritter and Rydqvist (2008) explains that five years is most preferable because it shows the behaviour of IPOs in long term and can be used to identify times when investors will pay for an IPO relative to other companies or times when the market is overvalued.

For each company i stock, the long run returns in the aftermarket is calculated from the first trading day and to the month where the stock celebrated its fifth anniversary.

The absolute holding period return (BHR) for a firm i stock is calculated for the period T as

$$BHR_{i,T} = \left[\prod_{t=1}^{\min[T,delist]} (1 + R_{i,t}) \right] - 1$$

Where

$\min[T, delist]$ refers to either the last day of the JSE-listed trading or the end of the five year window depending on which comes first (Loughran and Ritter, 1995:27).

$R_{i,\,t}$ is the raw return of company i stock at time t and T is the time period for which the BHR is calculated.

The relative holding period return (BHR) for a company i stock is calculated for the period T as

$$\text{BHAR}_i = \frac{1}{N}\sum_{t=1}^{N}\left[\left(\prod_{t=1}^{\min[T,delist]}(1+R_{i,t})\right)-\left(\prod_{t=1}^{\min[T,delist]}(1+R_{m,t})\right)\right]$$

Where

$R_{m,t}$ is the market benchmark (JSE All share Index) returns.

6.2.5.5. IPO success and failure

This section focuses on the criteria used in determining IPO success and failure patterns on the JSE.

6.2.5.5.1. IPO failure

In determining IPO failure, this study defines IPO failure as the delisting of a company from the primary exchange either because of bankruptcy and liquidation, due to the poor performance of the company. In order to differentiate failed IPOs from non-failed IPOs companies on the JSE, this study began by identifying corporate delisting codes. After observing that the JSE does not have delisting codes showing their reasons for delisting, a decision was made to adopt a criterion for classifying failed companies on the JSE. From McGregor database the companies that delisted within their first five years subsequent to their IPOs were identified. From the sample, it was identified that 90 companies delisted within their first five years subsequent to their listings. In order to clearly identify companies that delisted as a result of bankruptcy and liquidation, their post IPO states were determined by visual inspection of their price patterns during their post listing periods. More specifically, this study considered companies that closed with a share price of one cents or below one cents and or had a sleepy falling price pattern prior to their delisting periods, to be delisted resulting from bankruptcy and liquidation. Sun (2004:13) adopted a similar methodology in determining the failure patterns of IPOs in Canada. Demers and Joos, (2005:11) classify failures as companies with share prices at or below $1.00 per share at the end of last date of

available data. Also, the adopted methodology adjusted for dividends and calculated their raw return using the BHAR to identify how many of them closed on their last trading day with either a positive or negative return. This was based on the assumption that companies who delisted with a negative returns delisted as a result of poor performance which is an indication of IPO failure (Li & Zhou, 2006: 2; Zhou, Zhang & Li, 2005:9; Lewis, Seward & Foster-Johnson, 2000: 7).

From the 90 delisted companies identified, it was further observed that 65 IPO companies had a negative raw return, and closed with a share price of one cents or below one cents and or had a sleepy falling price pattern prior to their delisting periods. The remaining 25 companies had a positive raw return and did not close with a share price of one cent or below one cent. Studies by Weber and Willenborg (2003) reported a delisting rate of 25.3% after 4 years. Bradley, Cooney, Dolvin and Jordan (2006) observed a delisting rate of 31.5% after 3 years. Furthermore, the corporate actions from McGregor, Sens news and other post financial publication's from the internet confirmed that these 25 companies were delisted as results of a merger, acquisition or a consortium. Based on these findings, the 65 companies were then treated as failure companies and the 25 companies as acquired companies.

6.2.5.5.2. IPO success

In determining IPO success, this study defines IPO success from an investor's perspective as when the shares of an IPO three to five years into an IPO have rewarded a positive risk-return trade-off to an investor. As discussed by Audretsch and Lehmann (2005:2), developing a measure of success for listed companies is challenging. As a result, in order to ascertain successful IPOs, this study first classify the companies that did not delist within their 5 years of listing as "surviving" companies. The survival companies were then used to determine successful IPOs. Studies by Krishnan, Ivanov, Masulis, and Singh (2011) and Audretsch and Lehmann (2005:2) established that IPO survival indicates a company's long run financial strength and measures a company's post-IPO performance. Burhop, Chambers and Cheffins (2011:4) in their study also define IPO success by their survival rates and long run post IPO returns. Likewise, Kalleberg and Leicht (1991:144) found organizational survival to be an essential aspect of performance and a necessary condition for sustained business success.

To measure IPO success, existing literature used initial mispricing (Beatty & Ritter 1986; Hanley 1993; Reber & Fong 2006:3), which is measured as the difference between the offer

price and market price at the end of the first day of trading and also by breaking down the market-to-book into two components, mispricing component and growth opportunities components. Trinugroho and Rinofah (2011:16-17) in their study measured mispricing by comparing the predicted value of market to book value (M/B Pre) with the actual value of the market to book value (M/B Act). Berger and Hinz (2008:3-4) measured IPO success based on the capital market success, which takes into consideration the development of stock prices after 180 days / 360 days. IPO success is then interpreted as the abnormal returns of the specific share according to the market adjusted returns model. The market adjusted returns model assumes that the ex-ante expected returns are the same for all shares and thus are all equal in any period to the expected market return in that period. The IPO abnormal returns is then calculated using the buy-and-hold-abnormal-returns (BHAR) separately for two time periods (180 days, 360 days) as well as either including and excluding the first day returns (from offer price to first day close).

Furthermore, other studies measure IPO success by using post IPO long-run market and operating performance (Ritter 1991:8; Kalleberg and Leicht, 1991:145, Wilbon, 2003:238; Yap, 2009:4). Ritter (1991:8) in his study measured IPO long run market performance by firstly calculating the aftermarket performance using BHAR and CAR and then interpreted the returns by computing the wealth relative index as a performance measure. A wealth relative index greater than one is interpreted as IPO outperforming a portfolio of its benchmark. Also, a wealth relative less than one is interpreted as IPO underperformance. Yap (2009:15) calculated the post IPO operating performance using industry-adjusted operating return on assets (ROA), industry-adjusted operating return on outstanding equity (ROE) and market to book ratio. Wilbon (2003:238) measured post IPO performance using the average ROE since the inception of the IPO. An IPO was considered to be highly successful if its average ROE exceeded 30% and successful if it had an average ROE is below 30% but above 5%.

In calculating IPO success, this study will adopt the methodology used by Ritter (1991:8), Orman (2005) and Wilbon (2003:238). Firstly, the five years aftermarket performance holding period return will be calculated where the return of the company is subtracted from the return of the market and the returns are interpreted using the wealth relative index. A wealth relative index greater than one will be interpreted as IPOs outperforming a portfolio of

its benchmark and a wealth relative less than one considered as IPO underperformance. The wealth relative is defined by

$$WR= \frac{1 + average\ 5\ years\ total\ return\ on\ IPO}{1 + average\ total\ return\ on\ benchmark\ (JSE\ All\ share\ Index)}$$

Secondly, the companies average ROE for five years will be calculated. A positive ROE will be interpreted as IPO outperformance and a negative ROE as IPO underperformance. In order for a company to be considered successful, it needs to have a wealth relative greater than one and a positive five year average ROE. In the case where a company had either positive ROE or a wealth relative less than one, it was considered a survival company.

6.2.6. Stage 6: DATA ANALYSIS

All statistical analyses in the study were done using Microsoft Excel and Statistical Package of Sciences (SPSS). Data was interpreted using descriptive statistical tools like percentages, frequency distribution tables, histograms and charts. Furthermore, inferential statistics, such as cross-tabulation, chi-square, ANOVA, t-test, correlation analysis, multiple regression analysis, PCA and SEM are also used for further analytical purposes.

6.2.7. CHAPTER SUMMARY

The aim of this chapter is to explain the research methodology pursued in the empirical study. The research process was divided into six stages. Possible explanations and justifications were provided for adopting specified methods and processes. A total of 313 IPO companies over a period of 1996-2007 were used in this study and this information was sourced from McGregor-BFA database. The data was analysed using Microsoft Excel and SPSS statistical software, descriptive statistical and inferential statistics.

CHAPTER SEVEN

RESEARCH RESULTS

7.1. INTRODUCTION

The aim of this chapter is to present the research findings. The results are presented within the parameters set by the literature review and the methodology. The analyses will begin with a general description of IPOs on the JSE. The second part of the presentation will be divided into four parts. Part A will focus on IPO underpricing on the JSE for the period 1996 to 2007. Part B will examine the three, five and ten year performance (BHAR and CAR) of IPOs using the market model, the CAPM model and the Fama and French three-factor model. Part C will focus on the long run returns for IPOs on the JSE over a five year period using absolute and relative returns. Lastly, Part D will examine the IPO success and failure patterns for IPOs on the JSE over a five year period.

7.2. Description of IPOs on the JSE for the period 1996-2007

This section presents a breakdown of the number of yearly listings from 1996-2007.

Table 7.1: Breakdown of IPO listings per year

Year	Number of IPOs included in the Sample
1996	18
1997	42
1998	74
1999	49
2000	10
2001	5
2002	8
2003	3
2004	8
2005	15
2006	29
2007	52
TOTAL	**313**

Table 7.1 provides a breakdown of the number of IPOs issued on the JSE from 1996-2007. From the table, it is observed that the years with the highest number of listings are 1998, 1999 and 2007. The years with the least number of listings are 2002 and 2003. In this study, purposive sampling was used to select IPOs on the JSE based on the population of listed companies within the period from 1996 to 2007 and this information was sourced from the McGregor database. Moreover, in calculating the long run performance in this study, companies that were delisted before their 36, 60 and 120 month test period were not included in the sample period. There are however, many companies listed on the JSE but given that this study used the period from 1996 to 2007, only companies with complete information were included in this study. Also, the McGregor database was the only database used in collecting the annual financial reports, financial statements, daily share price movements (closing, average and volume) offering price, closing day prices of IPO companies. This accounts for the small number of listings for some of the years in the study sample.

7.3. PART A: IPO UNDERPRICING (INITIAL ABNORMAL RETURNS)

Part A is structured into four sub-sections. Firstly, the market adjusted returns of IPOs on the JSE for the first day, first week and first month is presented. Secondly, the annually IPO underpricing on the JSE from 1996–2007 is put forth. Thirdly, IPO underpricing based on market periods (hot and cold market) is presented. Lastly, IPO underpricing based on industry is presented.

7.3.1. IPO Underpricing using market adjusted abnormal return (MAAR)

Several studies have established that IPOs are usually characterised by high initial returns (Loughran *et al.,* 2010: 1-2; Ritter & Welch, 2002; Goergen *et al.,* 2007). The results on underpricing based on the first day, first week and first month are presented in Table 7.2 below.

Table 7.2: Market adjusted abnormal return (MAAR) for the period 1996-2007

Return	Raw Return	Avg. Market Returns	MAAR	Std. dev.	T-stats
First day	77.98%	-0.07%	78.10%	378.0555	3.65469***
First week	76.00%	-1.00%	78.57%	340.2947	4.08486***
First month	81.00%	3.00%	82.81%	390.7881	3.74907***

***Significant at 1%

From Table 7.2, it is clear that IPOs on the JSE are underpriced with average market-adjusted returns of 78.10%, 78.57% and 82.81% for the first day, first week and first month respectively. All three results are statistically significant at the 1% level. Also, established is that there is only a slight different between the raw returns and market-adjusted returns on the first day, which signifies that the market was efficient. Moreover, also observed is the fact that IPO returns at the end of the first trading month are the highest, followed by the first trading week and then the first day. However, the abnormal returns on the first day are only marginally lower than the first month returns, indicating little incentive not to sell on the first day of trading. These findings are consistent with other studies by Van Heerden, and Alagidede (2012) on the JSE. Using data for 138 South African IPOs that were listed on the JSE from 2006 to 2010, they found significant short run underpricing on the JSE, with an average market-adjusted return of 108.33% for the first trading day. Comparing the level of underpricing in South Africa established in this study (78.10% on the first trading day) to other developing countries such as Malaysia with 96.6% for a sample of IPOs dating from 1980 to 2006 and India with 92.7% for the sample of IPOs dating from 1990 to 2007 (Loughran *et al.,* 2010), it is clear that the results are quite similar indicating that high levels of underpricing is an international phenomenon.

From the above, given that the abnormal return on the first day is only marginally lower than the first month return, indicating little incentive not to sell on the first day of trading; the subsequent sections will only focus on underpricing on the first trading day.

7.3.1.1. Annual IPO underpricing on the JSE for the period from 1996-2007

This section presents the market adjusted returns of companies listed in each year from 1996–2007.

Table 7.3: Yearly MAAR on the JSE for the period 1996-2007

Years	Number of IPOs	Raw Return	MAAR	Std. dev.	T-stats
1996	18	11.10%	11.30%	27.308	1.753832*
1997	**42**	**115.10%**	**115.20%**	**281.697**	**2.650442****

1998	**74**	**97.70%**	**98.70%**	**149.188**	**5.688621*****
1999	**49**	**43.00%**	**43.27%**	**107.230**	**2.824434*****
2000	10	10.50%	10.70%	15.465	2.181046*
2001	5	-0.90%	-2.00%	3.128	-1.44251
2002	8	14.40%	15.30%	33.742	1.278856
2003	3	-2.30%	-2.30%	2.108	-1.8822
2004	8	7.60%	7.60%	19.685	1.089242
2005	15	10.30%	10.10%	22.267	1.760442
2006	**29**	**23.20%**	**22.70%**	**41.106**	**2.974617*****
2007	**52**	**162.80%**	**162.00%**	**864.480**	**1.350939**

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

From Table 7.3, it is established that the level of underpricing is substantially different across the years, with the years (1997-1999 and 2006-2007) recording the highest levels of underpricing and the years (1996 and 2000-2005) recording the lowest levels of underpricing. Also observed is the fact that the higher the number of listings, the higher the level of underpricing, and the lower the number of listings, the lower the level of underpricing. These results are statistically significant at the 1%, 5 % and 10% level.

7.3.1.2. IPO underpricing in hot and cold market periods

Several studies have found that the initial returns in hot market periods are significantly greater than initial returns in cold market periods (Lawson and Ward, 1998:17; Alti, 2005; Almisher *et al.,* 2002). Based on the results on Table 7.3, this study differentiates hot and cold market periods based on the number of listings (also used in other studies by Aggarwal, 2006 and Helwege & Liang, 2002).

Table 7.4 : MAAR based on hot and cold market periods for the period 1996-2007

	Number of IPOs	Raw Returns	MAAR	Std. dev.	T-stats
Hot market	246	96.80%	96.90%	424.515	3.580678***
Cold market	67	8.90%	9.00%	74.933	2.125932**

2-tail: ***Significant at 1%; **Significant at 5%

Table 7.3, showed that from the period 1996-2007, two hot market periods (1997-1999; 2006-2007) and two cold market periods (1996; 2000-2005) were identified on the JSE based on the number of IPOs issued during those periods. From Table 7.4, it is observed that 67 IPOs were listed in a cold market period as oppose to 246 of the IPOs listed during the hot market period. Also evident is the fact that IPOs on the JSE are substantially more underpriced in the hot markets (96.9%) as their market adjusted returns are much higher than in the cold market (9.0%). This finding is consistent with similar studies conducted on the JSE by Lawson, and Ward (1998) for the period 1975 to 1995 and Lattimer (2006) for the period of 1996-1999. Moreover, other studies by (Alti, 2005; Almisher *et al.,* 2002) also established that IPOs are more underpriced in hot market periods than in the cold market periods.

7.3.1.3. IPO underpricing based on industries

Differences in initial returns have been established across various industries (Kiymaz, 2000; Uddin & Raj, 2012). In this study, industries are classified into financial, mining, technology and other as used by Govindasamy (2010) and Van Heerden, and Alagidede (2012) in their studies on the JSE.

Table 7.5: MAAR based on Industries for the period 1996-2007

Industry	Number of IPOs	Raw Return	MAAR	Std. dev.	T-stats
Financial	55	189.80%	**189.80**%	835.068	1.685766*
Mining	36	36.70%	36.20%	167.728	0.648945
Technology	63	107.50%	**108.40**%	168.0126	5.121116***
Other	159	40.00%	36.90%	140.632	3.312107***

2 tail: ***Significant at 1%; *Significant at 10%

The results in Table 7.5 depict that there is a fairly equal split in the number of IPO listings across the four industries. Also, there is a substantially and huge difference in the level of underpricing across the four industries. IPOs in the financial (189.8%) and technology (108.4%) sectors recorded the highest levels of underpricing when compared to IPOs in the mining and other sectors and these results are statistically significant at the 1% and 10% level respectively. These findings are consistent with the study by Van Heerden, and Alagidede (2012:135) that the highest level of underpricing was recorded in the financial sector (548.743%), and the lowest level of underpricing was seen in the mining sector and other sectors (71.163% and 57.967% respectively). However Schlag and Wodrich (2000:9) observed in Germany that the lowest level of underpricing was recorded in the banking sector and the leather and textile industry (1.2% and 2.7% respectively).

7.3.1.4. Conclusion

This section began by looking at the total number of listings on the JSE, where it was found that the year 1998 recorded the highest number of listings while the least number of listings were recorded in 2002 and 2003. Thereafter the underpricing of IPOs on the JSE was examined. It was established that IPOs on the JSE are underpriced with an average market-adjusted returns of 78.10%, 78.57% and 82.81% for the first day, first week and first month respectively and these results are significant at a 1%. These findings are in line with other studies by Loughran, Ritter and Rydqvist (2010) and Van Heerden, and Alagidede (2012). Also, it was observed that the level of underpricing is substantially different across the years, with the years 1997-1999 and 2006-2007 recording the highest levels of underpricing and the years 1996 and 2000-2005 recording the lowest levels of underpricing. Furthermore, also evident is the fact that the higher the number of listings, the higher the level of underpricing, and the lower the number of listings, the lower the level of underpricing.

With regards to the level of underpricing based on the hot and cold market periods, it was established that IPOs on the JSE are substantially more underpriced in the hot markets as their market adjusted returns (MAAR) are much higher than in the cold market and this finding is consistent with similar studies Lawson, and Ward (1998); Lattimer (2006); Alti, 2005; and Almisher et al., 2002). Furthermore, with respect to the industries, it was seen that the financial and technology sectors recorded a high level of underpricing when compared to IPOs in the mining and other sectors.

When looking at the high level of underpricing on the JSE, it is seen that investors can profit by buying the new issues at the offer price and sell them at the end of the first day of trading. Moreover, these high levels of underpricing on the JSE and especially in hot markets confirm that investors could significantly benefit more investing in IPOs only during hot market periods. Also, questions that emerge from the findings include: whether the high level of underpricing on the JSE can be explained by the winner's curse hypothesis where underwriters deliberately underpriced the shares to compensate uninformed investors with the intent to encourage them to submit their bid, or by the bandwagon effect (investors do not only take investment decisions based on their own information about an IPO, but also by following other investors) or whether investors on the JSE are overoptimistic.

7.4. PART B: LONG RUN PERFORMANCE ON THE JSE

Part B is structured into three sub-sections. The first sub-section focuses on the three year long run performance (BHAR and CAR) based on the market model, CAPM model and Fama and French three factor models. The second subsection focuses on the five year long run performance (BHAR and CAR) based on the market model, CAPM model and Fama and French three factor models. Lastly, the third subsection focuses on the ten year long run performance (BHAR and CAR), based on the market model, CAPM model and Fama and French three factor models.

7.4.1. Long run performance (BHAR and CAR) based on market model, CAPM model and Fama and French three factor model.

Fama (1998) maintains that it is hard to measure the long run performance and further indicates that the long run performance is sensitive to the methodology used. In this study long run performance is measured using both the BHAR and CAR for the market model, CAPM model and the Fama and French three factor model. The reasons for selecting all three models are stated in subsection, 6.2.5.2 on long run performance (methodology). In calculating the long run performance in this study, where companies were delisted within their three years, five years and ten years, these listings were not included in the sample as oppose to using the matching firm approach which appears to be a more robust model. This resulted in the initial sample size reducing from 313 to 269 for three years aftermarket performance and 220 for the five years aftermarket performance for the period 1996-2007. For the ten years sample, the period 1996-2002 was chosen to ensure that data for their ten years after market performance was available as oppose to the three years and five years

sample. This resulted in the initial sample size reducing from 313 to 81 for the ten years aftermarket performance.

7.4.1.1. Three year long run performance on the JSE the period 1996-2007

In this section, the three year performance was calculated using the market model, the CAPM model and Fama and French three factor model.

7.4.1.1.1. Market Model based on BHAR and CAR

The results on the three year long run performance are presented in Table 7.6 and 7.7 using the BHAR and CAR. The results on Table 7.6 are based on the **offer price** while the results on Table 7.7 are based on the **closing market price** at the first trading day.

PANEL A:

Table 7.6: IPO long run performance for a period of three years in comparison with the offer price (sample of 269) based on the Market Model

Years	BHAR		CAR	
	Returns	**T-stats**	**Returns**	**T-stats**
One year	58.21%	3.46398***	75.43%	2.977894***
Two years	-0.87%	-0.05914	38.91%	1.523546
Three years	-48.73%	-5.35923***	24.43%	0.937052

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

Table 7.6 shows the three year long run performance using the offer price. From Table 7.6, it is observed that for both the BHAR and CAR, IPOs on the JSE outperform the market in the first year (58.21% and 75.43% respectively) and the results are statistically significant at the 1% level. This result indicates that investors who bought the shares at the offer price and held the shares for one year, made significant profits. However, when looking at the BHAR strategy, it is discouraging for investors to hold the shares for longer periods as the second and third year returns are negative (-0.87% and -48.73%). The three year negative returns for the BHAR are significant at the 1% level. Although the CAR also shows a decreasing trend in the IPO returns over the years, the performance is still positive for the second (38.91%)

and third (24.43%) years indicating that investors who buy at the offer price are still able to have positive returns at the end of the third year. Nonetheless, this result should be interpreted with great caution as Barber and Lyon's (1997) established that BHAR yields negatively biased test statistic and CAR yields positively biased test statistic.

PANEL B:

Table 7.7: IPO long run performance for a period of three years in comparison with the closing market price on the first trading day (sample of 269) based on the Market Model

Years	BHAR		CAR	
	Returns	**T-stats**	**Returns**	**T-stats**
One year	-5.41%	-0.76227	-8.77%	-1.4492
Two years	-33.20%	-3.34163***	-45.29%	-6.08384***
Three years	-65.59%	-8.11958***	-59.77%	-7.27264***

 2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

Table 7.7 shows the three year long run performance using the closing market price at the first trading day. From Table 7.7, it is observed that for both the BHAR and CAR, IPOs on the JSE underperform the market over a three year period. The negative returns starting from year one shows that the effects of the huge initial underpricing have diminished and all indications are that the market overacted to the market price. This result suggests that investors who did not get the chance to buy their shares at the offer price (mostly individual investors) do not benefit from the abnormal returns and thus incur substantial losses starting from the first year (using BHAR and CAR). These findings are consistent with the study by Govindasamy (2010) which showed that IPOs on the JSE underperformed the market by 50% and 47% for BHAR and CAR respectively.

When comparing the three year long run performance using both the offer price and closing market price on the first trading day, based on their BHAR, it becomes evident that the long run performance measured using the closing market price (first trading day) is worse than the one measured using the offering price. These differences in long run performance can mainly be explained by high level of initial underpricing on the JSE. Also, this high level of long run underperformance (using the first trading day) gives the impression that the long run underperformance of IPOs on the JSE might be caused more by investor over-optimism than

by the deliberate underpricing by underwriters. Investors typically have very little information about the newly listed shares and their behaviour in early trading is conditioned by basic information. As information about the true value of the company is known, the market prices adjust slowly to such news, which is then reflected in the long run performance of the IPOs.

Drawing from the above, it becomes evident that the market clearly determines the price at which a share will be trade based on the closing market price instead of the initial offer price set by the underwriters and the issuing company. Fama (1998) claims that it is usually safe for companies to display a strong past earnings when they go public but the market, however, is the sole determinant of the true value of the company. Also, other studies by Loughran and Ritter (1995:27-28) found that it is more appropriate to use the closing market price instead of the offer price because it is often difficult for investors to buy shares at the offer price whereas the market price represents the price that is available for implementable portfolio strategy. Hence, this study will therefore calculate the three year (using the CAPM and Fama and French three factor model), five and ten year long run performance based on the closing market price on the first trading day.

7.4.1.1.2. Capital asset pricing model (CAPM) and Fama and French three factor model

The results on the long run performance are showed on Table 7.8 using the CAPM model and Fama and French three factor model.

Table 7.8: IPO long run performance for a period of three years using CAPM model and Fama and French three factor model

Years	CAPM				Fama and French			
	BHAR		CAR		BHAR		CAR	
	Returns	T-stats	Returns	T-stats	Returns	T-stats	Returns	T-stats
One year	-3.79%	-0.53175	-7.80%	-1.289	-18.84%	-0.70939	-7.88%	-1.38244
Two years	-31.22%	-3.1545***	-44.75%	-6.1387***	-32.00%	-1.21468	-25.05%	-3.37925***

Three years								
	-61.70%	-7.60503***	-58.47%	-7.16322***	-48.53%	-3.43871***	-24.46%	-2.99109***

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

From Table 7.8 it is established that when using the CAPM model and Fama and French three factor model, IPOs on the JSE underperform the market over a three year period and the underperformance is worse in the third year and the results are statistically significant at the 1% level. When comparing the results of CAPM to the Fama and French three factor model, it is observed that the IPO returns based on Fama and French three factor model (for both the BHAR and CAR) in the first year is worse than that of the CAPM. However, when looking at results from the second and third years, it is established that the IPO returns based on the CAPM (for both the BHAR and CAR) are worse than those of the Fama and French three factor model. These findings are consistent with findings by M'kombe and Ward (2002:11-12), who observed that when using the CAPM model, IPOs on the JSE underperform the market over a three year period by -21.41% and -21.92% when using the book to market portfolio benchmark. Moreover, the study found that the long run underperformance increased to -48.05% when using the market capitalization portfolio benchmark. By way of contrast, Ahmad-Zaluki *et al.* (2006:28) on their study on Malaysian IPOs found that significant abnormal performance disappeared when using the Fama and French (1993) three-factor model. Yong (2007:253) observed that there was no significant under- or over-performance after the initial return on Hong Kong and Singapore IPOs, using the Fama and French three factor model. Mangozhe (2010:1) also found no evidence of abnormal performance on the JSE for a period 1992 to 2007 using the Fama and French three-factor model.

In order to find out if there is any significant difference across the models used in calculating the three long run performance, the paired sample t-test was used.

Table 7.9: Three years paired sample t-test

	Paired Differences					t-stats	df	Sig. (2-tailed)
	Mean	**Std. dev.**	**Std. Error Mean**	**95% Confidence Interval of the Difference**				
				Lower	Upper			
Market Model BHAR vs. CAPM BHAR	-1.96%	0.97%	0.16%	-2.29%	-1.63%	-12.1200	35	.000
Market Model BHAR vs. Fama and French BHAR	-12.95%	13.76%	2.29%	-17.61%	-8.29%	-5.64600	35	.000
CAPM BHAR vs. Fama and French BHAR	-10.99%	13.17%	2.20%	-15.45%	-6.53%	-5.00600	35	.000
Market Model CAR vs. CAPM CAR	-0.80%	0.70%	0.12%	-1.04%	-0.56%	-6.83800	35	.000
Market Model CAR vs. Fama and French CAR	-12.32%	12.68%	2.11%	-16.61%	-8.03%	-5.828	35	.000
CAPM CAR vs. Fama and French CAR	-11.52%	12.90%	2.15%	-15.88%	-7.15%	-5.357	35	.000

Table title row above: **Paired Samples Test**

The results on Table 7.9 show that the BHAR and the CAR calculated using each of the three models (market model, CAPM, and Fama and French) are significantly different from each other. This confirms the findings by Fama (1998) who established that the long run performance of IPOs is sensitive to the methodology used. As such, it can be concluded that there is a significant statistical difference in the three year long run performance based on the methodology used.

The main conclusion, from this section is that there are significant differences in the results on IPO long run performance when using the offer price and the closing market price (first trading day). When using the market model based on the offer price, it is observed that for

both the BHAR and CAR, IPOs on the JSE outperform the market in the first year (58.21% and 75.43% respectively). This result indicates that investors who bought the shares at the offer price and held the shares for one year, made significant profits. However, when looking at the BHAR strategy, it is discouraging for investors to hold the shares for longer periods as the second and third year returns are negative (-0.87% and -48.73%). Furthermore, although the CAR also shows a decreasing trend in the IPO returns over the years, the performance is still positive for the second (38.91%) and third (24.43%) years indicating that investors who buy at the offer price are still able to have positive returns at the end of the third year. Nonetheless, this result should be interpreted with great caution as Barber and Lyon's (1997) established that BHAR yields negatively biased test statistic and CAR yields positively biased test statistic.

When using the market model based on the closing price, it is observed that for both the BHAR and CAR, IPOs on the JSE underperform the market over a three year period. The negative returns starting from year one show that the effects of the huge initial underpricing have diminished and all indications are that the market overacted to the market price. This result suggests that investors who did not get the chance to buy their shares at the offer price (mostly individual investors) do not benefit from the abnormal returns and thus incur substantial losses starting from the first year (using BHAR and CAR). Also, the long run performance measured using the closing market price (first trading day) is worse than the one measured using the offering price. These differences in long run performance can mainly be explained by the high level of initial underpricing on the JSE.

Moreover, also established is the fact that when using the CAPM model and Fama and French three factor model, IPOs on the JSE underperform the market over a three year period and the underperformance is worse in the third year. A paired sample t-test was used to find out if there is any significant difference in three year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that there is a significant statistical difference in three year long run performance across all three models. This finding conforms with a study by Fama (1998) who established that the long run performance of IPOs is sensitive to the methodology used.

When using the first trading day, it is clear that IPOs on the JSE underperform the market over a three year period using the market model, the CAPM model and Fama and French three factor model. Given that IPOs on the JSE underperform the market over a three year

period, it becomes necessary to find out their performance over a five year period. A five year period gives the companies time to adjust to the market and the problem of asymmetric information no longer becomes relevant. Loughran *et al.* (2008) explain that five years is most preferable because it shows the behaviour of IPOs in the long run and identifies times when the market is overvalued.

7.4.1.2. Five year long run performance on the JSE for the period 1996-2007

In this section, the five year performance (BHAR and CAR) will be calculated using the market model, CAPM model and Fama and French three factor model.

7.4.1.2.1. Five year IPO performance based on the Market Model

The results on the long run performance are showed on table 7.10 using the Market Model.

Table 7.10: IPO long run performance for a period of five years (sample of 220) using the Market Model

Years	BHAR			CAR		
	Returns	Yearly performance	T-stats	Returns	Yearly performance	T-stats
One year	-3.77%	-3.77%	-0.53207	-4.59%	-4.59%	-0.77337
Two years	-32.19%	-32.03%	-3.66024***	-35.65%	-31.06%	-4.8015***
Three years	-56.33%	-16.34%	-6.22473***	-46.75%	-11.11%	-5.51643***
Four years	-64.02%	2.90%	-5.43032***	-28.80%	17.96%	-1.55923
Five years	-64.37%	5.71%	-4.02447***	-7.77%	21.02%	-0.38115
N.B. *The returns are based on what happens from the first trading day to the end of each year. To further understand the performance of the IPOs over the years, the performance of the IPOs within each year (yearly performance) was also recorded. Within year four and five, the IPO performance tends to become positive (2.90% and 5.71% for the BHAR and 17.96% and 21.02% for the CAR).*						

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

The results on Table 7.10 indicate that IPOs on the JSE underperform the market in a five years period by 64.37% and 7.77% when using the BHAR and CAR respectively. When using the CAR, it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 28.80% and 7.77% respectively. The positive returns for CAR

identified in year four and five provide an incentive for investors to come in during the fourth year and possibly sell by the end of the fifth year. These results are not statistically significant in year four and five and as such, these trends should be interpreted with great caution. When using the BHAR, the level of underperformance drastically increases from year two and year three (-32.19% and -56.33% respectively) but remains relatively stable in year four and year five (-64.02% and -64.37% respectively). The stability in IPO performance for the fourth and fifth year can be explained by the positive trends established in year four and five. The BHAR however yields only slightly positive returns within years four and five given investors little incentive to come in at the beginning of the fourth year and leave by the end of the fifth year.

These results indicate that overall IPOs on the JSE underperform the market over a five year period. Also, established is the fact that whether investors hold their portfolios for over a three year or five year period, both portfolios will still underperform the market in the long run. Moreover, the level of underperformance is worse when using the BHAR than when using the CAR, which confirms the findings by Barber and Lyon (1997) who observed that BHAR yields negatively biased test statistics, while CAR yields positively biased test statistics. The long run underperformance of IPOs on the JSE in a five year period is consistent with prior studies by Kooli and Suret (2004:65) which established that IPOs in Canada underperform the market in a five year period after their listings when using cumulative abnormal returns. Also, when the calendar-time analysis was used, the results showed that IPOs significantly underperformed the market but when the event-time BHAR analysis was used, the result was no longer statistically significant. Gomper and Lerner (2003:2) examined the five year performance of listed IPOs in the USA and showed that IPOs underperform the market when using the BHAR model but that when using the CAR, the long run underperformance disappeared. M'kombe and Ward (2002:11-12) in their study on South African IPOs using the book to market portfolio as their determinants of BHAR found that IPOs on the JSE underperformed the market in a five year period by 61.56%.

7.4.1.2.2. CAPM and Fama and French

The results on the long run performance are presented on Table 7.11 using the CAPM model and Fama and French three factor model.

Table 7.11: IPO long run performance for a period of 5 years (sample of 220) using the CAPM and Fama and French three factor model

Years	CAPM				Fama and French			
	BHAR	T stats	CAR	T stats	BHAR	T stats	CAR	T stats
One year	-2.59%	-0.36694	-3.34%	-0.77337	-16.58%	-2.3508**	-15.57%	-2.62671***
Two years	-31.59%	-3.60951***	-34.96%	-4.8015***	-42.66%	-4.88518***	-43.27%	-5.83197***
Three years	-55.20%	-6.08343***	-45.89%	-5.51643***	-62.22%	-6.93259***	-49.25%	-5.8218***
Four years	-66.17%	-5.51176***	-29.56%	-1.55923	-107.23%	-9.07427***	-52.27%	-2.82758***
Five years	-65.86%	-4.00563***	-7.63%	-0.38115	-160.66%	-10.0574***	-51.94%	-2.54013**

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

From Table 7.11, when looking at the CAPM results (using CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 29.56% and 7.63% respectively. When using the BHAR, the level of underperformance drastically increases from year two and year three but remains relatively stable in year four and year five. Also, when looking at the Fama and French results (using BHAR and CAR), it is established that there is a drastic increase in the level of underperformance from year two to year five. The trends in the results on the CAPM are similar to those of the market model established in Table 7.10 above.

These results indicate that overall IPOs on the JSE underperform the market over a five year period using the CAPM to the Fama and French three factor model. These results are in line with the studies by M'kombe and Ward (2002:11-12) who established that when using the BHAR, IPOs on the JSE underperform the market over a five year period by 35.67% when using the CAPM model as the benchmark, and that the long run underperformance increased to 61.56% when using the book to market portfolio benchmark. Gomper and Lerner (2003:2) examined the five year performance of listed IPOs in USA and established that when using the CAPM and Fama and French three factor model, they both showed results which were insignificantly different from zero or even significantly positive in the long run. Conversely,

a study by Mangozhe (2010:74) on the long run investment performance of initial public offering in South Africa found no significant evidence of abnormal performance over a five year period using the Fama and French three factor model. Moreover, other studies by Choi, Lee and Megginson (2007:4) showed that IPO companies significantly outperform over a one, three and five year horizon in most countries using the Fama-French three factor model.

In order to find out if there is any significant difference across the models used in calculating the five year long run performance, paired sample t- test is used.

Table 7.12: Five years paired sample t-test

	Paired Differences					t-stats	df	Sig. (2-tailed)
	Mean	Std. dev.	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Market Model BHAR vs. CAPM BHAR	0.07%	1.44%	0.19%	-0.30%	0.44%	0.37000	59	.713
Market Model BHAR vs. Fama and French model BHAR	24.01%	26.36%	3.40%	17.20%	30.82%	7.05500	59	.000
CAPM BHAR - vs. Fama and French model BHAR	23.94%	25.19%	3.25%	17.44%	30.45%	7.36100	59	.000
Market Model CAR vs. CAPM CAR	-0.34%	0.83%	0.11%	-0.55%	-0.12%	-3.14800	59	.003
Market Model CAR vs. Fama and French model CAR	13.58%	12.29%	1.59%	10.40%	16.75%	8.55400	59	.000
CAPM CAR vs. Fama and French model CAR	13.91%	11.79%	1.52%	10.87%	16.96%	9.13900	59	.000

The results on Table 7.12 indicate that with five year BHAR the results of the market model are not significantly different from those of the CAPM. The Paired sample T-test for the Market Model BHAR versus CAPM, BHAR shows a p-value of 0.713 indicating no significant difference in the returns. However, the CAR for the market model and the CAPM are significantly different at the 1% level. There is also a significant difference in both the BHAR and the CAR between the Fama and French model and the market and CAPM. These results indicate that while the long run performance of IPOs is sensitive to the methodology, sometimes there is a possibility that two methods can provide similar results as the case for the five year BHAR using the market model and the CAPM model.

The main conclusion from this section is that there are significant differences in the results on IPO long run performance based on the three models used. When using the market model (CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 28.80% and 7.77% respectively. The positive returns for CAR identified in year four and five provides an incentive for investors to come in during the fourth year and possibly sell by the end of the fifth year. These results are not statistically significant in year four and five and as such, these trends should be interpreted with great caution.

When using the market model (BHAR), the level of underperformance drastically increases from year two and year three but remains relatively stable in year four and year five. The stability in IPO performance for the fourth and fifth year can be explained by the positive trends established in year four and five. The BHAR however yields only slightly positive returns within years four and five given investors' little incentive to come in at the beginning of the fourth year and leave by end of the fifth year.

When looking at the CAPM results (using CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 29.56% and 7.63% respectively. When using the BHAR, the level of underperformance drastically increases from year two and year three but remains relatively stable in year four and year five. Also, when looking at the Fama and French results (using BHAR and CAR), it is established that there is a drastic increase in the level of underperformance from year two to year five. The trends in the results on the CAPM are similar to those of the market model

These results indicate that overall IPOs on the JSE underperform the market over a five years period using the market model, the CAPM model and the Fama and French three factor model. Also established is the fact that whether investors hold their portfolios for over a three or five year period, both portfolios will still underperform the market in the long run. Furthermore, a paired sample t-test was used to find out if there is any significant difference in the five year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that while the long run performance of IPOs is sensitive to the methodology, sometimes there is a possibility that two methods can provide similar results as the case for the five year BHAR using the market model and the CAPM model.

Given that the overall results indicate that IPOs on the JSE underperform the market over a five year period, it seems that results show positive returns in year four and five. As such it becomes necessary to find out IPO performance over a ten year period. Loughran (1993) and Loughran and Ritter (1995:27) reported that IPO underperform for approximately five years.

7.4.1.3. Ten year long run performance on the JSE for the period 1996-2002

In this section, the ten year performance model (BHAR and CAR) was calculated using the market, CAPM model and Fama and French three factor model.

7.4.1.3.1. Ten year IPO performance using the Market model

The results on the long run performance are showed on Figure 1 using the BHAR and CAR model.

Table 7.13: IPO long run performance for a period of ten years on a sample of 81 companies using the Market Model

Years	BHAR			CAR		
	Returns	Yearly performance	T-stats	Returns	Yearly performance	T-stats
One year	-5.33%	-5.33%	-0.34005	-7.63%	-7.63%	-0.71529
Two years	-31.43%	-28.68%	-1.71418*	-34.25%	-26.62%	-2.63324**
Three	-50.66%	-16.44%	-2.43638**	-49.36%	-15.11%	-1.95701*

years						
Four years	-44.02%	18.08%	-1.50714	-35.20%	14.16%	-0.92596
Five years	-26.41%	27.53%	-0.64298	4.25%	39.44%	0.80709
Six years	-35.53%	32.88%	-0.81736	59.32%	55.07%	2.23209**
Seven years	-85.51%	34.70%	-2.38450**	86.51%	27.20%	2.78654***
Eight years	-76.99%	15.63%	-1.11062	100.86%	14.35%	3.13945***
Nine years	-65.16%	29.22%	-0.59231	120.64%	19.78%	3.44515***
Ten years	-25.43%	-0.29%	-0.19004	116.23%	-4.41%	3.29376***
N.B. *The returns are based on what happens from the first trading day to the end of each year. To further understand the performance of the IPOs over the years, the performance of the IPOs within each year (yearly performance) was also recorded. From year four to year ten, the yearly trends indicate positive performance for both the BHAR and the CAR.*						

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10% -25.43%

Table 7.13 shows the ten year long run performance based on a sample of 81 IPO companies for the period 1996-2002. It is established that when using CAR IPOs on the JSE outperform the market by 116.23% and the results are significant at the 1% level. Also, when using the BHAR, IPOs on the JSE underperform the market by -25.43% but the results are not statistically significant. These results indicate that investors on the JSE are able to earn a positive return from their fifth year which increases successively till the tenth year when using the CAR. Moreover, the yearly performance for both the BHAR and the CAR indicate that the IPOs tend to have positive returns successively from the fourth year to the tenth year. This provides a positive incentive for investors to select mainly portfolios comprising of companies that have been trading for at least four years.

Drobetz, Kammerman and Wälchli (2005:261, 271) examined the long run performance of 109 Swiss IPOs from 1983 to 2000 and found that there was underperformance of -173.46% (BHAR) after 120 months (ten years) when using Swiss performance index (SPI) as the benchmark. Also, when using Vontobel small-cap index (VSCI) benchmark, IPOs

underperform the market by -17.30% using the BHAR. The findings of this study also indicate a negative BHAR (-25.43%) using the JSE All Share Index although the results were not statistically significant. However when using CAR, Swiss IPOs underperform the market by -9.51% using the SPI benchmark and -101.33% when using the VSCI benchmark. The findings for the CAR are contrary to the findings in this study as the ten year CAR was significantly positive (116.23%). Nonetheless, these findings confirm that the difference in the performance results is based on the choice of the methodology used as well as the choices of benchmark used. Hence, investors should exercise much caution when using any of these methodologies to determine their long run performance.

7.4.1.3.2. CAPM and Fama and French

The results on the long run performance are showed in Table 7.14 using the CAPM and Fama and French three factor model.

Table 7.14: IPO long run performance for a period of 10 years on a sample of 81 companies using the CAPM and Fama and French models

Years	CAPM				Fama and French			
	BHAR	T-stats	CAR	T-stats	BHAR	T-stats	CAR	T-stats
One year	-1.62%	-0.10390	-3.81%	-0.36217	-0.69%	-0.05165	-1.76%	-0.71529
Two years	-26.92%	-0.46909	-29.48%	-2.36244**	-13.01%	-0.93574	-17.83%	-2.63324**
Three years	-46.66%	-2.26418**	-44.93%	-3.53895***	-22.65%	-1.60838	-29.54%	-3.62505***
Four years	-42.90%	-1.45390	-32.44%	-2.20452**	-38.61%	-2.09812**	-38.92%	-2.44782**
Five years	-22.89%	-0.54300	9.23%	0.56896	-55.95%	-2.35566**	-24.39%	0.28004
Six years	-25.09%	-0.56399	68.00%	2.57754**	-86.72%	-3.9086***	14.36%	2.38139**
Seven years	-58.85%	-1.64615	100.92%	3.46595***	-92.52%	-6.20063***	54.62%	3.20979***
Eight years	-28.15%	-0.41244	122.01%	3.98647***	-152.42%	-9.5821***	34.32%	3.63288***

Nine years	-8.42%	-0.07762	140.35%	4.16786***	-192.51%	-9.93219***	42.50%	3.90205***
Ten years	4.62%	0.03326	130.33%	3.95009***	-209.62%	-10.2021***	26.06%	3.66716***

2 tail: ***Significant at 1%; **Significant at 5%; *Significant at 10%

The results in Table 7.14 illustrate that IPOs on the JSE outperform the market by 4.62% and 130.33% (for BHAR and CAR respectively) when using the CAPM model. Also, when using the CAR, IPOs on the JSE outperform the market by 26.06% using the Fama and French models and these results are statistically significant at the 1% level. Also evident is the fact that the ten year BHAR is negative when using the Fama and French models. These results indicate that investors on the JSE are only able to earn a positive risk to return trade-off compensation for any extra risk they bear in the stock market from their fifth year when using the CAPM model (using CAR) and nine years (using BHAR). Moreover, using CAR, investors on the JSE are also able to earn positive returns from the sixth years when using the Fama and French model. These results are inconsistent with studies by M'kombe and Ward (2002:11-12), who found that when using the BHAR, IPOs on the JSE underperformed the market over a ten year period by 87.84% when using the CAPM model as the benchmark, and that the long run underperformance increased to -320.25% when using the book to market portfolio benchmark.

In order to find out if there are any significant differences across the models used in calculating the ten year long run performance, paired sample t-test is used.

The results on Table 7.15 below show that the BHAR and the CAR calculated using each of the three models (market model, CAPM, and Fama and French) is significantly different from each other. This is consistent with the findings from the three year long run performance and most of the five year long run performance. This confirms the findings by Fama (1998) that the long run performance of an IPO is sensitive to the methodology used. As such, it can be concluded that there is a statistically significant difference in IPO ten year long run performance based on the type of methodology used.

Table 7.15: Ten year paired sample t-test

	Paired Differences					t-stats	df	Sig. (2-tailed)
	Mean	Std. dev.	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Market Model BHAR vs. CAPM BHAR	-17.81%	20.35%	1.86%	-21.49%	-14.14%	-9.59100	119	.000
Market Model BHAR vs. Fama and French model BHAR	30.51%	57.71%	5.27%	20.07%	40.94%	5.79000	119	.000
CAPM BHAR - vs. Fama and French model BHAR	48.32%	74.47%	6.80%	34.86%	61.78%	7.10700	119	.000
Market Model CAR vs. CAPM CAR	-9.11%	6.81%	0.62%	-10.34%	-7.88%	-14.64800	119	.000
Market Model CAR vs. Fama and French model CAR	24.15%	35.61%	3.25%	17.71%	30.58%	7.42800	119	.000
CAPM CAR vs. Fama and French model CAR	33.26%	41.16%	3.76%	25.82%	40.70%	8.852	119	.000

The main conclusion from this section is that there are significant differences in the results on IPO long run performance based on the three models used. From this study it was established that when using the market model, IPOs on the JSE outperform the market by 116.23% when using CAR and underperform the market by -25.43% when using the BHAR . Moreover, IPOs on the JSE outperform the market when using the CAPM model and the Fama and French models (using CAR) and underperform the market when using Fama and French

models (using BHAR). These results indicate that investors on the JSE are able to earn a positive return from their fifth year which increases successively till the tenth year when using the CAR. Also, the yearly performance for both the BHAR and the CAR indicate that the IPOs tend to have positive returns successively from the fourth year to the tenth year. This provides a positive incentive for investors to select mainly portfolios comprising of companies that have been trading for at least four years. Moreover, investors on the JSE are only able to earn a positive risk to return trade-off compensation for any extra risk they bear in the stock market from the fifth year when using the CAPM model (using CAR) and ten years (using BHAR). Moreover, investors on the JSE are also able to earn positive returns from the sixth year when using the Fama and French model (using CAR). Furthermore, a paired sample t-test was used to find out if there is any significant difference in ten year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that there is a statistically significant difference in IPO ten years long run performance based on the type of methodology used. These findings again confirm that the difference in the performance results is based on the choice of the methodology used as well as the choices of benchmark used. Hence, investors should exercise much caution when using any of these methodologies to determine their long run returns.

7.4.2. Conclusion

The section examined the three, five and ten year long run performance of IPOs listed on the JSE using the market model, the CAPM model and the Fama and French three factor model. The results on the three year long run performance showed that there are significant differences in the results on IPO long run performance when using the offer price and the closing market price (first trading day). When using the market model based on the offer price, it is observed that for both the BHAR and CAR, IPOs on the JSE outperform the market in the first year (58.21% and 75.43% respectively). This result indicates that investors who bought the shares at the offer price and held the shares for one year, made significant profits (but less than those who sold on the first day). However, when looking at the BHAR strategy, it is discouraging for investors to hold the shares for longer periods as the second and third year returns are negative (-0.87% and -48.73%). Furthermore, although the CAR also shows a decreasing trend in the IPO returns over the years, the performance is still positive for the second (38.91%) and third (24.43%) years indicating that investors who buy at the offer price are still able to have positive returns at the end of the third year.

Nonetheless, this result should be interpreted with great caution as Barber and Lyon's (1997) established that BHAR yields negatively biased test statistic and CAR yields positively biased test statistic.

When using the market model based on the closing price, it is observed that for both the BHAR and CAR, IPOs on the JSE underperform the market over a three year period. The negative returns starting from year one show that the effects of the huge initial underpricing have diminished and all indications are that the market overacted to the market price. This result suggests that investors who did not get the chance to buy their shares at the offer price (mostly individual investors) do not benefit from the abnormal returns and thus incur substantial losses starting from the first year (using BHAR and CAR). Also, the long run performance measured using the closing market price (first trading day) is worse than the one measured using the offering price. These differences in long run performance can mainly be explained by the high level of initial underpricing on the JSE.

Moreover, also established is the fact that when using the CAPM model and Fama and French three factor model, IPOs on the JSE underperform the market over a three year period and the underperformance is worse in the third year. A paired sample t-test was used to find out if there is any significant difference in three year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that there is a statistically significant difference in the three year long run performance across all three models. This finding conforms with a study by Fama (1998) who established that the long run performance of IPOs is sensitive to the methodology used.

The results on the five year long run performance revealed that there are significant differences in the results on IPO long run performance based on the three models used. When using the market model (CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 28.80% and 7.77% respectively. The positive returns for CAR identified in year four and five provide an incentive for investors to come in during the fourth year and possibly sell by the end of the fifth year. These results are not statistically significant in year four and five and as such, these trends should be interpreted with great caution. When using the market model (BHAR), the level of underperformance drastically increases from year two and year three but remains relatively stable in year four and year five. The stability in IPO performance for the fourth and fifth year can be explained by the

positive trends established in year four and five. The BHAR however yields only slightly positive returns within years four and five given investors' little incentive to come in at the beginning of the fourth year and leave by the end of the fifth year.

When looking at the CAPM results (using CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 29.56% and 7.63% respectively. When using the BHAR, the level of underperformance drastically increases from year two and year three but remains relatively stable in year four and year five. The trends in the results on the CAPM are similar to those of the market model. Furthermore, when looking at the Fama and French results (using BHAR and CAR), it is established that there is a drastic increase in the level of underperformance from year two to year five. These results indicate that overall IPOs on the JSE underperform the market over a five year period using the market model, the CAPM model and the Fama and French three factor model. Also established is the fact that whether investors hold their portfolios for over a three or five year period, both portfolios will still underperform the market in the long run. Furthermore, a paired sample t-test was used to find out if there is any significant difference in five year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that while the long run performance of IPOs is sensitive to the methodology, sometimes there is a possibility that two methods can provide similar results as the case for the five year BHAR using the market model and the CAPM model.

The results on the ten year long run performance showed that there are significant differences in the results on IPO long run performance based on the three models used. From this study it was established that IPOs on the JSE outperform the market by 4.62% when using the CAPM model. Also, when using the CAR, IPOs on the JSE outperform the market by 26.06% using the Fama and French models and these results are statistically significant at the 1% level. Also evident is the fact that the ten year BHAR is negative when using the Fama and French models. These results indicate that investors on the JSE are able to earn a positive return from their fifth year which increases successively till the tenth year when using the CAR. Also, the yearly performance for both the BHAR and the CAR indicate that the IPOs tend to have positive returns successively from the fourth year to the tenth year. This provides a positive incentive for investors to select mainly portfolios comprising of companies that have been

trading for at least four years. Moreover, investors on the JSE are only able to earn a positive risk to return trade-off compensation for any extra risk they bear in the stock market from the fifth year when using the CAPM model (using CAR) and ten years (using BHAR). Moreover, investors on the JSE are also able to earn positive returns from the sixth year when using the Fama and French model (using CAR). Furthermore, a paired sample t-test was used to find out if there is any significant difference in ten years long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that there is a significant statistical difference in IPO ten year long run performance based on the type of methodology used. These findings again confirm that the difference in the performance results is based on the choice of the methodology used as well as the choices of benchmark used. Hence, investors should exercise much caution when using any of these methodologies to determine their long run returns.

To conclude, after having examined the long run performance of IPOs on the JSE, it can be deducted that the performance of IPOs varies across all the models used. The results from this study showed that the market model and CAPM produced similar trends with similar results. In particular, the paired sample T-test for the five year performance indicated that there was no significant difference (p = 0.713) between the market model BHAR versus CAPM, BHAR. However, the Fama and French results were significantly different from the CAPM and the market model for both BHAR and CAR. When comparing the Fama and French and the CAPM results, it was seen that the five year and 10 year performance using the Fama and French was worse than the results obtained from the CAPM for both BHAR and CAR. These results are similar with the findings by Saleh and Mashal (2008:43) who also established that the level of underperformance when using the Fama and French was worse than when using the CAPM for a five year period. These findings stress the effect the different benchmarks and methodology plays when calculating the long run performance of IPOs. Various studies (M'kombe & Ward 2002; Fama, 1998; Sun, 2004; Alvarez & Gonzalez 2001) emphasized that long run underperformance of IPOs depended on the methodology used. This assertion was also confirmed with the paired sample T-test which indicated that the long run performance of IPOs was significantly different based on the model used.

To conclude on which model is a better method for calculating long run performance, studies by Lam (2005:1-2) and Hu (2003:19) in comparing the CAPM and the Fama and French using different statistical analysis have concluded that neither is better than the other, since

different sets of data and periods yield different results. Fama and French (2004:25) maintain that one of the significant attractiveness of the Capital Asset Pricing Model (CAPM) is that it offers a powerful prediction on measurement of risk and the relation between expected return and risk. Krause (2001:48-49) argues that the CAPM is a static model, which assumes the investment horizon to be a single period. Ritter and Welch (2002:32, 35) emphasize that the Fama French Three Factors is usually contaminated especially in periods of high IPO issuing. Eckbo (2010:163) elucidates that one attractive feature of using the BHAR is that the buy and hold returns provide an accurately and better measure for investors since it represents an actual investment experience monthly rebalancing required in the other approaches used in measuring risk adjusted. According to Smith (2008:43), the Institute of Charted Financial Analyst (CFA institute) and SEC recommends that investment professionals, mutual funds and portfolio managers use the geometric (BHAR) approach to calculate IPO returns when reporting their performance. As a result, investors are recommended to use the model they are most comfortable with as all models have their advantages and disadvantages.

7.5. PART C: IPO LONG RUN RETURNS

This section focuses on finding out which IPO characteristics can be used to predict long run IPO returns (with respect to both absolute and relative returns) over a five year period. A five year period is chosen because Loughran *et al.* (2008) explain that five years is most preferable because it shows the behaviour of IPOs in long term. Moreover, in calculating the IPO long run returns, the BHAR approach was used (the formula is stated in subsection, 6.2.5.4 on long run performance in the methodology). The BHAR approach was used because studies by the Institute of Charted Financial Analyst (CFA institute) and SEC recommends that investment professionals, mutual funds and portfolio managers use the geometric (BHAR) approach to calculate IPO returns when reporting their performance (Smith (2008:43). Moreover, Eckbo (2010:163) elucidates that one attractive feature of using the BHAR is that the buy and hold returns provide an accurate and better measure for investors since it represents an actual investment experience than the monthly rebalancing required in the other approaches used in measuring risk adjusted performance.

This section is divided into two parts. The first part focuses on the descriptive statistics of absolute and relative returns based on IPO characteristics. Also ANOVA and chi-square statistical tests will be performed to find out if there are any significant relationships between IPO long run returns and the selected IPO characteristics. The second part of this section will

perform a cross sectional analysis where, regression analysis and structural equations will be used to clearly identify the relationships between IPO long run returns and selected IPO characteristics.

7.5.1. Descriptive statistics of absolute and relative returns

Absolute returns are the returns (gain or loss on an investment portfolio) that a particular asset achieves over a certain period which is not compared to other measures or benchmarks. Relative return is the difference between the absolute return and the performance of the market which is usually gauged by a benchmark, or other index. The absolute holding period return (BHR) for a company i stock is calculated for the period T as

$$BHR_{i,T} = \left[\prod_{t=1}^{\min[T,delist]} (1 + R_{i,t}) \right] - 1$$

Where

$\min[T, delist]$ refers to either the last day of the JSE-listed trading or the end of the five year window depending on which comes first (Loughran and Ritter, 1995:27).

$R_{i,t}$ is the raw return of company i stock at time t and T is the time period for which the BHR is calculated.

The relative holding period return (BHR) for a company i stock is calculated for the period T as

$$BHAR_i = \frac{1}{N} \sum_{t=1}^{N} \left[\left(\prod_{t=1}^{\min[T,delist]} (1 + R_{i,t}) \right) - \left(\prod_{t=1}^{\min[T,delist]} (1 + R_{m,t}) \right) \right]$$

Where

Rm,t is the market benchmark (JSE All share Index) returns.

A total of 313 IPO companies over a period of 1996-2007 was used in calculating the absolute and relative returns. The descriptive statistics of the absolute and relative returns are presented in Table 7.16 below.

Table 7.16: Descriptive statistics of long run absolute and relative returns

	Average return	Median	Standard deviation	T statistics
Absolute return	-6.82%	-64.92%	218.53%	-0.55
Relative return	-73.42%	-110.45%	208.09%	-6.21***

Sig. 2 tails: ***Significant at 1%

From Table 7.16 it is observed that the average long run absolute and relative returns are both negative. The long run relative returns (-73.42%) are worse than the long run absolute returns (-6.82%). The standard deviation for absolute return (218.53%) is higher than that of relative returns (208.09%). However, both are very high indicating that there is a great volatility in the absolute and relative returns. The finding indicates that on average, IPOs on the JSE have poor long run returns. Moreover, investors who focus on relative returns will be more disappointed because the returns are worse. A study by the RS Research Paper (2007:4) on Hong Kong found that the relative performances were worse than those of absolute performance for IPOs listed in 2006 which is consistent with the findings of this study.

There is a wealth of evidence (Loughran & Ritter, 1995:23; Govindasamy, 2010:42; Bessler & Thies, 2007) indicating that IPO companies earn very poor long run returns. However, there are some IPO companies who earn very high positive returns in the long run (Jotwan & Singh, 2011:58; Wang, 2011:10). While the results indicate that the average absolute and relative returns are both negative, there are however some individual companies who perform well. To further understand the long run returns of IPO on the JSE, the absolute and relative returns were then classified into groups. The IPOs were classified by grouping the companies that had positive long run returns separately from the ones that had negative long run returns. This was aimed at identifying the IPOs that showed positive long run returns as well as to determine the factors that can help differentiate IPOs with a positive long run returns from IPOs with a negative long run returns. After separating the IPOs into the two groups (positive and negative returns) it was seen that for IPOs with positive long run returns some companies perform remarkably higher than others. Also, for IPOs with negative returns, some performed extremely poor. As such, companies were grouped into four categories namely; companies with high positive returns, companies with average positive returns, companies with poor

negative returns and companies with very poor negative returns. The interpretations of the returns are provided below (Table 7.17).

Table 7.17: Interpretation of ratings on the grouped absolute and grouped relative returns

IPO long run Returns	Description
Greater than 50%	High positive returns
Between 0% and 50%	Average positive returns
Between -50% and 0%	Poor negative returns
Less than -50%	Very poor negative returns

Table 7.17 shows the four groups of IPO returns and their description. The long run returns of each IPO will fall in only one of the above groups. For example, a company with a long run return greater than 50% will be classified as having high positive returns while a company with long run returns less than -50% will be classified as having very poor long run returns.

7.5.1.1. Descriptive statistics of grouped absolute and relative returns

In order to find out how well the individual companies performed, Figure 7.1 on grouped absolute and grouped relative returns provides some possible explanations.

Figure 7.1: Descriptive statistics of grouped absolute and relative returns

Grouped absolute and relative Returns

	High positive returns	Average positive returns	Poor negative returns	Very poor negative returns
Absolute returns	17.70%	7.42%	16.13%	58.71%
Relative returns	9.03%	5.16%	12.58%	73.23%
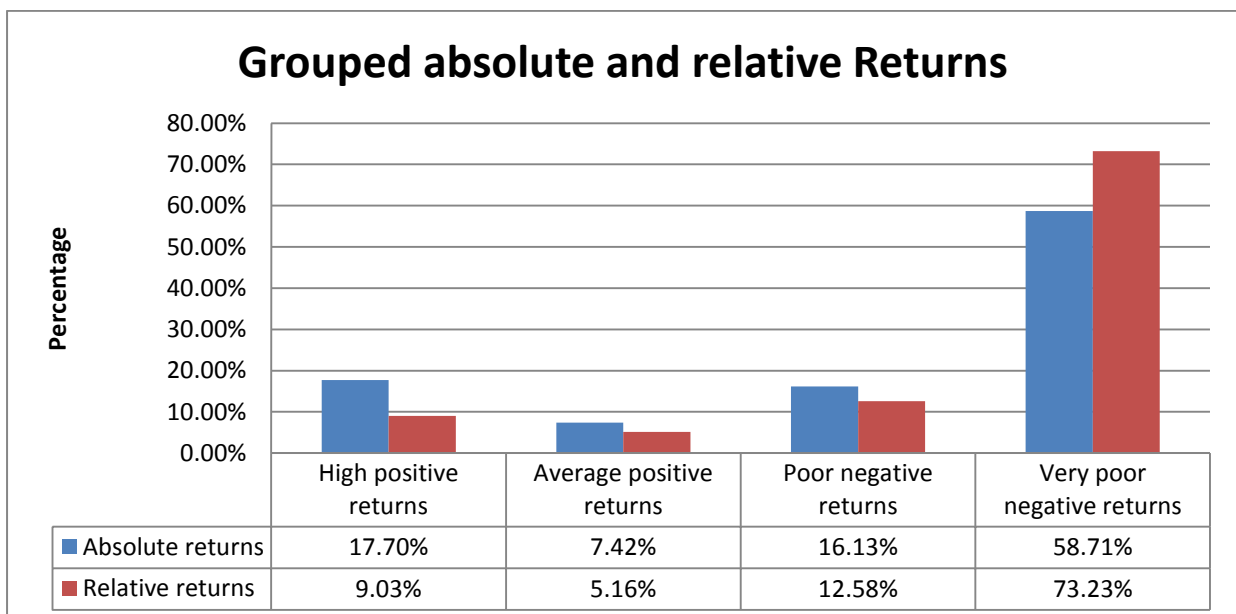
The results on Figure 7.1 depict that for both the grouped absolute and relative returns (58.71% and 73.23% respectively), IPOs on the JSE have very poor negative returns. Also evident is that 17.74% of the companies have high positive absolute returns while only 9.03% have high positive relative returns. These results depict that the majority of IPOs on the JSE generally have poor long run returns (both in absolute and relative terms). Researchers (Loughran & Ritter, 1995:23; Govindasamy, 2010:42; Bessler & Thies, 2007) observed that investors earned poor long term returns which are consistent with the findings of this study. Furthermore, the results from Table 7.17 and Figure 7.1 indicate that the poor average long run returns on the JSE can be explained by the fact that more than 50% of the companies have very negative returns. However, the fact that some companies still have high positive returns (17.7% and 9.03% for absolute and relative returns respectively) is a good indication that IPOs can be a good investment.

7.5.2. Descriptive statistics of absolute and relative returns, and grouped absolute and relative returns based on IPO characteristics

In this section the descriptive statistics for absolute and relative returns, and grouped absolute and relative returns based on each IPO characteristic will be provided. Also, ANOVA will be conducted to determine if there is any significant difference in absolute and relative returns and IPO characteristics. Chi square will be used to find out if there is any significant relationship between the grouped absolute and relative returns and IPO characteristics.

ANOVA is a specific type of regression analysis that uses the quantitative predictors to act as categorized predictors. ANOVA is used to determine if the mean dependent variable score obtained in the experimental condition differ significantly. This can be achieved by finding out what proportion of variation in the dependent variable can be attributed to the manipulation of the experimental variables (Rutherford, 2001:5-6). Cooper and Schindler (2001:499) state that chi-square tests the "differences between observed distribution of data amongst categories and the expected distribution based on the null hypothesis (Ho)". Chi-Square is important when evaluating the significance of relationships in which the interest is based on the number of participants that fall in a specified category. In this study, absolute and relative returns were categorized into four groups (high positive returns, average positive returns, poor negative returns and very poor negative returns). The Chi-square test will be used to find if the different characteristics can significantly determine variations in IPO returns for the different groups.

7.5.2.1. Absolute and relative returns, and grouped absolute and relative returns based on market period

It is well documented that IPO markets follow cyclical patterns with dramatic swings, often called hot and cold markets (Ibbotson & Jaffe, 1975; Helwege & Liang, 2002). In this study a hot and cold market is differentiated based on the number of IPOs issued during those periods (seen on Table 7.4 above).

Table 7.18: Descriptive statistics of absolute and relative returns based on market period

	Absolute return	Relative return
Hot market period	-39.97%	-95.95%
Cold market period	120.59%	13.18%

From Table 7.18 it is observed that during the cold market period, IPOs receive positive absolute and relative returns (120.59% and 13.18%) over a 5 year period. During the hot market period, IPOs gave negative absolute and relative returns (-39.97% and -95.95% respectively). These results indicate that the returns earned from IPOs issued during hot markets were worse than those earned by IPOs issued during cold markets over a 5 year period. These findings are consistent with other studies (Cook *et al.,* 2003; Govindasamy, 2010:42) which established that the returns IPOs earned during hot markets were worse than those earned by IPOs issued during cold markets. In contrast, Schuster (2003:3) established that IPOs issued during the hot market had the better absolute and relative returns in the long run while IPOs issued during the cold market period experienced poorer absolute and relative returns.

In establishing whether there are any significant relationships between market periods and absolute and relative long run returns, an ANOVA was performed.

Table 7.19: ANOVA: Absolute and relative returns based on market periods

		Sum of Squares	df	Mean Square	F	Sig.
Absolute Return	Between Groups	130.918	1	130.918	29.986	.000
	Within Groups	1344.735	308	4.366		
	Total	1475.653	309			
Relative Return	Between Groups	60.485	1	60.485	14.582	.000
	Within Groups	1277.530	308	4.148		
	Total	1338.015	309			

The results from Table 7.19 show that there is a significant difference in the absolute and relative returns based on their market period as F=29.986; p<0.001 (for absolute return) and as F=14.582; p<0.001 (for relative return). The significant relationship between the absolute and relative returns and the market period clearly supports the views from existing studies (Cook *et al.,* 2003; Shikha & Balwinder, 2008) that hot market IPOs performed worse in the long run than IPOs issued in the cold market period.

The grouped returns will provide further insight into this trend by indicating the percentage of hot and cold market IPOs with negative and positive long run returns.

Figure 7.2: Descriptive statistics of grouped absolute and relative returns based on market period

Grouped absolute and relative returns categorised by Market period

	Cold market - Absolute returns	Hot market - Absolute returns	Cold market - relative returns	Hot market - relative returns
■ Very poor negative returns	35.94%	64.63%	51.56%	78.86%
■ Poor negative returns	10.94%	17.48%	17.19%	11.38%
■ Average positive returns	9.38%	6.91%	9.38%	4.07%
■ High positive returns	43.75%	10.98%	21.88%	5.69%
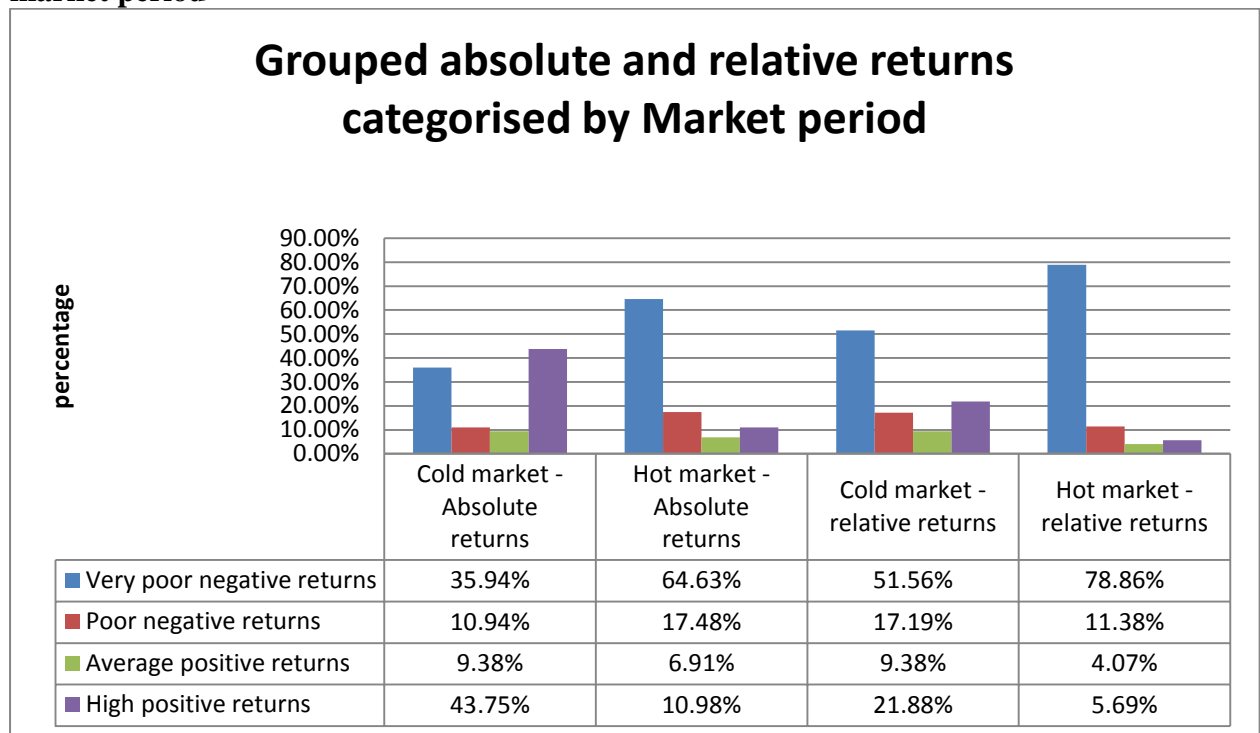
The results on Figure 7.2 illustrate that a significant number of IPOs issued during the cold market period have high positive returns both in grouped absolute and relative terms (43.75% and 21.88% respectively) and very poor negative return (35.94% and 51.56% respectively). For IPOs issued during the hot market period up to 64.63% and 78.86% (for absolute and relative returns respectively) of companies have very poor negative returns and only 10.98% and 5.69% (for absolute and relative returns respectively) of companies have high positive returns. Furthermore, also observed is that more companies have a poor negative returns than average positive returns during the hot and cold market periods. These results indicate a possibility that IPOs issued during the hot versus cold market periods can actually be used to predict some trends on the long run returns. It thus becomes imperative to find out if there is a relationship between IPOs issued during the hot and cold market periods and future returns. In establishing whether there are any significant relationships between market periods and grouped absolute and grouped relative long run returns, a chi-square was performed.

Table 7.20: Chi Square: grouped absolute and relative returns based on market periods

	Grouped absolute returns			Grouped relative returns		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.635[a]	3	.000	24.031[a]	3	.000
Likelihood Ratio	34.474	3	.000	21.099	3	.000
Linear-by-Linear Association	35.176	1	.000	23.876	1	.000
N of Valid Cases	310			310		

The results from Table 7.20 show that the chi-square test statistic value for the grouped absolute returns is 39.635 with the associated p-value less than 0.001. The chi-square test statistic value for the grouped relative returns is 24.031 with the associated p-value less than 0.001. Since both the associated p-values are less than 0.05, it is concluded that there is a statistically significant relationship between the grouped absolute and relative returns and the market periods, with a majority of hot market IPOs more likely to have poor absolute and relative returns than cold market IPOs. Other studies (Cook *et al*., 2003; Govindasamy, 2010:42) have highlighted that the returns companies earned during hot markets were worse than those earned by cold market IPOs. This possibly explains why a higher percentage of IPOs listed in the hot market period earn worse long run returns than companies listed in the cold market period.

7.5.2.2. Absolute and relative returns, and grouped absolute and relative returns based on Industry

This study classified the industries into four main sectors (industrial, financial, technology and others) as used by Govindasamy (2010:45-46) and Van Heerden, and Alagidede (2012) in their studies on the JSE.

Table 7.21: Descriptive statistics of absolute and relative returns based on industry

	Mining	Financial	Technology	Others
Absolute returns	-8.66%	1.31%	54.23%	9.57%
Relative returns	-69.01%	-70.31%	-114.21%	-59.49%

The results in Table 7.21 depict that across all four industry sectors, all the relative returns are negative over five years. Also, only the mining sector (-8.66%) has a negative absolute return. In establishing whether there are any significant relationships between the industry and absolute and relative long run returns, an ANOVA was performed.

Table 7.22: ANOVA: absolute and relative returns based on industry

		Sum of Squares	df	Mean Square	F	Sig.
Absolute Return	Between Groups	18.848	3	6.283	1.320	.268
	Within Groups	1456.804	306	4.761		
	Total	1475.653	309			
Relative Return	Between Groups	13.746	3	4.582	1.059	.367
	Within Groups	1324.270	306	4.328		
	Total	1338.015	309			

The ANOVA results in Table 7.22 depict that for absolute return F=1.320; p= 0.268 and for relative returns F=1.059; p= 0.367, which shows that there is no significant relationship between IPO absolute and relative returns in the different industries.

Figure 7.3: Descriptive statistics of grouped absolute and relative returns based on Industry

Grouped absolute and relative returns categorised by Industries

	Mining - Absolute returns	Financial - Absolute returns	Technology - Absolute returns	Others- - Absolute returns	Mining - Relative return	Financial - Relative returns	Technology - Relative returns	Others- - Relative returns
■ Very poor negative returns	55.56%	57.15%	71.43%	54.94%	63.89%	79.59%	82.54%	69.74%
■ Poor negative returns	8.33%	22.45%	17.46%	15.43%	19.45%	8.17%	12.70%	12.35%
■ Average positive returns	13.89%	10.20%	3.17%	6.79%	8.33%	6.12%	1.59%	5.56%
■ High positive returns	22.22%	10.20%	7.94%	22.84%	8.33%	6.12%	3.17%	12.35%

Figure 7.3 displays the results on the grouped absolute and grouped relative returns based on industries. With regards to the grouped absolute and relative returns, it is established that the trend is similar across all four sectors (i.e. more IPO companies earn very poor negative absolute and relative return). The technology and financial sectors are the two sectors that have very poor negative absolute and relative returns, and also poor average positive absolute and relative return. Govindasamy (2010:47) found that technology and financial sectors (-113.24% and -81.77%) had negative returns in the long run, which is consistent with the findings of this study. In establishing whether there are any significant relationships between industry and grouped absolute and grouped relative long run returns, a chi-square was performed.

Table 7.23: Chi square: grouped absolute and relative returns based on Industry

	Grouped absolute returns			Grouped relative returns		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.821[a]	9	.052	11.068[a]	9	.271
Likelihood Ratio	17.782	9	.038	12.097	9	.208
Linear-by-Linear Association	.385	1	.535	.670	1	.413
N of Valid Cases	310			310		

The results from Table 7.23 depict that the chi-square test statistic value for the absolute returns is 16.821 with the associated p-value greater than 0.05. The chi-square test statistic value for the relative returns is 11.068 with the associated p-value greater than 0.05. Since both the associated p-values are greater than 0.05, it is concluded that there is no statistically significant relationship between the grouped absolute and relative returns and the industry.

7.5.2.3. Absolute and relative returns, and grouped absolute and relative returns based on gross proceeds (Size of the IPO)

The size of the issue (gross proceeds) has been recognized widely as an important determinant of IPO returns (Kooli & Suret, 2002; Drobetz *et al.,* 2005). Gross proceeds were calculated as the offer price at IPO multiplied by the number of shares issued.

Table 7.24: Descriptive statistics of absolute and relative returns based on gross proceeds

	< R200M	R200M-R500M	>500M
Absolute returns	-17.17%	9.70%	-4.34%
Relative returns	-87.69%	-55.24%	-66.30%

The results on Table 7.24 show that only companies that have gross proceeds between R200m and R500m showed a positive absolute return (9.70%). Also, the relative returns are negative based on all the three classifications of gross proceeds (less than R200m, between R200m and R500m and greater than R500m). In establishing whether there are any significant relationships between gross proceeds and absolute and relative IPO long run returns, an ANOVA was performed.

Table 7.25: ANOVA: absolute and relative returns based on gross proceeds

ANOVA: absolute and relative returns based on gross proceeds		Sum of Squares	df	Mean Square	F	Sig.
Absolute Returns	Between Groups	3.624	2	1.812	.378	.686
	Within Groups	1472.029	307	4.795		
	Total	1475.653	309			
Relative Returns	Between Groups	5.842	2	2.921	.673	.511
	Within Groups	1332.173	307	4.339		
	Total	1338.015	309			

The ANOVA results in Table 7.25 depict that for absolute returns F=0.378; p=0.686 and for relative returns F=0.67.; p=0.511, which show that there is no significant relationship between the absolute and relative returns and gross proceeds.

Figure 7.4: Descriptive statistics of grouped absolute and relative returns based on gross proceeds

	< R 200M- Absolute returns	R200M- R500M- Absolute returns	> R500M- Absolute returns	< R 200M- Relative returns	R200M- R500M- Relative returns	> R500M- Relative returns
Very poor negative returns	69.72%	57.33%	43.01%	83.80%	66.66%	62.37%
Poor negative returns	16.20%	10.67%	20.43%	9.15%	12.00%	18.28%
Average positive returns	3.52%	8.00%	12.90%	1.42%	10.67%	6.45%
High positive returns	10.56%	24.00%	23.66%	5.63%	10.67%	12.90%
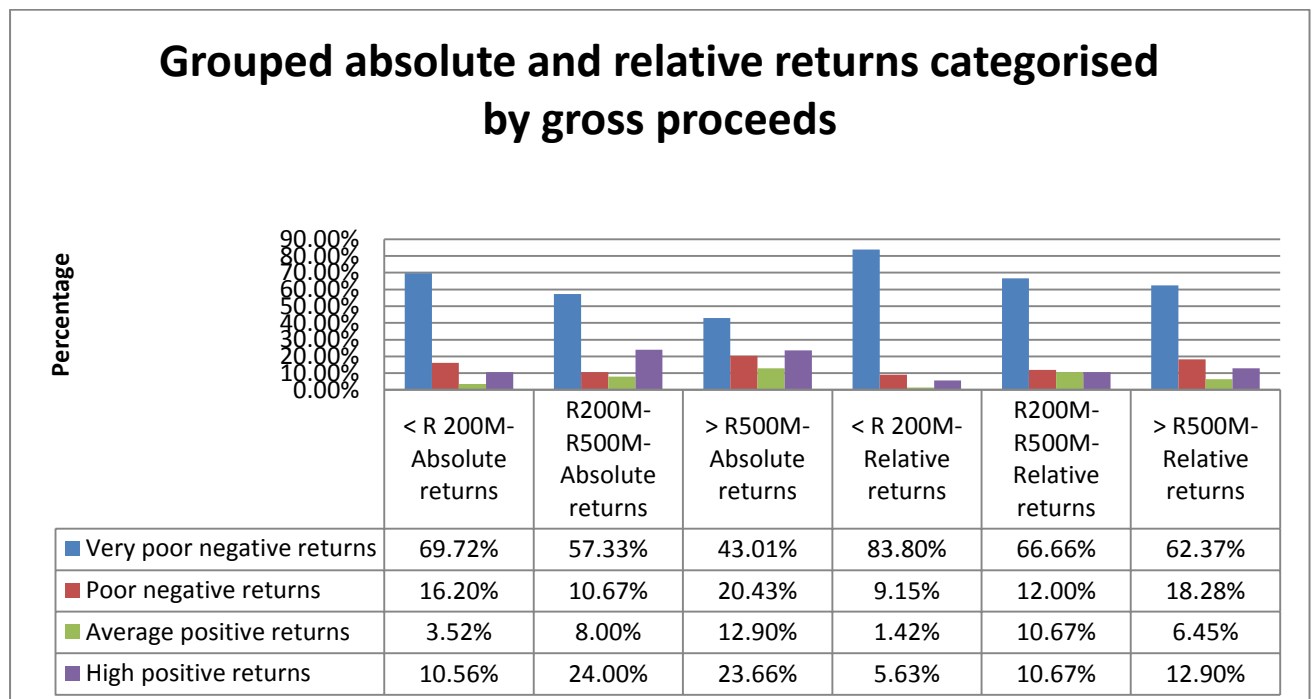
Figure 7.4 illustrates the results of the grouped absolute and relative returns categorized by gross proceeds. The results indicate that for both the grouped absolute and relative returns, a higher percentage of companies with gross proceeds less than R200million have very poor negative returns compared to companies with higher gross proceeds. It is also evident from the results that a smaller percentage of companies with gross proceed less than R200million

have positive long run returns compared to companies with a higher gross proceed. This finding suggests that companies with smaller gross proceeds provide worse long run returns than those with higher gross proceeds. Similarly, some studies (Drobetz et. al., 2005; Govindasamy, 2010: 57-58) have established that companies with smaller gross proceeds had worse relative returns in the long run than larger companies. The significance of this relationship is indicated in the Chi-square test on table 7.26.

Table 7.26: Chi Square: grouped absolute and relative returns based on gross proceeds

	Grouped absolute return			Grouped relative returns		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.639[a]	6	.001	20.013[a]	6	.003
Likelihood Ratio	24.367	6	.000	20.460	6	.002
Linear-by-Linear Association	17.013	1	.000	11.526	1	.001
N of Valid Cases	310			310		

The results from Table 7.26 on the chi square show that the chi-square test statistic value for the grouped absolute returns is 23.639 with the associated p-value less than 0.05. The chi-square test statistic value for the relative returns is 20.013 with the associated p-value less than 0.05. Since both the associated p-values are less than 0.05, it is concluded that there is statistically significant relationship between the grouped absolute and relative returns and gross proceeds. These results are in line with those of Drobetz *et al*., (2005) and Govindasamy, (2010:57-58) who also established in their research that companies with smaller gross proceeds had poorer relative returns in the long run than larger companies. Brav and Gompers (1997) discovered that most institutional investors are usually not significantly hurt by investing in IPOs since they do not buy the small issues that have been identified to have worse long run returns. In contrast, Cai *et al.* (2008) established that companies with smaller gross proceeds in China showed better returns than companies with larger gross proceeds.

When looking at the results on both the absolute and relative returns and grouped absolute and relative returns, it is clear that while the results on the absolute and relative returns are not statistically significant; the results on the grouped absolute and relative returns are statistically significant. While gross proceeds cannot explain the absolute and relative returns,

it is still vital for investors to consider gross proceeds since it significantly predicts the grouped absolute and relative returns. This can have a significant impact on the investor's decision making as an investor will not invest in IPOs with smaller gross proceeds knowing that the chances of very bad returns are significantly higher.

7.5.2.4. Absolute and relative returns, and grouped absolute and relative returns based on the company's age

The age of the company has been considered a determinant of IPO returns by several studies (Younesi *et al.,* 2012:141; Ahmad-Zaluki & Abiding, 2011:322). A company's age prior to going public was measured by subtracting the year of founding/incorporation of the business from the year it went public.

Table 7.27: Descriptive statistics of absolute and relative returns based on the company's age

	< 1 years	1-2 years	3- 5 years	6-10 years	>10 years
Absolute returns	-52.44%	-26.15%	69.43%	-10.59%	13.39%
Relative returns	-120.91%	-93.10%	17.16%	-62.35%	-63.67%

From Table 7.27 it is established that companies that are found between the age groups of three to five years have positive returns both in absolute and relative terms. Also companies that are older than ten years have a positive absolute return. Companies found between the age groups less than one year, one to two years and six to ten years have negative absolute and relative returns over a five year period. In establishing whether there are any significant relationships between a company's age and absolute and relative IPO long run returns, an ANOVA was performed.

Table 7.28: ANOVA: absolute and relative returns based on the company's age

ANOVA: absolute and relative returns based on the company's age					
	Sum of	**df**	**Mean**	**F**	**Sig.**

		Squares		Square		
Absolute Return	Between Groups	41.153	4	10.288	2.187	.070
	Within Groups	1434.500	305	4.703		
	Total	1475.653	309			
Relative Return	Between Groups	48.548	4	12.137	2.871	.023
	Within Groups	1289.467	305	4.228		
	Total	1338.015	309			

The results from Table 7.28 show that $F=2.187$; $p=0.070 > 0.05$ (for absolute return) and as $F=2.871$; $p<0.05$ (for relative return). The result depicts that while there is no significant relationship between the absolute returns and a company's age, there is however, a significant relationship between the relative returns and a company's age. These results are contrary to the study by Goergen *et al.* (2007:402) who did not find a statistically significant relationship between the age of a company and its long run relative returns. Shikha and Balwinder (2008:1) also established that a company's age had no significant relationship with long run returns. Their results showed that the relationship between age and returns was inconsistent as within the first three years, age showed an inverse relationship with returns, while for the fourth and fifth year, age showed a direct relationship with returns (resulting in a 'V' shaped graph over the five year period). As such it was inconclusive in determining which trend is dominant thus resulting to the conclusion that age had no significant relationship with long run returns.

Figure 7.5: Descriptive statistics of grouped absolute and relative returns based on the company's age

Grouped absolute and relative returns categorised by Age

	< 1 years-Absolute returns	1-2 years-Absolute returns	3-5 years-Absolute returns	6-10 years-Absolute returns	> 11 years-Absolute returns	< 1 years-Relative returns	1-2 years-Relative returns	3-5 years-Relative returns	6-10 years-Relative returns	> 11 years-Relative returns
■ Very poor negative returns	69.23%	57.15%	75.00%	62.50%	44.57%	83.08%	72.73%	75.00%	70.00%	67.39%
■ Poor negative returns	18.46%	19.48%	2.78%	12.50%	18.48%	12.31%	18.18%	11.11%	7.50%	10.87%
■ Average positive returns	4.62%	5.19%	8.33%	7.50%	10.87%	3.08%	3.90%	5.56%	10.00%	5.43%
■ High positive returns	7.69%	18.18%	13.89%	17.50%	26.09%	1.54%	5.19%	8.33%	12.50%	16.30%

From Figure 7.5 it is established that across the different age groups, most companies generate very poor negative returns. Also, for the companies that are less than one year, the percentage of IPOs with a positive return (for both absolute and relative returns) is the smallest. Companies that are older than ten years have the highest percentage of IPOs with high positive returns (26.09% and 16.30%) for both absolute and relative returns respectively. These results indicate that while companies that are less than one year have poor long run returns, companies older than ten years have high positive long run returns. Moreover, companies found between the age groups of one to two years; three to five years and six to ten years do not show any noticeable trend (for poor negative returns and average positive returns). Ritter (1991) established that younger companies had very poor long run returns than more established companies, which is consistent with the findings of this study. In establishing whether there are any significant relationships between a company's age and grouped absolute and grouped relative IPO long run returns, a chi-square was performed.

Table 7.29: Chi square: grouped absolute and relative returns based on the company's age

	Grouped absolute returns			Grouped relative returns		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.835[a]	12	.039	18.245[a]	12	.108
Likelihood Ratio	24.557	12	.017	19.145	12	.085
Linear-by-Linear Association	10.908	1	.001	10.940	1	.001
N of Valid Cases	310			310		

The results from Table 7.29 illustrate that the chi-square test statistic value for the grouped absolute returns is 21.835 with the associated p-value (0.039) less than 0.05. The chi-square test statistic value for the grouped relative returns is 18.245 with the associated p-value (0.108) greater than 0.05. Since the associated p-value of grouped absolute returns is less than 0.05, it is concluded that there is a statistically significant relationship between the grouped absolute returns and a company's age. Also, since the associated p-values of the grouped relative returns is greater than 0.05, it can be concluded that there is no statistically significant relationship between the grouped relative returns and a company's age.

When looking at the results on both the absolute and relative returns and grouped absolute and relative returns, it is seen that while there is no significant relationship between the absolute returns and a company's age, there is a significant relationship between the relative returns and a company's age. Also, while there is a significant relationship between grouped absolute returns and a company's age, there is however no relationship between the grouped relative returns and a company's age.

7.4.2.5. Absolute and relative returns, and grouped absolute and relative returns based on initial share price movements

In predictability of stock returns of IPOs, the initial share price movements over a fixed holding period such as a day, a week or a month is usually used. Moving averages (MA) are usually the best way to detect trends, and changes in share prices over a fixed holding period (in this case the first month). Moving averages are the average price of a security over a

specific time interval that is continually updated. In this study we calculated the five days moving average for each IPO over a period of one month (specifically its first trading month). The formula is given by

$$MA = \sum_{k=1}^{days} \frac{\text{Price on day}_k}{\text{Number of days}}$$

The result on the descriptive statistics on returns based on initial share price movement is presented on table 7.30 below.

Table 7.30: Descriptive statistics of absolute and relative returns based on initial share price movement

	Downtrend	Uptrend	Unstable trend
Absolute returns	-11.14%	2.92%	-5.06%
Relative returns	-72.72%	-78.92%	-66.10%

From Table 7.30 it is observed that only the companies with an initial upward trend in share price movements show a positive absolute return (2.92%). Also, companies with downward and unstable trend have a negative absolute and relative return. Unstable trends are IPO companies that have a reoccurring up and down trend. These results indicate that there is no apparent trend dominating. In establishing whether there are any significant relationships between initial share price movement and absolute and relative IPO long run returns, an ANOVA was performed.

Table 7.31: ANOVA: absolute and relative returns based on initial share price movement

ANOVA: absolute and relative returns based on initial share price movement						
		Sum of Squares	df	Mean Square	F	Sig.
Absolute Return	Between Groups	1.111	2	.555	.116	.891
	Within Groups	1474.542	307	4.803		
	Total	1475.653	309			
Relative Return	Between Groups	.460	2	.230	.053	.949
	Within Groups	1337.555	307	4.357		
	Total	1338.015	309			

The ANOVA results in Table 7.31 depict that for absolute return F= 0.116; p= 0.891 and for relative returns F=0.053.; p= 0.949, which shows that there is no significant relationship between absolute and relative returns and the initial share price movement.

Figure 7.6: Descriptive statistics of grouped absolute and relative returns based on initial share price movement

Grouped absolute and relative returns categorised by initial share price movement

	Downtrend - Absolute return	Uptrend - Absolute return	Unstable trend - Absolute return	Downtrend-Relative returns	Uptrend-Relative returns	Unstable trend-Relative returns
Very poor negative returns	62.50%	51.28%	55.00%	76.04%	70.51%	65.00%
Poor negative returns	17.19%	16.67%	10.00%	11.98%	12.82%	15.00%
Average positive returns	6.25%	8.97%	10.00%	5.21%	3.85%	7.50%
High positive returns	14.06%	23.08%	25.00%	6.77%	12.82%	12.50%

Figure 7.6 displays the results for the actual absolute and relative returns categorized by initial share price movement. When looking at both the absolute and relative returns, it is seen that a high percentage of companies with a downward trend in the initial share price movement have very poor long run returns while a smaller percentage have high positive returns when compared to companies with an upward or unstable trend. However, for the companies with an upward or unstable trend, the difference in the percentage of companies with high positive returns is comparatively small. In order to determine if there is a significant relationship between the initial share price movement and grouped long run returns, a chi-square test is performed and the results are presented in Table 7.32.

Table 7.32 : Chi square: grouped absolute and relative returns based on initial share price movement

	Grouped absolute returns			Grouped relative returns		
	Value	df	Asymp. Sig. (2-sided)	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.247[a]	6	.299	4.446[a]	6	.617
Likelihood Ratio	7.253	6	.298	4.324	6	.633
Linear-by-Linear Association	4.808	1	.028	3.118	1	.077
N of Valid Cases	310			310		

The results from Table 7.32 show that the chi-square test statistic value for the grouped absolute returns is 7.247 with the associated p-value greater than 0.05. The chi-square test statistic value for the grouped relative returns is 4.446 with the associated p-value greater than 0.05. Since both the associated p-values are greater than 0.05, it is concluded that there is no statistically significant relationship between the grouped absolute and relative returns and the initial share price movements.

7.5.5.2. Conclusion on descriptive statistics on IPO returns and IPO characteristics

This section examined the descriptive statistics of absolute and relative returns based on IPO characteristics. ANOVA and chi-square tests were performed to find out if there are any significant relationships between IPO long run returns and selected IPO characteristics. The results on the absolute and relative returns revealed that the average returns for absolute and relative returns were both negative in the long run. The results on the grouped absolute and relative returns established that both the grouped absolute and relative returns were negative in the long run. These findings indicate that IPOs on the JSE generally had poor long run returns (both in absolute and relative terms). The summary of significant relationships identified between absolute and relative returns and grouped absolute and relative returns and IPO characteristics (market periods, gross proceeds, company's age, industry and initial share price movement) is presented in Table 7.33 below.

Table 7.33: Conclusion on descriptive statistics on IPO returns and IPO characteristics absolute and relative, and grouped absolute and relative returns

	ANOVA analysis		Chi-square	
IPO characteristics	**Absolute return**	**Relative return**	**Grouped absolute return**	**Grouped relative return**
Market period	significant	significant	significant	significant
Industry	-	-	-	-
Gross proceeds	-	-	significant	significant
Company's age	-	significant	significant	-
Initial share price movement	-	-	-	-

From the Table 7.33, it is observed that market period (hot and cold markets) is the only factor that has a significant relationship between absolute and relative, and grouped absolute and relative returns. Gross proceeds have a significant relationship with grouped absolute and relative returns. Moreover, age has a significant relationship with the relative returns, and grouped absolute returns. Based on these results, it can thus be concluded that market period is predominantly a key determinant of IPO long run returns on the JSE, alongside the gross proceeds and the company's age.

7.5.3. Pre-financial ratios and market related characteristics

The pre-financial ratios and market related characteristics identified by this study are the current ratio, quick ratio, operating profit margin, net profit margin, return on assets (ROA), return on equity (ROE), price to earnings ratio (P/E), market to book value (M/B), total asset turn over and debt to equity ratio. The main goal here is to determine if the pre-financial information available to an investor prior to the offering can be used to predict the long run returns of IPOs listed on the JSE. Given that these financial variables are so many, a principal component analysis (PCA) is used to reduce the number of variables and extract the most relevant components. Cooper and Schindler (2003:591) define PCA as a multivariate statistical method that can be used to examine inter-relationships among a large number of variables and to elucidate these variables in terms of their common underlying factor. Also, PCA is used for data reduction found in a number of original variables into a smaller set of factors with a minimum loss of information and for detection of structure for the underlying

factors in a set of variables. Andersson and Westling (2009:16) elucidate that when extracting the relevant components so as to reduce the number of variables, the Kaiser-Meier-Olkin-measure (KMO) should be used to determine whether the PCA is appropriate. According to Skogsvik (2002) and Andersson and Westling (2009:16) the KMO measure ranges between 0 and 1. Where a KMO≥0.9 is defined as "marvelous" and 0.8≤KMO<0.9 is defined as "meritious", 0.7≤KMO<0.8 is defined as "middling" and 0.6≤KMO<0.7 is defined as "mediocre". Moreover 0.6≤KMO<0.5 is defined "miserable" and KMO<0.5 is defined as unacceptable.

In the PCA, components with an eigenvalue (eigenvalue for a given component designates the variance of all the variables for that component) greater or equal to 1 were extracted. Also the dependent variables were left out and only the relations between the independent variables were taken into account. The results on the eigenvalue are presented on Table 7.23 below.

Table 7.34: Total Variance Explained by the Eigenvalues

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative variance %	Total
1	2.511	25.114	25.114	2.255
2	1.938	19.378	44.492	1.888
3	1.307	13.070	57.562	1.260
4	1.143	11.426	68.988	1.246
5	1.097	10.973	79.961	1.808
6	.718	7.179	87.140	
7	.556	5.558	92.697	
8	.368	3.684	96.381	
9	.201	2.007	98.388	
10	.161	1.612	100.000	

Extraction Method: Principal Component Analysis.

The results from Table 7.34 show that the number of extracted components in the analysis was five. These extracted components accounted for 79.96% of the variation in the total sample (cumulative variance). The extraction communalities, estimates of the variance in each variable were high, demonstrating that the extracted components characterize the variables well. The results also illustrate that the eigenvalue for each factor was greater than 1, indicating that it contributes to the explanation of the variance for the chosen components.

In order to establish which variables each component represents, the components are rotated using the Direct Oblimin method and the Varimax methods (Skogsvik, 2002; Andersson & Westling 2009:36). Andersson and Westling (2009:36) view the Direct Oblimin method as a non-orthogonal (oblique) process that sets the delta-value at zero as a maximum correlation of the components, while the Varimax procedure is an orthogonal method which minimizes the number of variables with high loadings on a factor. Both the Direct Oblimin method and the Varimax procedures were conducted, and the resulted showed that the same variables were chosen for each component. Therefore, in this study only the Rotated Structure Matrix according to Direct Oblimin is reported. The results are presented in Table 7.35 below;

Table 7.35: Rotated Components with the Direct Oblimin Method

Financial ratios	**Components**				
	1	2	3	4	5
Current Ratio	**0.923**	0.007	0.102	-0.038	-0.181
Quick Ratio	**0.915**	-0.057	0.101	-0.169	-0.204
Operating Profit Margin	0.223	0.173	0.092	-0.398	**-0.824**
Net Profit Margin	-0.082	**0.951**	-0.028	-0.010	-0.141
Return on Assets	0.208	0.093	0.058	0.232	**-0.859**
Return on Equity	0.014	**0.942**	-0.035	-0.004	-0.097
Price earnings ratio	0.210	0.179	**0.571**	-0.321	-0.392
Market to book value	0.046	-0.145	**0.863**	0.087	0.004
Total Assets Turnover	-0.106	0.029	-0.007	**0.938**	0.027
Debt to equity ratio	**-0.639**	0.039	0.394	0.121	0.366

Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

From Table 7.35 the KMO measure used in this study was 0.81. Based on the KMO measure, it is established that five ratios (current ratios, quick ratio, net profit margin, ROE and total asset turnover) are found in the marvelous criteria (KMO≥0.9); three ratios (operating profit margin, ROA and M/B) are found in the meritious (0.8≤KMO<0.90); and debt to equity ratio is found in the mediocre criteria (0.6≤KMO<0.70). Furthermore, it is observed that in Component 1, the correlation is high for the current ratio (0.923), quick ratio (0.915) and debt to equity ratio (0.639). In Component 2, the correlation is high for the net profit margin (0.951) and ROE (0.942). In Component 3, the correlation is high for as P/E (0.571) and M/B (0.863). In component 4, the correlation is high for total asset turnover (0.938). In component 5, the correlation is high the ROA (-0.859) and operating profit margin (-0.824).

From each of the financial ratios and market related characteristics (P/E and MBV) identified in the five components, only the ratios that have a KMO measure of more than 0.81 will be considered. Based on the financial ratios and market related characteristics identified, it is observed that the ratios with the highest correlations (greater than 0.81) are the current ratio (0.923) and quick ratio (0.915) for component 1; net profit margin (0.951) and ROE (0.942) for component 2; M/B (0.863) for component 3; total asset turnover (0.938) for component 4 and operating profit margin (-0.824) and ROA (-0.859) for component 5, and these ratios can be used to explain most of the variance of the tested financial ratios. These chosen market related characteristics and financial ratios will be used in regression analysis along with the other IPO characteristics to test if there are any significant relationships between them and IPO long run returns.

7.5.4. Cross sectional analysis linking IPO characteristics IPO long run returns

In establishing whether there are any significant relationships between each IPO characteristic and IPO long run returns, cross sectional analysis using statistical analysis such as regression analysis (univariate regression analysis and the multivariate regression analysis) and structural equation modeling were performed.

7.5.4.1 Regression analysis

Regression refers to a statistical technique which is used to analyse models consisting of a dependent and one or more independent variables. The dependent variable is also known as the response variable while the independent variable is also known as the explanatory or predictive variable. In order to perform a regression analysis, a model is developed in which the dependent variable is presented as a function of the independent (explanatory) variable. The model also contains fixed coefficients and an error term which indicates the unexplained disparities in the dependent variable. In this study, two types of regression models are used: **the univariate regression analysis and the multivariate regression analysis**. The independent variables that will be used for regression analysis are summarized in Table 7.36 below.

Table 7. 36: Abbreviations used in the regression equation

Variable name abbreviation used in regression equation	Variable definition
Age	Age of the company prior to going public
GP	The gross proceeds of the company
MP	The market period (hot/cold) in which the company was listed
CR	Current ratio
QR	Quick ratio
OP	Operating profit margin
NP	Net profit margin
ROA	Return on asset
ROE	Return on equity
MBV	Market to book value
TAT	Total asset turn over

7.5.4.1.1. Univariate Regression Analysis

Univariate regression analysis is important in determining the relationship of each individual explanatory factor with each of the dependent variables. With high information asymmetry investors sometimes have only limited information at the time of the IPO, and as such a univariate analysis will give an indication of which of these factors can individually explain significant variations in long run IPO returns. The linear regressions are shown in Equation 7.1 below.

The univariate regression analysis for IPO long run return is given as

$$IPO\_Returns_{t\_delist} = \alpha + \beta (X_i) + \varepsilon i \tag{7.1}$$

Where

$IPO\_Returns_{t\_delist}$ represents either the absolute or relative IPO long run returns and t_delist represents the five year period or the time of delisting from the JSE (whichever comes first).

X_i Represents each of the independent variables in table 7.36

Table 7.37: Univariate Regression analysis for IPO long run returns

Variables	Absolute Return		Relative Return		Grouped Absolute Return		Grouped Relative Return	
	Beta	T-Stat	Beta	T-Stat	Beta	T-Stat	Beta	T-Stat
Age	0.105	1.851**	0.099	1.577*	0.188	3.357***	0.188	3.362***
GP	0.029	0.515	0.049	0.857	0.235	4.236***	0.193	3.454***
MP	-0.298	-5.476***	-0.213	-3.819***	-0.337	-6.290***	-0.278	-5.079***
CR	-0.151	-2.608**	-0.078	-1.340	-0.213	-3.725***	-0.155	-2.673***
QR	-0.127	-2.189**	-0.082	-1.410	-0.205	-3.585***	-0.165	-2.860***
OP	-0.104	-1.673*	-0.065	-1.046	0.018	0.289	0.033	0.529
NP	0.127	2.051**	0.128	2.065**	0.195	3.188***	0.172	2.800***
ROA	-0.087	-1.494	-0.065	-1.121	-0.011	-0.180	0.047	0.801
ROE	0.099	1.742*	0.091	1.606	0.151	2.679***	0.111	1.961*
MBV	-0.125	-2.150**	-0.155	-2.669***	-0.020	-0.345	-0.073	-1.238
TAT	0.023	0.403	0.030	0.521	0.007	0.119	0.052	0.913

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.37 show the explanatory power of the different independent variables with regards to four classes (absolute returns, relative returns, grouped absolute returns and grouped relative returns) of IPO returns. The market period (MP) is seen to be the single factor that has a high predictive power for all the classes of IPO long run returns. It is also evident from the results that many of the predictive variables significantly affect the grouped returns as oppose to the actual returns. Furthermore, the results show that the absolute returns has a significant relationship with the market period (MP), market to book value (MBV), net profit margin (NP), operating profit margin (OP), quick ratio (QR), current ratio (CR) and return on equity (ROE). The relative returns have significant relationship with the market period (MP), firm age, market to book value (MBV), and the net profit margin (NP). This shows that fewer factors explain the relative returns as oppose to the absolute return. The market period shows a strong negative relationship with both absolute and relative returns. The negative coefficient (beta) for MP is consistent with other studies (Thomadakis *et al.,* 2011; Gounopoulos, 2011:19) and confirms the findings that the IPOs listed during the cold market period produce better returns in the long run. The Age and the NP have a significant positive relationship with both the absolute and relative long run returns. The CR, QR, OP and MBV show a significant negative relationship with the long run absolute returns.

The grouped absolute and relative returns have a significant relationship with the same factors. The factors that can be used to explain both the grouped absolute and relative returns

include: the market period (MP), the gross proceeds (GP), firm age, net profit margin (NP), quick ratio (QR), current ratio (CR), and the return on equity (ROE). The company's age, GP, NP, and ROE have a significant positive relationship with both the grouped absolute and relative returns. The MP, QR, and the CR have a significant negative relationship with the grouped IPO returns. Using the univariate regression, Hasan and Hadad (2013: 93) found that the operating profit margin and ROE had a significant relationship with initial IPO returns, while the current ratio had a significant relationship with initial IPO performance in the short run in Indonesia. Razafindrambinina and Kwan (2013:208) observed in their study that financial ratios such as ROA, current ratio, debt to equity ratio, and total asset turnover cannot be used to explain IPO returns. This study also confirms some of the findings by Razafindrambinina and Kwan (2013:208) as it was also established that the ROA and TAT could not be used to explain IPO returns. However, this study differs with regards to the current ratio.

7.5.4.1.2. Multivariate regression analysis

Although univariate regression analysis is valuable in demonstrating causal relationships, a wide evidence of economic and in particular IPO studies (Boulton *et al.,* 2010; Rashid *et al.,* 2012; Yang, 2012; Pang, 2011) have suggested that there exist multiple factors that can be used to influence dependent variables such as returns, performance and IPO success. In this section, various multiple regression models will be performed to get an overall view of factors that can be used to predict IPO long run returns. The first model will cover a comprehensive list of selected explanatory variables and the subsequent models will focus on each group of specific characteristics (firm characteristics, issue related characteristics, market related characteristics, and pre financial ratios).

The selection of explanatory factors for the multiple regression analysis was based on a series of primary analyses. The firm characteristics and the issue related characteristics were selected after performing a set of ANOVA and CHI-SQUARE analysis (subsection 7.5.2 above). The pre-financial ratios and market related factors were selected from the principal component analysis performed in (Table 7.35 above). A total of eleven factors were found suitable for the model as these factors were expected to affect the long run IPO returns.

7.5.4.1.2.1. Multivariate cross-sectional analysis for IPO long run returns based on selected factors

The equation of the multivariate cross-sectional analysis for IPO long run returns based on selected factors is given below;

$$IPO\_Returns_{t\_delist} = \alpha + \beta_1 Age_i + \beta_2 GP_i + \beta_3 MP_i + \beta_4 CR_i + \beta_5 QR_i + \beta_6 OP_i + \beta_7 NP_i + \beta_8 ROA_i + \beta_9 ROE_i + \beta_{10} MBV_i + \beta_{11} TAT_i + \varepsilon i \qquad (7.2)$$

Table 7.38: Multivariate cross-sectional analysis for based on selected IPO characteristics

Independent Variable	Dependent Variable: Long-term IPO returns			
	Absolute returns	Relative returns	Grouped Absolute returns	Grouped Relative returns
Intercept	1.931**	0.514	2.138***	1.950***
Age	0.106*	**0.101**	0.156**	0.141**
GP	-0.021	0.030	0.094	0.102
MP	-0.257***	-0.158**	-0.272***	-0.237***
CR	-0.134	-0.033	-0.061	-0.035
QR	0.022	-0.038	-0.086	-0.067
OP	-0.103	-0.066	0.012	-0.010
NP	0.134	0.130	0.156	0.202*
ROA	0.028	0.021	0.025	0.110
ROE	-0.039	-0.054	-0.025	-0.136
MBV	-0.076	-0.133**	0.008	-0.097
TAT	-0.10	0.017	-0.037	-0.007
R^2	0.136	0.087	0.192	0.153
Adjusted R^2	0.097	0.046	0.155	0.115
F-value	3.463***	2.102**	5.216***	3.987***
Durbin-Watson stat	1.839	1.821	2.064	1.987

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.38 show that the only factor which has a significant relationship with a both the absolute and relative returns and grouped absolute and relative returns is the market period (MP). This confirms results from a study by Shikha and Balwinder (2008) that found market condition (hot and cold market) to have a significant relationship with the initial returns and long run returns. Furthermore, three factors (market period, age, and the net profit margin) have a significant relationship with the grouped absolute and relative returns. The relative returns have a significant relationship with the market period and the market to book value (MBV) while the grouped relative returns have a significant relationship firm age and the market period. From these results, it is evident that only four main factors (**MP, Age,**

NP and MBV) emerge as significant explanatory variables for IPO long run returns. The MP and the MBV show a significant negative relationship with IPO returns while the company's age and the NP show a significant positive relationship with IPO returns. When comparing these results with the results from the univariate regression analysis, it is seen that while some factors (**QR, CR, NP and ROE)** might individually affect the IPO long run returns, when combined with other factors their effect is less significant.

The multivariate cross-sectional analysis for IPO long run returns identified the market period (MP), company's age, and market to book value (MBV) as the significant explanatory variables for IPO long run returns. It is however necessary to perform a multivariate cross-sectional analysis based on each individual grouping of IPO characteristics to determine which ones can have a predictive power when using a smaller multivariate regression model.

7.5.4.1.2.2. Multivariate cross-sectional analysis based on specific grouping of IPO characteristics.

The specific groupings of IPO characteristics are firm characteristics; issue related characteristics; market related characteristics and pre financial ratios.

7.5.4.1.2.2.1. Multivariate cross-sectional analysis for IPO long run return based on firm specific characteristics.

Three firm specific characteristics are used to develop a regression model for IPO long run returns. The market characteristics used are firm age, gross proceeds and the market period. The regression model for IPO long run returns is shown in equation (7.3) below

$$IPO\_Returns_{t\_delist} = \alpha + \beta_1 Age_i + \beta_2 GP_i + \beta_3 IND_i + \varepsilon i \qquad (7.3)$$

Where, IND refers to the industry.

Table 7.39: Multivariate cross-sectional analysis for IPO long run return based firm specific characteristics

Independent Variable	Dependent Variable: Long run IPO returns			
	Absolute returns	**Relative returns**	**Grouped Absolute returns**	**Grouped Relative returns**
Intercept	-0.575	-1.272***	0.907***	0.808***
Age	0.102*	0.091	0.137**	0.147**
GP	0.013	0.034	0.218***	**0.175***
IND(Industry)	0.035	0.032	0.077	0.080
R^2	0.092	0.012	0.080	0.065
Adjusted R^2	0.003	0.002	0.071	0.056

F-value	1.258	1.196	8.829***	7.112***
Durbin-Watson stat	1.760	1.859	1.794	1.740

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.39 show that for the firm specific characteristics, only the industry shows no significant relationship between the four classes of long run returns. This finding corresponds with the ANOVA findings (see subsection 7.5.2) and hence, it can be concluded that industry is not a significant predictor of IPO long run returns. The gross proceeds (GP) and firm age have a significant positive relationship with the grouped absolute and relative returns. The company's age was, however, found to a lesser extent to significantly affect the absolute returns. A study by Shikha and Balwinder (2008:1) established that a company's age had no significant relationship with long run returns which is contrary to the findings of this study.

7.5.4.1.2.2.2. Multivariate cross-sectional analyses for IPO long run return based issue related characteristics

The issue related characteristics used are the initial share price movements and the market period. The regression model for IPO long run returns is shown in equation (7.4) below

$$IPO\_Returns_{t\_delist} = \alpha + \beta_1 ISM_i + \beta_2 MP_i + \varepsilon i \qquad (7.4)$$

Where ISM refers to the initial share price movement

Table 7.40: Multivariate cross-sectional analyses for IPO long run return based issue related characteristics

Independent Variable	Dependent Variable: Long-term IPO returns			
	Absolute returns	Relative returns	Grouped Absolute returns	Grouped Relative returns
Intercept	1.111***	0.110	2.299***	1.812***
ISM	0.021	0.005	0.127**	0.102*
MP	-0.298***	-0.213***	-0.338***	**-0.279***
R^2	0.089	0.045	0.130	0.088
Adjusted R^2	0.083	0.039	0.124	0.082
F-value	15.024***	7.272***	22.934***	14.766***
Durbin-Watson stat	1.942	1.930	1.964	1.790

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.40 show that the market period (MP) has a significant negative relationship with all the four classes of IPO long run returns. This is consistent with earlier results established by the study. It is also seen that the initial share price movement has a significant positive relationship with the grouped absolute and relative returns. However, the initial share price movement cannot be used to be a predictor of the absolute and relative returns.

7.5.4.1.2.2.3. Multivariate cross-sectional analyses for IPO long run return based on market related characteristics

The market related characteristics are used to develop a regression model for IPO long run returns. The market to book value and the price to earnings ratio are the two market related characteristics used in this study. The regression model for IPO long run returns is shown in equation (7.5) below.

$$IPO\_Returns_{t\_delist} = \alpha + \beta_1 MBV_i + \beta_2 P/E_i + \varepsilon i \qquad (7.5)$$

Where P/E stands for the price to earnings ratio

Table 7.41: Multivariate cross-sectional analyses for IPO long run return based on market related characteristics

Independent Variable	Dependent Variable: Long run PO returns			
	Absolute returns	Relative returns	Grouped Absolute returns	Grouped Relative returns
Intercept	1.182*	0.836	1.884***	1.854***
MBV	-0.130**	-0.154**	-0.039	-0.080
P/E	-0.018	-0.050	0.044	-0.020
R^2	0.018	0.029	0.003	0.007
Adjusted R^2	0.019	0.022	-0.004	0.000
F-value	2.538*	4.085**	0.397	1.013
Durbin-Watson stat	1.711	1.899	1.757	1.662

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results on Table 7.41 show that the market to book value (MBV) significantly affects both the absolute and relative returns. This is consistent with the findings by Mulyono and Khairurizka (2009:49) which highlighted that the market to book value had a significant impact on the stock return. The P/E ratio on the other had indicates no significant relationship with all the four classes of long run returns. This finding contradicts with a study by Zamanian *et al.* (2013:69) which showed that P/E ratio is one of determinant of abnormal long-run returns of IPO in both private and public companies in Iran.

7.5.4.1.2.2.4. Multivariate cross-sectional analyses for IPO long run return based on financial ratios.

The regression model for IPO long run returns is shown in equation (7.6) below.

$$IPO\_Returns_{t\_delist} = \alpha + \beta_1 CR_i + \beta_2 QR_i + \beta_3 OP_i + \beta_4 NP_i + \beta_5 ROA_i +$$
$$\beta_6 ROE_i + \beta_7 MBV_i + \beta_8 TAT_i + \beta_8 D/E_i + \varepsilon i$$

(7.6)

Where D/E represents the debt to equity ratio

Table 7.42: Multivariate cross-sectional analyses for IPO long run return based on financial ratios.

Independent Variable	Dependent Variable: Long-term IPO returns			
	Absolute returns	**Relative returns**	**Grouped Absolute returns**	**Grouped Relative returns**
Intercept	0.686	-0.571	2.184***	1.642***
CR	-0.191*	-0.076	-0.130	-0.096
QR	0.011	-0.048	-0.098	-0.084
OP	-0.082	-0.051	0.037	0.007
NP	0.094	0.124	0.109	0.186**
ROA	-0.017	-0.006	-0.006	0.077
ROE	0.052	0.005	0.191***	0.083
TAT	0.006	0.019	-0.035	-0.014
D/E	0.098	0.084	0.102	0.098
R^2	0.073	0.038	0.111	0.060
Adjusted R^2	0.043	0.011	0.083	0.034
F-value	2.445**	1.398	3.872***	2.522**
Durbin-Watson stat	1.984	1.758	1.852	1.794

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

From Table 7.42 it is observed that the current ratio (CR) is the only variable that to a lesser extent can have a significant influence on the absolute returns. Also, the net profit margin (NP) is the only variable that has a significant positive influence on the grouped relative returns. The return on equity (ROE) also shows a significant positive influence on the grouped absolute returns. The results on the multivariate cross sectional analysis also established that the NP has a significant relationship with grouped relative return. Furthermore, other variables such as QR, MBV, D/E, ROA, OP and TAT were found to have no significant relationship with all the four classes of IPO long run returns.

7.5.5. Conclusion on regression analysis based on IPO long run returns

This section examined regression analysis of IPO long run returns based on IPO characteristics. In this study, two types of regression models were used: the univariate regression analysis and the multivariate regression analysis. The summary of the key findings are presented below;

Table 7.43: Summary of key findings from the regression analysis based on IPO long run returns

Univariate regression analysis	Multivariate regression analysis
• The market period (MP) is seen to be the single factor that has a high predictive power for all the classes of IPO long run returns.	• Market period is the only factor which significantly affects both the absolute and relative returns and the grouped actual absolute and relative returns.
• The absolute returns are significantly affected by market period, firm age, current ratio, quick ratio, net profit margin and the market to book value.	• Market period and firm age significantly affect the grouped absolute and relative returns.
• The relative returns are significantly affected by the market period, market to book value and the net profit margin.	• The relative returns are significantly affected by the market period and market to book value while the grouped relative returns are significantly affected by the firm age and market period.
• The grouped absolute and relative returns are significantly affected by the same factors.	• From these results, it is evident that only three main factors (**MP, Age, and MBV**) emerge as significant explanatory variables for IPO long run returns.
• The factors that can be used to explain both the grouped absolute and relative returns include: the age, GP, MP, QR,	• When comparing these results with the results from the univariate regression analysis, it is seen that while some factors (**QR, CR, and NP**) might individually affect the IPO long run returns, when

CR, NP and ROE.	combined with other factors their effect is less significant.	
• Also evident is that the ROA and TAT showed no significant relationship with any of the four classes of IPO long run returns	**Firm specific characteristics.** • Industry shows no significant influence of any of the four classes of long run returns • Company's age and the gross proceeds significantly influence the grouped absolute and relative returns.	**Issue related characteristics** • Market period is a significant predictor of all the four classes of IPO long run returns. • Initial share price movement significantly affects the grouped absolute and relative returns.
	Market related characteristics • Market to book value has a significant influence on the absolute and relative returns. • P/E ratio on the other had indicates no significant influence on all the four classes of long run returns	**Financial ratios.** • CR is the only variable that to a lesser extent can significantly influence absolute returns. • Also, the NP is the only variable that has a significant relationship with grouped relative returns. While ROE shows a significant influence on the grouped absolute

| | | returns |
| | | • QR, M/B, D/E, ROA, OP and TAT were found to have no relationship with all the four classes of IPO long run returns |

From Table 7.43, it is observed the market period (MP), firm age and market to book value (MBV) are the factors that have a significant relationship with absolute and relative returns. Also, operating profit margin (OP), quick ratio (QR), current ratio (CR) and the return on equity (ROE) were identified as factors which individually have an impact on either the actual absolute returns or actual relative returns. With regards to the grouped absolute and grouped relative returns, MP, GP and the age were identified as factors that have a significant relationship with grouped absolute and grouped relative returns. Moreover, CR, ROE, QR, ISM and NP were also identified as factors which individually have an impact on either the grouped absolute returns or grouped relative returns.

All of the factors with a significant relationship will be tested in a structural equation model (SEM) to determine which of these factors can be used as good predictors of IPO long run returns.

7.5.6. Structural Equation Modelling (SEM) for IPO long run returns

Structural Equation Modeling (SEM) is a technique which incorporates a whole range of standard multivariate analysis methods, taking into account regression analysis, factor analysis and analysis of variance (MacLean and Gray, 1998). Legare (2009:10) states that SEM combines factor analysis and multivariate regression models to estimate relationship between observable variables and unobservable (latent) variables. SEM has two components: the measurement model, which links the observed variables to latent variables; and the structural model which links the latent variables amongst each other. SEM approximates the unknown coefficients in a set of linear structural equations. SEM also assumes that there exists a causal structure amongst a set of latent variables. The observed variables are indicators of the latent variables. The latent variables may usually appear as either a linear

combinations of observed variables, or may be intervening variables in a causal chain. The results of SEM for the absolute and relative returns and group absolute and relative returns are presented on Figure 7.7 and Figure 7.8 and Table 7.45 and table 7.46 below;

Figure 7.7: Structural Equation Model Path diagram for IPO absolute and actual relative long run returns
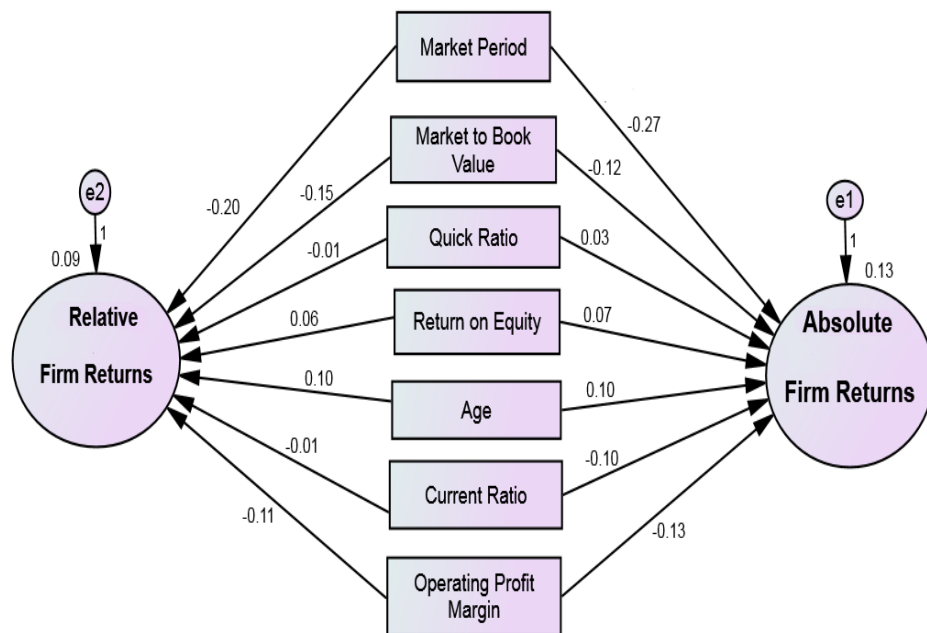
The SEM path diagram in Figure 7.7 indicates the different path coefficients explaining the relationship between the selected explanatory variables and the absolute and relative returns. The negative path coefficients indicate a negative relationship while the positive path coefficients indicate a positive relationship. It is seen that the market period, market to book value, quick ratio, current ratio and the operating profit margin have negative relationships with relative returns while the return on equity and the company's age have a positive relationship. For the absolute returns the factors that show a negative relationship are the market period, the market to book value, the current ratio and the operating profit margin. The significance of each of the relationships established in the path diagram is indicated in Table 7.44.

Table 7.44: Casual relationships for Structural Equation Model based on IPO absolute and relative long run Returns

Causal Relationship		Factor	Estimate	S.E.	C.R.	P	Label
Absolute Return	<---	Firm Age	.142	.074	1.910	.056	Significant
Absolute Return	<---	Market Period(MP)	-1.441	.285	-5.060	***	Significant
Absolute Return	<---	Current Ratio (CR)	-.295	.165	-1.786	.074	Significant
Absolute Return	<---	Market to book value (MBV)	-.448	.208	-2.151	.031	Significant
Absolute Return	<---	Quick Ratio (QR)	.081	.146	.556	.578	N.S
Absolute Return	<---	Return On Equity (ROE)	.422	.314	1.345	.179	N.S
Absolute Return	<---	Operating Profit Margin (OP)	-.606	.272	-2.231	.026	Significant
Relative Return	<---	Market Period(MP)	-1.001	.279	-3.593	***	Significant
Relative Return	<---	Operating Profit Margin (OP)	-.480	.266	-1.806	.071	Significant
Relative Return	<---	Firm Age	.133	.073	1.822	.068	Significant
Relative Return	<---	Current Ratio (CR)	-.034	.162	-.208	.835	N.S
Relative Return	<---	Quick Ratio (QR)	-.029	.143	-.206	.837	N.S
Relative Return	<---	Return On Equity (ROE)	.337	.307	1.097	.273	N.S
Relative Return	<---	Market to book value (MBV)	-.535	.203	-2.630	.009	N.S

N.S means non-significant relationships

Figure 7.7 and Table 7.44 show the results of the causal relationships between the independent variables and the absolute and relative long run IPO returns. The SEM analysis indicates that the MP, age, MBV and the OP can significantly predict both the absolute and relative long run IPO returns. The results also indicate that the CR can only significantly predict the absolute returns. The ROE and the QR do not show any significant causal relationship with the IPO long run returns.

Figure 7.8: Structural Equation Model Path diagram for grouped absolute and grouped relative returns
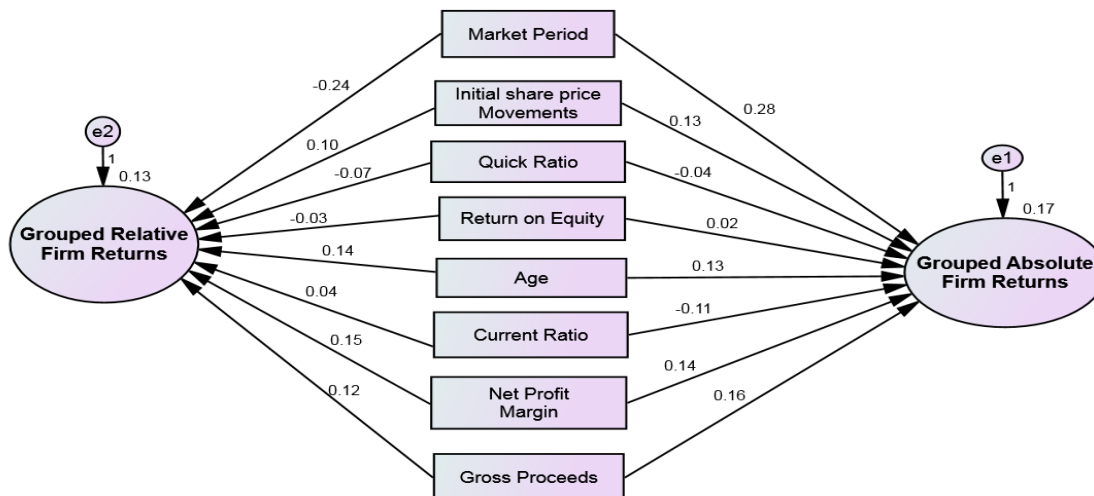
The SEM path diagram in Figure 7.8 indicates the different path coefficients explaining the relationship between the selected explanatory variables and the groped absolute and grouped relative returns. It is seen that the market period, quick ratio, and the return on equity, have negative relationships with grouped relative returns while the initial share price movements, company's age, current ratio, net profit margin, and gross proceeds have a positive relationship with grouped relative returns. For the grouped absolute returns the current ratio and the quick ratio show a negative relationship. The significance of each of the relationships established in the path diagram is indicated in Table 7.45 below.

Table 7.45: Structural Equation Model for IPO long run returns

Causal Relationship		Factor	Estimate	S.E.	C.R.	P	Label
Absolute	<---	Market Period(MP)	-.785	.144	-5.458	***	Significant
Absolute	<---	Firm Age	.093	.038	2.483	.013	Significant
Absolute	<---	Gross Proceeds (GP)	.205	.068	3.009	.003	Significant
Absolute	<---	Net Profit Margin (NP)	.417	.171	2.435	.015	Significant
Absolute	<---	Initial Share Price Movements (ISM)	.201	.082	2.456	.014	Significant
Absolute	<---	Current Ratio (CR)	-.176	.083	-2.113	.035	Significant
Absolute	<---	Return On Equity (ROE)	.057	.158	.358	.720	N.S
Absolute	<---	Quick Ratio (QR)	-.058	.074	-.790	.430	N.S
Relative	<---	Gross Proceeds (GP)	.127	.058	2.196	.028	Significant
Relative	<---	Market Period(MP)	-.540	.122	-4.424	***	Significant
Relative	<---	Firm Age	.086	.032	2.688	.007	Significant
Relative	<---	Current Ratio (CR)	-.052	.071	-.737	.461	N.S
Relative	<---	Net Profit Margin (NP)	.390	.145	2.681	.007	Significant
Relative	<---	Initial Share Price Movements (ISM)	.126	.069	1.821	.069	Significant
Relative	<---	Return On Equity (ROE)	-.084	.134	-.625	.532	N.S
Relative	<---	Quick Ratio (QR)	-.079	.063	-1.259	.208	N.S

N.S means non-significant relationships

Figure 7.8 and Table 7.45 show the results of the causal relationships between the independent variables and the grouped absolute and relative long run IPO returns. The SEM analysis indicates that the MP, age, GP, NP and ISM can significantly predict both the grouped absolute and relative long run IPO returns. The results also indicate that the CR can only significantly predict the grouped absolute returns. The QR and ROE show no significant causal relationship with the grouped IPO long run returns.

7.5.7. Conclusion on SEM for IPO long run returns

The summary of the key findings on of the SEM based on actual absolute and actual relative returns and grouped absolute and relative returns are presented below

Table 7.46: The summary of the key findings on the SEM based on actual absolute and actual relative returns and grouped absolute and relative returns

Absolute returns	Relative returns	Grouped absolute returns	Grouped relative returns
Market period (negative relationship)	Market period (negative relationship)	Market period (negative relationship)	Market period (negative relationship)
Age (positive relationship)	Age (positive relationship)	Age (positive relationship)	Age (positive relationship)
Market to book value (negative relationship)	Market to book value (negative relationship)	Gross proceeds (positive relationship)	Gross proceeds (positive relationship)
Operating profit margin (negative relationship)	Operating profit margin (negative relationship)	Initial share price movement (positive relationship)	Initial share price movement (positive relationship)
Current ratio (negative relationship)		Net profit margin (positive relationship)	Net profit margin (positive relationship)
		Current ratio (negative relationship)	

The results on Table 7.46 show the key findings on the SEM based on actual absolute and actual relative returns and grouped absolute and relative returns. These are factors which have been identified to have a significant relationship with IPO long run returns and thus can be used as predictive factors for long run returns.

7.6. PART D- IPO SUCCESS AND FAILURE PATTERNS

This section is divided into three parts. The first part of this section will establish successful companies from failed ones on the JSE. In the second part of this section a descriptive statistics of IPO success and failure patterns based on IPO characteristics will be provided.

Lastly, the third part of this section will present a cross sectional analysis where statistical analyses such as correlation analysis, regression analysis and structural equation model will be used to clearly identify the relationships between IPO success and failure patterns and IPO characteristics.

7.6.1. Establishing failed, acquired, survival and successful companies for a period of 1996-2007.

The entire sample for this study consisted of 313 companies and from this sample we found that 220 companies survived at least for five years, while 93 companies got delisted within the first five years after listing. Based on the criteria established in the methodology on IPO failure, 65 IPO companies had a negative raw return, and delisted with a share price of one cent or below one cent or had a sleepy falling price pattern prior to their delisting periods. The remaining 25 companies had a positive raw return and did not close with a share price of one cent or below one cent. Also, three companies had incomplete information and as such were excluded from the analysis. This resulted in the number of delisted companies reduced from 93 to 90. From these findings the 65 companies were treated as failed companies and the 25 companies as acquired companies (mergers and acquisitions). Evidence from the SENS and other secondary material on the JSE also indicated that these selected 25 companies were actually acquired.

With regards to IPO success, 220 companies were identified as surviving companies and after applying the methodology this study adopted for determining IPO success, it was established that 32 had both a wealth relative index greater than one and a positive five year average ROE for the first five years, and thus were considered successful companies. 185 companies had a wealth index relative less than one and a negative ROE and thus were considered as survival companies. Three companies had a wealth relative index greater than one and a negative five year average ROE. Given that these three companies are so small to adopt another criterion, they were then considered as survival companies. Table 7.47 shows the descriptive statistics of failed, acquired, survival and successful companies for a period of 1996-2007.

Table 7.47: Descriptive statistics of failed, acquired, survival and successful companies within the period from 1996-2007.

Post IPO categories	Number of IPOs	Percentage of total
Failed	65	20.97%
Acquired	25	8.06%
Survival	188	60.65%
Success	32	10.32%
Total	310	100%

From Table 7.47, it is observed that there are more survival and failed IPO companies with a percentage of 60.65% and 20.97% respectively than acquired (8.06%) and successful (10.32%) companies on the JSE. Carpentier and Suret (2007:16), in their study on Canadian penny stocks, found that non-surviving issuers (non-survivors include acquired and merged companies) represent 48.52% of the sample, 37.67% represented survivor's issuers (companies that continued to remain listed) of the sample and 13.81% represented success issuers of the sample. This study also established that in the long run approximately five out of ten new issuers in Canada failed, one was successful, and four stayed alive but did not progress. Moreover, the survival rate of new issuers in Canada after five or ten years was higher than that observed in the USA. In addition, Kooli and Meknassi (2007:39) studied the survival profiles of US IPO issuers from 1985-2005 and established that the failure rates of IPOs increased from four percent to six percent each year and reached 20.23% five years after the IPO. Acquired companies followed a similar trend and reached 24.59% after five years. Also the survival rate declined each year as more companies were either acquired or delisted and by their fifth year, only 55.18% of the companies were still operating independently. Based on these findings, it is clear that the percentage of acquired companies (mergers and acquisitions) on the JSE (8.06%) is relatively smaller compared to that of Canada (48.52%) and the US (24.59%). Also, the failure and success rates on the JSE are similar to those established in Canada and the US. However, a higher percentage of companies (60.65%) on the JSE survived after a five year period compared to both Canada and the U.S.

7.6.2. Descriptive statistics of success and failure patterns based on IPO Characteristics

In this section the descriptive statistics of success and failure patterns based on IPO characteristics will be provided.

7.6.2.1. Success and failure patterns based on initial share price movements

In predictability of IPO success, survival or failure rates, the initial prices movements have been used. In this study we calculated the 5 days moving average for each IPO over a one month period (specifically its first trading month). The results on the success and failed patterns based on initial share price movements are presented below.

Figure 7.9: Descriptive statistics of success and failed patterns based on initial share price movements

	Failure	Acquired	Survival	Success
■ Downtrend	64.62%	52.00%	64.36%	50.00%
■ Uptrend	21.54%	36.00%	23.94%	31.25%
■ Unstable trend	13.85%	12.00%	11.70%	18.75%
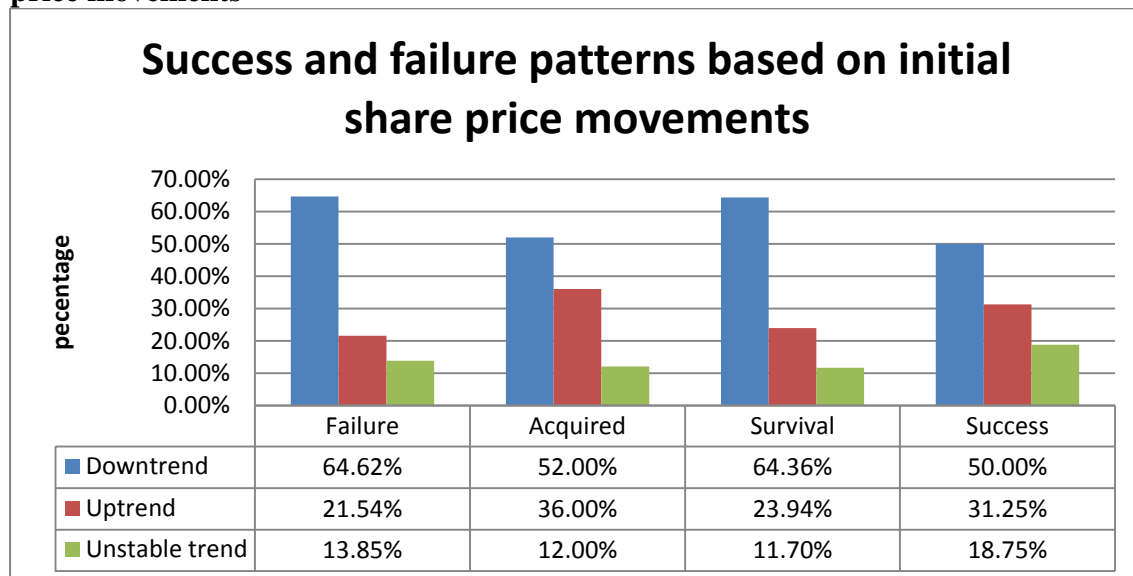
The results in Figure 7.9 show the success and failure patterns based on the initial share price movements (downtrend, uptrend and unstable trend). Unstable trends are IPO companies that have a reoccurring up and down trend. From the Figure 7.9, it is seen that the downward trend is dominant amongst failed and surviving IPOs since a higher percentage of failure (64.62%) and survival (64.36%) companies show an initial downward trend compared to acquired and successful companies. Also, a higher percentage of acquired (36.00%) and successful (31.25%) IPOs show an upward trend in the initial share price movements compared to failure and survival IPOs. These results are consistent with findings by Kiweu (1991) on the Nairobi Stock Exchange. Using price data collected from Nairobi Stock Exchange in order to determine the behaviour of share prices, he established empirically that there were no reported patterns in share price movement.

7.6.2.2. Success and failure patterns based on market periods (Hot and cold markets)

Studies (Kooli & Meknassi 2007:42; Carpentier & Suret, 2007:11; Ahmad, 2012:7) have established that there exists a negative relationship between IPO market periods and the success and survival of IPOs in the aftermarket.

Figure 7.10: Descriptive statistics of success and failed patterns based on market periods
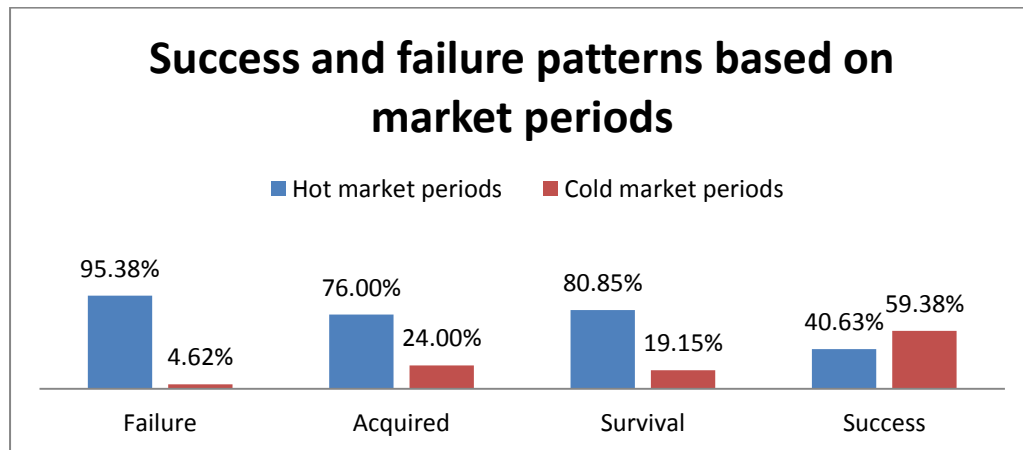
From Figure 7.10 it is established that hot market periods are characterized by high failure rates (95.38%), high survival rates (80.85%) and high acquisition rates (76.00%). While the cold market period is dominated by successful IPOs (59.38%). These results suggest that there are significant differences in the hot and cold market period based on IPO success and failure patterns on the JSE. Similar trends of high failure rates during hot market periods were also observed in several studies by (Carpentier & Suret, 2007: 17; Boubakri *et al.,* 2005:6; Demer & Joos, 2006:17). Researchers like Ahmad (2012:7) and Loughran and Ritter (2004) maintain that hot market periods are usually characterized by an excess demand for new issues which attract lower quality issuers. As such one will expect companies that go public during such periods of high demand to be of a lower quality and thus more likely to fail. This is in line with the 'windows of opportunity" or overvaluation hypothesis (Ritter, 1991; Loughran & Ritter, 1995; Boubakri *et al.,* 2005:8) which states that during hot periods, there are more issuers seeking to benefit from the window of opportunity so as to maximize their gross proceeds. These issuers recognize periods in which the equity market levels are relatively high, to enable them raise capital at lower costs, which results in IPO volume peaks. This gives room for low-quality companies with the incentive to go public regardless of the risk of not being able to withstand periods of economic downturn and thus increase their probability of failure. With this trend in mind investors can maximize their returns by

buying IPOs listed in the cold market periods because of the high likelihood of success in the long run.

7.6.2.3. Success and failure patterns based on industry

Prior research has found the IPO failure; success and survival rates of IPO companies can be explained by the differences in their post-IPO performance across industries (Ritter, 1991; Polat & Hill, 2007:17; Hamza & Kooli, 2010; Carpentier & Suret, 2011; Ahmad 2012:7; Demers & Joos, 2006:17).

Figure 7.11: Descriptive statistics of success and failed patterns based on industry

Success and failure patterns based on industry

	Failure	Acquired	Survival	Success
■ Mining	4.62%	8.00%	13.30%	18.75%
■ Financials	18.46%	4.00%	15.96%	18.75%
■ Technology	36.92%	24.00%	16.49%	6.25%
■ Others	40.00%	64.00%	54.26%	52.26%

From Figure 7.11 it is observed that IPOs in the other sector display the highest acquisition, survival, success and failure rates. Also, IPOs in the mining sector show high success rate (18.75%) and low failure rate (4.62%). Moreover, also evident is the fact that IPOs in the technology sector show high failure rates and low success rates. Similar trends of high failure rates and low success rates in the technology sectors were also observed by (Hensler, Springer & Rutherford, 1997; Demers & Joos, 2006: 17; Kooli & Meknassi 2007:4; Ahmad 2012:7:17). With respect to the mining sectors, Kooli and Meknassi (2007:4) in their study observed that the energy and mining sector had the smallest failure rate (10.43%), which is consistent with the findings of this study. They also established that a high survival rate (42.16%) was seen in the financial sectors, which is contrary to the findings this study.

7.6.2.4. Success and failure patterns based gross proceeds (Size of the IPO)

The relationship between size of the IPO and the failure risk, survival, and success has been documented by prior studies (Hensler *et al.,* 1997; Jain & Kini, 2000; and Chou, Cheng & Chien, 2006; Ritter, 1991; Loughran & Ritter, 1995; Carpentier & Suret, 2007:2).

Figure 7.12: Descriptive statistics of success and failed patterns based on gross proceeds

Success and failure patterns based on Gross proceeds

	Failure	Acquired	Survival	Success
< 200M	64.62%	36.00%	44.15%	25.00%
200M-500M	23.08%	32.00%	22.34%	31.25%
> 500M	12.31%	32.00%	33.51%	43.75%
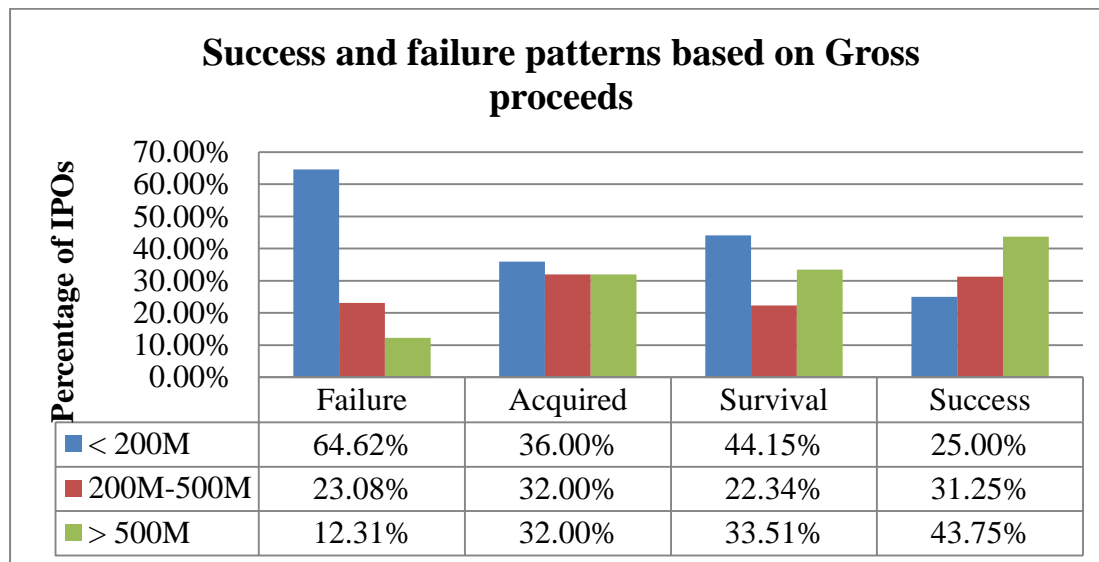
The results in Figure 7.12 depict that IPOs that have gross proceeds of less than R200 million, have a high failure rate (64.62%), high survival rate (44.15%) and a low success rate (25.00%). Also, IPOs that have gross proceeds of more than R500 million, have a high success rate (43.75%) and low failure rate (12.31%). These results indicate that while the probability of failure increases for IPOs that have a smaller issue size; the probability of success increases for IPOs that have a larger size. Chou *et al.* (2006:14) observed in their study that failed companies on average have a smaller issuing size, which is consistent with the findings of this study. Kooli and Meknassi (2007:39) found that small-sized IPOs had a high failure rate of 58.23% and that the size of the IPO was negatively correlated to the failure rate. Other studies by Carpentier and Suret (2007:2) and Demers and Joos (2006:15) also established that the size of IPO was positively related to the survival rates of new issues.

7.6.2.5. Success and failure patterns based company's Age

A company's age is an important determinant of the decision to go public (Sejjaaka, 2011: 284) and has an impact on the success, survival and failure rate (Hensler *et al.,* 1997; Ritter, 1991; Van der Goot , Van Giersbergen & Botman, 2009:59).

Figure 7.13: Descriptive statistics of success and failed patterns based Age

Figure: Success and failure patterns based on firms Age

	<1years	1-2years	3-5years	6-10years	11years
Failure	30.77%	36.92%	12.31%	12.31%	7.69%
Acquired	16.00%	36.00%	12.00%	12.00%	24.00%
Survival	20.74%	21.28%	11.70%	12.23%	34.04%
Success	6.25%	12.50%	9.38%	18.75%	53.13%
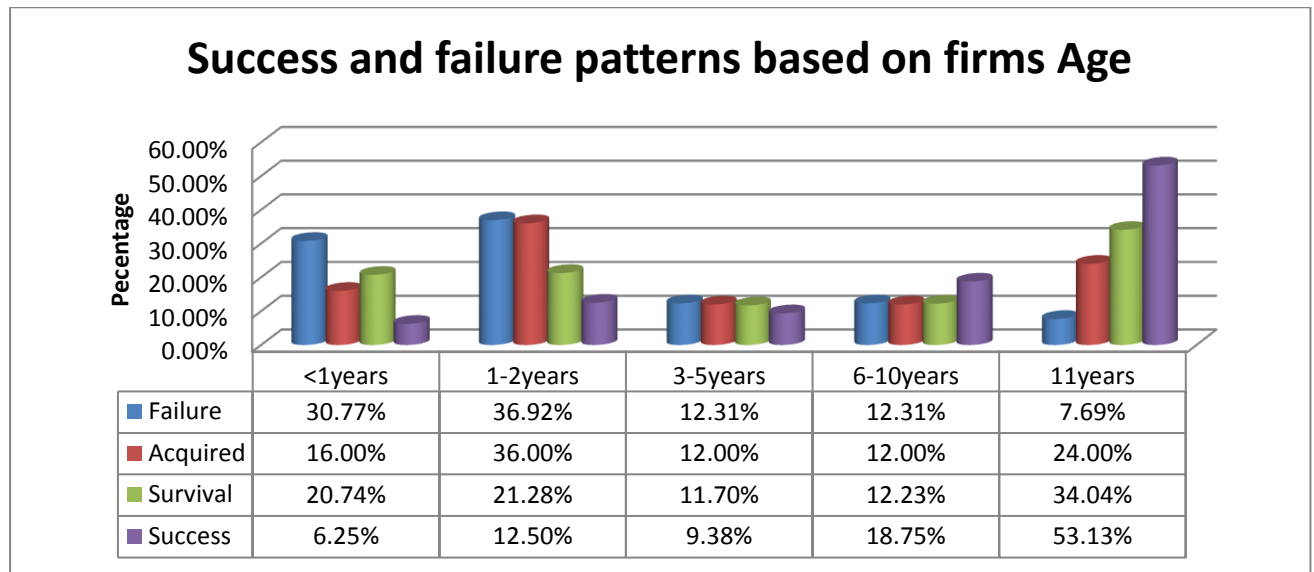
The results on Figure 7.13 illustrate that a majority of failed IPOs are found between the age groups of one to two years and less than one year old (36.92% and 30.77% respectively). Also, successful IPOs are older than ten years. Also, it is observed that the majority of successful companies are older than 10 years prior to their listings. The findings indicate that while the probability of failure is higher amongst younger companies; the probability of success increases with the company's age. With respect to acquired and survival companies, it is observed that the bulk of the companies are found in the age groups between one to two years and older than ten years. Studies by (Carpentier & Suret 2011; Demers & Joos 2007; and Hensler et al., 1997) observed that younger companies experience a higher post issue failure rate and thus suggesting a negative relationship between company's age at IPO and the failure probability, which is consistent with the findings of this study. Peristiani and Hong (2004:5) found a company's age to be a fairly good predictor of aftermarket survival. Hensler, Rutherford and Springer (1997) pointed out that a company's age at the time of listing is positively related to survival.

7.6.3. Conclusion on descriptive statistics of IPO success and failure patterns based on IPO characteristics

This section began by establishing failed, acquired, survival and successful companies for the period from 1996-2007. From the results, it was observed that there are more survival and failed IPO companies on the JSE than acquired and success companies. This trend was also found to be similar in other stock markets such as the US and Canada. The descriptive statistics of the IPO success and failure patterns based on the IPO characteristics were examined. Firstly with regards to the issue related characteristics (initial share price movement and IPO market periods), the results on the initial share price movement established that the downward trend is dominant amongst failed and surviving IPOs since a higher percentage of failure (64.62%) and survival (64.36%) companies show an initial downward trend compared to acquired and successful companies. Also, a higher percentage of acquired (36.00%) and successful (31.25%) IPOs show an upward trend in the initial share price movement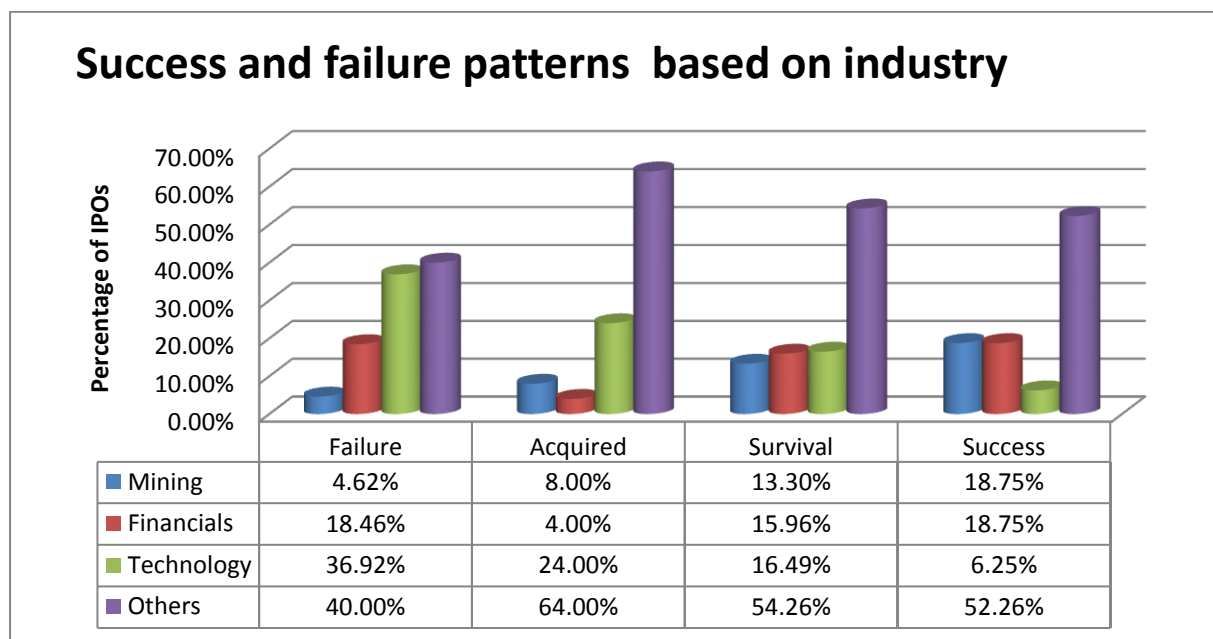s compared to failure and survival IPOs. With regards to the market period, it was established that hot market periods are characterized by high failure rates (95.38%), high survival rates (80.85%) and high acquisition rates (76.00%). While the cold market period is dominated by successful IPOs (59.38%). These results suggest that there are significant differences in the hot and cold market period based on IPO success and failure patterns on the JSE. Similar trends of high failure rates and low survival rates during hot market periods were also observed in several studies (Carpentier & Suret, 2007: 17; Boubakri, Kooli & L'Her, 2005:6; Demer & Joos, 2006:17).

Secondly, with respect to the firm characteristics (gross proceeds, company's age and industry), the results on the company's age illustrated that that failed IPOs are found between the age groups of one to two years and less than one year old. Also, successful IPOs are older than ten years. The findings indicate that while the probability of failure is higher amongst younger companies; the probability of success increases with the company's age. These findings were consistent with other studies (Carpentier & Suret 2011; Demers & Joos 2007; and Hensler *et al.,* 1997). With regards to gross proceeds, it was observed that IPOs with gross proceeds less than R200 million, have a high failure rate, high survival rate and a low success rate. Also, IPOs that have a gross proceeds of more than R500 million, have a high success rate (43.75%) and low failure rate (12.31%). These results indicate that while the probability of failure increases for IPOs that are of smaller size; the probability of success

increases for IPOs that have a larger size. These results were in line with other studies by (Chou *et al,* 2006:14; Kooli & Meknassi, 2007:39). The results from the industry observed that IPOs in the mining sector showed high success rate (18.75%) and low failure rate (4.62%). Also evident is the fact that IPOs in the technology sector show high failure rates and low success rates. Similar trends of high failure rates and low success rates in the technology sectors were also observed by other studies (Hensler, Springer & Rutherford, 1997; Demers & Joos, 2006: 17; Kooli & Meknassi 2007:4; Ahmad 2012:7:17). Based on the findings established in the descriptive statistics, further analysis will be performed to find out if there are any significant relationships between these IPO characteristics and the success and failure patterns. Cross sectional analysis will be performed where statistical analysis such as correlation analysis, regression analysis and structural equation models will be used to clearly identify relationships.

7.6.4. Pre financial ratios and market related characteristics

As already established in subsection 7.5.3 above that a PCA was used so as to reduce the number of variables and extract the most relevant components. Based on the financial ratios and market related characteristics identified (Table 7.35 above), it was observed that the ratios with the highest correlation (greater than 0.81) are the current ratio (0.923) and quick ratio (0.915) for component 1; net profit margin (0.951) and ROE (0.942) for component 2; M/B (0.863) for component 3; total asset turn over (0.938) for component 4 and operating profit margin (-0.824) and ROA (-0.859) for component 5, can be used to explain most of the variance of the tested financial ratios. These chosen market related characteristics and financial ratios (current ratio, quick ratio, net profit margin, ROE, ROA, market to book value, total asset turn over and operating profit margin) will be used in regression analysis along with the other IPO characteristics to test if there are any significant relationships between them and IPO success and failure patterns.

7.6.5. Cross sectional analysis linking IPO characteristics to success and failure patterns

In establishing whether there are any significant relationships between IPO characteristics and the success and failure patterns, various analyses such as correlation analysis; regression analysis and structure equation models will be performed.

7.6.5.1. Correlation analysis

A Pearson correlation measures the strength of the linear relationship between two continuous variables. The correlation coefficient (r) ranges from -1.0 to +1.0. When r is closer to -1 or +1, it means the two variables are closely related (Coakes, 2005:18). On the other hand, when r is close to 0, it means the two variables are not related (no relationship between the two variables). The P-value measures the level of significance (which is usually valid at the 5% level). In the correlation analysis we tested if the independent variables were correlated among themselves in order to check if there are any multicollinearity problems that may distort the regression analysis.

Table 7.48: Pearson correlations based on firm characteristics, issue related characteristics and success and failure patterns

	Failure and Success Patterns	Market period	Industry	Age	Gross Proceeds	Initial share price movement
Failure and Success Patterns	1					
Market period	-0.278**	1				
Industry	-0.035	0.018	1			
Age	0.297**	-0.023	0.009	1		
Gross Proceeds	0.225**	-0.141*	-0.197**	0.230**	1	
Initial share price movement	0.028	0.007	0.111	0.077	-.037	1

** Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

From Table 7.48, we did not find high degrees of correlation between any sets of variables, and are confident that multicollinearity is not a problem. Also, it is observed that the market periods (hot and cold markets), the company's age and gross proceeds are the IPO characteristics that have a significant relationship with IPO success and failure patterns and these results are statistically significant at the 1% and 5% level. The market period shows a negative relationship while the age and gross proceeds show a positive relationship with IPO success and failure patterns. The industry and initial share price movement have been

identified as the IPO characteristics that do not have any significant relationships with IPO success and failure patterns.

From the above, given that the industry and initial share price movement have been identified as the IPO characteristics that do not have any significant relationships with success and failure patterns, they will be completely left out when performing the regression models using the selected variables.

7.6.5.2. Regression analysis for IPO success and failure patterns

The selection of explanatory factors for the regression analysis was based on a series of primary analysis. The firm characteristics and the issue related characteristics were selected after performing a set of a correlation analysis (in table Table 7.48 above). In this section a univariate regression analysis and the multivariate regression analysis were performed to establish which IPO characteristics have a significant relationship with IPO success and failure.

7.6.5.2.1. Univariate regression analysis for IPO success and failure patterns

The univariate regression analysis for IPO success and failure patterns is given as

$$IPO\_Success/Failure_i = \alpha + \beta\,(X_i) + \varepsilon i$$

(7.7)

Where

$IPO\_Success/Failure_{t\_delist}$ represents the success and failure pattern of the company

X_i Represents each of the independent variables in table 7.36 (Abbreviations used in the regression equation)

The result of the univariate regression analysis for IPO success and failure patterns is presented below.

Table 7.49: Univariate regression analysis for IPO success and failure patterns

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	T-Statistics
Age	0.297	5.462***
GP	0.225	4.053***
MP	-0.278	-5.077***
CR	-0.089	-1.518
QR	-0.107	-1.844*
OP	0.040	0.634
NP	0.181	2.946***
ROA	-0.063	-1.071
ROE	0.109	1.923*
MBV	0.104	1.771*
TAT	0.019	0.327

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.49 indicate that the factors which can significantly explain variations in IPO success and failure patterns are the company's age, gross proceeds (GP), market period (MP), net profit margin (NP), quick ratio (QR), return on equity (ROE) and the market to book value (MBV). The company's age, GP, and NP show a strong positive relationship with IPO success and failure patterns. This indicates that as the company's age, GP or NP increases, the IPO's probability of survival and success increases. These results are consistent with the findings from other studies (Carpentier & Suret, 2007:2; Demers & Joos, 2006:15) which established that the size of IPO (GP) was positively related to the survival rates of new issues. Also, Hensler, Rutherford and Springer (1997) established that a company's age at the time of listing is positively related to its long run survival. The market period indicates a strong negative relationship with IPO success and failure patterns which is consistent with other studies (Carpentier & Suret, 2007:17; Boubakri, Kooli & L'Her, 2005:6; Demer & Joos, 2006:17). These studies highlighted that hot market IPOs were characterized by high failure rates and low survival and success rates when compared to cold market IPOs.

Furthermore, the results indicate that the CR, OP, ROA and TAT cannot be used to explain the variations in IPO success and failure patterns. These findings are contrary to that of Demer and Joos (2005:22) who found that the TAT had a significant positive relationship with the likelihood of failure for companies in the non-tech, combined high tech and Internet, and high tech sectors. Peristiani and Hong (2004:5) used a company's ROA to gauge its

financial strength and observed a strong and statistically significant negative relationship between the probability of delisting and a company's pre-issue ROA.

7.6.5.2.2. Multivariate Regression Analysis

In this section, various multiple regression models will be implemented to get an overall view of factors that can be used to predict IPO success and failure patterns. The selection of explanatory factors for the multiple regression analysis was based on a series of primary analysis. The firm characteristics and the issue related characteristics were selected after performing a set of correlation analysis (table 7.48 above). The financial ratios and market related factors were selected from the component factor analysis performed in section 7.53 (Table 7.35 above). A total of eleven factors were found suitable for the model as these factors were expected to affect IPO success and failure. The first model will cover a comprehensive list of selected explanatory variables and the subsequent models will focus on each group of specific characteristics (firm characteristics, issue related characteristics, market related characteristics, and financial ratios).

7.6.5.2.2.1. Multivariate cross-sectional analysis for IPO success and failure patterns based on selected factors

The equation for the multivariate cross-sectional analysis for IPO success and failure patterns based on selected factors is given as

$$IPO\_Success/Failure_i = \alpha + \beta_1 Age_i + \beta_2 GP_i + \beta_3 MP_i + \beta_4 CR_i + \beta_5 QR_i + \beta_6 OP_i + \beta_7 NP_i + \beta_8 ROA_i + \beta_9 ROE_i + \beta_{10} MBV_i + \beta_{11} TAT_i + \varepsilon i$$

(7.8)

Table 7. 50: Multivariate cross-sectional analysis based on selected IPO characteristics

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	T-Statistics
Intercept	2.426	6.684***
Age	0.263	4.358***
GP	0.093	1.506
MP	-0.219	-3.589***
CR	0.072	0.729
QR	-0.170	-1.677*
OP	0.048	0.659
NP	0.106	1.026
ROA	-0.036	-0.512
ROE	0.024	0.236
MBV	0.084	1.429
TAT	-0.096	-1.512
R^2	0.214	
Adjusted R^2	0.178	
F-value	5.982***	
Durbin-Watson stat	2.133	

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.50 show that the factors which significantly affect the IPO success and failure patterns are the company's age, market period (MP) and the quick ratio (QR). The company's age and the market period are both significant at the 1% level while the quick ratio is significant at the 10% level. The company's age shows a positive relationship with IPO success and failure patterns while the market period and quick ratio shows a negative relationship. However, the gross proceeds and the net profit, which showed a highly significant influence on IPO success and failure patterns from the univariate analysis, did not show any significant statistical influence based on the multivariate analysis. Nevertheless, the company's age and market period are two key factors which can be used to explain the variation in IPO success and failure patterns, irrespective of whether they are used individually or in combination with other IPO characteristics.

After looking at the multivariate cross-sectional analysis for IPO success and failure patterns, which identified the MP, age, and QR as significant explanatory variables for IPO success and failure patterns, it becomes necessary to perform a multivariate cross-sectional analysis based on each individual grouping of IPO characteristics.

7.6.5.2.2.2. Multivariate cross-sectional analysis based on specific grouping of IPO characteristics.

The specific groupings of IPO characteristics are firm characteristics; issue related characteristics; market related characteristics and pre financial ratios.

7.6.5.2.2.2.1. Multivariate cross-sectional analysis for IPO success and failure based firm specific characteristics

Three firm specific characteristics are used to develop a regression model for IPO long run returns. The market characteristics used are firm age, gross proceeds and industry sector. The regression model for IPO success and failure patters is shown in equation (7.9) below.

$$IPO\_Success/Failure_i = \alpha + \beta_1 Age_i + \beta_2 GP_i + \beta_3 IND_i + \varepsilon i \tag{7.9}$$

Table 7.51: Multivariate cross-sectional analysis for IPO success and failure based firm specific characteristics

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	**T-Statistics**
Intercept	1.964	11.196***
Age	0.259	4.684***
GP	0.161	2.906***
Industry	-0.005	-0.093
R^2	0.114	
Adjusted R^2	0.106	
F-value	13.154***	
Durbin-Watson stat	1.857	

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.51 show that the company's age and gross proceeds significantly influence the success and failure patterns of IPOs on the JSE. The positive coefficients (betas) for both the age and GP indicate that as the company's age or GP increases, the probability of survival and success also increases. These findings are in line with other studies (Carpentier & Suret, 2007:2; Demers & Joos, 2006:15) which also established a positive relationship between the company's age, gross proceeds and IPO success. However, the industry was found to have no significant relationship with IPO success and failure patterns. This finding corresponds to the results established in the correlation analysis.

7.6.5.2.2.2.2. Multivariate cross-sectional analysis for IPO success and failure patterns based on issue related characteristics

The issue related characteristics used are the initial share price movements and the market period. The regression model for IPO success and failure patters is shown in equation (7.10) below:

$$IPO\_Success/Failure_i = \alpha + \beta_1 ISM_i + \beta_2 MP_i + \varepsilon i \qquad (7.10)$$

Table 7.52: Multivariate cross-sectional analysis for IPO success and failure patterns based on issue related characteristics

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	T-Statistics
Intercept	3.051	19.657***
ISM	0.030	0.540
MP	-0.278	-5.068***
R^2	0.078	
Adjusted R^2	0.072	
F-value	12.971***	
Durbin-Watson stat	1.745	

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

From Table 7.52 it is observed that the market period is the only factor that has a significant relationship with the IPO success and failure patterns. The initial share price movement clearly has no significant influence on the success and failure patterns of IPOs. This finding is in line with a study by Kiweu (1991) who examined share price movements on the Nairobi Stock Exchange. Using price data collected from Nairobi Stock Exchange in order to determine the behaviour of share prices, he established empirically that there were no reported patterns in share price movements. As such, it is important for investors to avoid predicting IPO success based on initial upward or downward swings in the share price movement.

7.6.5.2.2.2.3. Multivariate cross-sectional analysis for IPO success and failure patterns based on market related characteristics.

The market related characteristics are used to develop a regression model for IPO long run returns. The market to book value and the price to earnings ratio are the two market related characteristics used in this study. The regression model for IPO success and failure patterns is shown in equation (7.11) below.

$$IPO\_Success/Failure_i = \alpha + \beta_1 MBV_i + \beta_2 P/E_i + \varepsilon i \qquad (10)$$

Table 7.53: Multivariate cross-sectional analysis for IPO success and failure patterns based on market related characteristics.

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	**T-Statistics**
Intercept	2.515	10.803***
MBV	0.093	1.530
P/E Ratio	-0.046	-0.757
R^2	0.009	
Adjusted R^2	0.002	
F-value	1.305	
Durbin-Watson stat	1.613	

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.53 show that the MBV and P/E ratio have no significantly impact on the success and failure patterns of IPOs. However, when looking at the results from univariate regression analysis, it is observed that MBV can be used to explain the variations in IPO success and failure patterns, but the result is only significant at the 10% level.

7.6.5.2.2.2.4. Multivariate cross-sectional analysis for IPO success and failure patterns based on financial ratios

The component factor analysis in subsection 7.53 (on table 7.24) identified factors; CR, QR, NP, ROE, M/B, ROA, OP and TAT as the variables that explain most of the variance of the tested financial ratios. The regression model for IPO success and failure is shown in equation 10 below.

$$IPO\_Success/Failure_i = \alpha + \beta_1 CR_i + \beta_2 QR_i + \beta_3 OP_i + \beta_4 NP_i + \beta_5 ROA_i + \beta_6 ROE_i + \beta_7 MBV_i + \beta_8 TAT_i + \varepsilon i \qquad (10)$$

Table 7. 54: Multivariate cross-sectional analysis for IPO success and failure patterns based on financial ratios.

Independent Variable	Dependent Variable: Success and Failure Patterns	
	Success and Failure	
	Beta	**T-Statistics**
Intercept	2.862	9.670
CR	0.021	.200
QR	-0.173	-1.957**
OP	0.057	0.732
NP	0.060	0.535
ROA	-0.052	-0.691
ROE	0.139	1.751*
TAT	-0.099	-1.483
D/E	0.097	1.401
R^2	0.066	
Adjusted R^2	0.040	
F-value	2.540**	
Durbin-Watson stat	2.014	

*** Significant at the 1% level; ** significant at the 5% level, * significant at the 10%

The results from Table 7.54 indicate that quick ratio (QR) has a significant negative relationship with IPO success and failure patterns while the return on equity (ROE) has a significant positive influence of IPO success and failure patterns. When looking at the results from univariate regression analysis, it is observed that NP can be used to explain the variations in IPO success and failure patterns. However, the result from the multivariate reveals that the NP does not have any significant statistical influence on IPO success and failure patterns when combined with other factors. Moreover, other financial factors like the TAT, ROA and CR also show no significant statistical influence on IPO success or failure both in a univariate and multivariate analysis. As such, it can be concluded that these factors do not have any significant relationship with the success and failure patterns of IPOs.

7.6.5.3. Conclusion based on regression analysis based on IPO success and failure patterns

This section examined regression analysis of IPO success and failure patterns based on IPO characteristics. In this study, two types of regression models were used: the univariate regression analysis and the multivariate regression analysis. The summary of the key findings are presented below.

Table 7.55: Summary of the key findings on the regression analysis for IPO success and failure patterns

Univariate regression analysis	Multivariate regression analysis	
• The company's age, GP, MP, NP, QR, ROE and MBV are the factors that can significantly explain variations in IPO success and failure patterns.	• The company's age, market period and quick ratio are the factors which significantly affect the IPO success and failure patterns	
• Also established is the fact that the CR, OP, ROA and TAT cannot be used to explain the variations in IPO success and failure patterns	• The gross proceeds and the net profit which showed a highly significant influence on IPO success and failure patterns from the univariate analysis did not show any significant statistical influence based on the multivariate analysis	
	Firm specific characteristics. • Company's age and gross proceeds have a significant relationship with the success and failure patterns of IPOs on the JSE. • However, the industry was found to have no significant relationship between IPO success and failure	**Issue related characteristics** • Market period is the only factor that has a significant impact on the IPO success and failure patterns. • The Initial share price movement clearly has no significant influence on the success and failure patterns of IPOs.
	Market related characteristics • MBV and P/E ratio have no significant impact on the success	**Financial ratios.** • QR and ROE have a significant influence on

	and failure patterns of IPOs on the JSE. • However, when looking at the results from univariate regression analysis, it is observed that MBV can be used to explain the variations in IPO success and failure pattern	IPO success and failure patterns. • When looking at the results from univariate regression analysis, it is observed that NP can be used to explain the variations in IPO success and failure patterns. • The result from the multivariate reveals that the NP does not have any significant statistical influence on IPO success and failure patterns when combined with other factors. • Moreover, other financial factors like the TAT, ROA and CR also show no significant statistical influence on IPO success or failure both in a univariate and multivariate analysis

From table 7.55, it established that the MP, Age, GP and QR are the factors which have a significant relationship with the success and failure patterns of IPO on the JSE. Moreover, the NP, ROE and MBV were also identified as factors which individually have an impact on success and failure patterns of IPO on the JSE. All of these factors will be tested in a

structural equation model (SEM) to determine which of these factors can be used to predict the success and failure patterns for IPOs on the JSE.

7.6.5.4. Structural Equation Model for IPO success and failure patterns

As mentioned above, SEM is a technique which combines factor analysis and multivariate regression models to estimate relationship between observable variables and unobservable (latent) variables. The results of SEM for the success and failure pattern are presented below;

Figure 7.14: Structural Equation Model Path diagram for IPO success and failure pattern
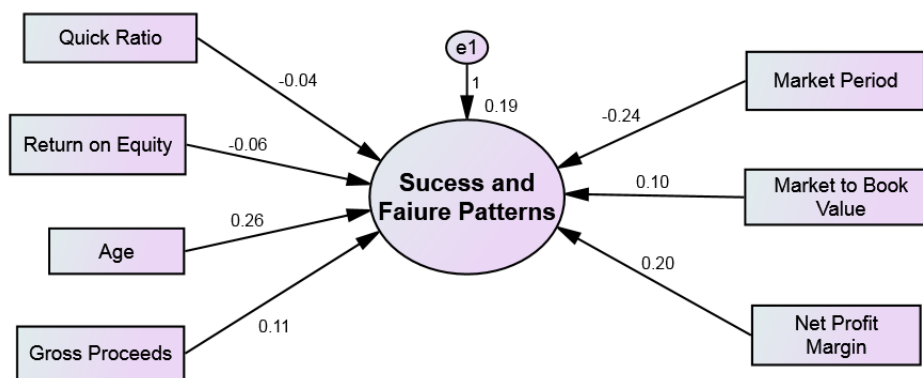
The SEM path diagram in Figure 7.14 indicates the different path coefficients explaining the relationship between the selected explanatory variables and IPO success and failure patterns. The negative path coefficients indicate a negative relationship while the positive path coefficients indicate a positive relationship. It is seen that the market period, quick ratio, and the return on equity have a negative relationship with IPO success and failure patterns. The company's age, gross proceeds, market to book value, and the net profit margin have a positive relationship with IPO success and failure patterns. The significance of each of the relationships established in the path diagram is indicated in Table 7.56 below.

Table 7.56: Causal relationship structural equation model for IPO success and failure pattern

Causal Relationship		Factor	Estimate	S.E.	C.R.	P	Label
Success and Failure Patterns	<---	Gross Proceeds (GP)	.115	.055	2.094	.036	Significant
Success and Failure Patterns	<---	Firm Age	.152	.030	5.001	***	Significant
Success and Failure Patterns	<---	Market Period(MP)	-.553	.117	-4.747	***	Significant

Success and Failure Patterns	<---	Market to book value (MBV)	.159	.085	1.870	.061	Significant
Success and Failure Patterns	<---	Net Profit Margin (NP)	.495	.138	3.584	***	Significant
Success and Failure Patterns	<---	Quick Ratio (QR)	-.045	.060	-.754	.451	N.S
Success and Failure Patterns	<---	Return On Equity (ROE)	-.162	.128	-1.261	.207	N.S

N.S means non-significant relationships

Figure 7.14 and Table 7.56 show the results of the causal relationships between the independent variables and IPO success and failure patterns. The SEM analysis indicates that the factors which significantly predict IPO success and failure patterns are: the MP, the company's age, NP, GP and MBV. The results are consistent with the findings from other studies (Carpentier and Suret, 2007:2; Demers and Joos 2006:15; Peristiani and Hong, 2004:5; Hensler, Rutherford and Springer, 1997; Carpentier and Suret, 2007: 17; Boubakri et al., 2005: 6, Demer and Joos, 2006:17). Carpentier and Suret (2007:2) and Demers and Joos (2006:15) established that the size of IPO and gross proceeds was positively related to the survival rates of new issues while Hensler, Rutherford and Springer (1997) established that a company's age at the time of listing is positively related to its long run survival. The market period indicates a strong negative relationship with IPO success and failure patterns which is consistent with other studies (Carpentier & Suret, 2007: 17; Boubakri *et al.,* 2005: 6, Demer & Joos, 2006:17). These studies highlighted that hot market IPOs were characterized by high failure rates and low survival and success rates when compared to cold market IPOs. Furthermore, the positive relationship indicated by the net profit margin and the MBV confirm that as the net profit or market to book value increases, the company's probability of success increases. Lastly, the ROE and QR do not show any significant causal relationship with IPO success and failure patterns.

7.6.5.5. Conclusion on SEM for IPO success and failure patterns

The summary of the key findings on of the SEM based on IPO success and failure patterns is presented below:

Table 7.57: The summary of the key findings on the SEM based on IPO success and failure patterns

Factors that significantly influence IPO success and failure patterns
Age (positive relationship)
Market period (negative relationship)
Gross proceeds (positive relationship)
Net profit margin (positive relationship)
Market to book value (positive relationship)

The results on Table 7.57 show that factors such as the market period, age, gross proceeds, net profit margin and market to book value are the factors that have a significant relationship with IPO success and failure patterns.

7.7. CHAPTER SUMMARY

This chapter was divided in to four parts. Part A focused on IPO underpricing where it was established that IPOs on the JSE are underpriced with an average market-adjusted returns of 78.10%, 78.57% and 82.81% for the first day, first week and first month respectively and these results are significant at a 1% level. Also evident is the fact that IPOs on the JSE were more underpriced in the hot markets than during the cold market periods, which is consistent with similar studies conducted on the JSE. Furthermore, the financial and technology sectors recorded a high level of underpricing when compared to IPOs in the mining and other sectors.

Part B examined the three, five and ten year performance (BHAR and CAR) of IPOs using the market model, the CAPM model and the Fama and French three factor model. The results showed that IPOs on the JSE underperform the market over a three and five year period using all three models. However, the positive yearly returns identified in year four and five provide an incentive for investors to stay out of the stock market within the first three years and come in during the fourth year and possibly sell by the end of the fifth year, so as to make profits. The positive returns in the fourth and fifth years give an indication that the IPO companies have had time to adjust to the market and the problem of asymmetric information no longer becomes relevant and the market now reacts to the true behaviour of IPOs in long term. In addition, the results for the ten year long run performance revealed that overall IPOs on the JSE outperform the market over a ten year period using the CAPM model. When using the

CAR, IPOs on the JSE outperform the Fama and French three factor model and market model. Also evident is the fact that positive returns are earned from the fourth years, which provide a positive incentive for investors to buy mainly portfolios comprising of companies that have been trading for at least four years.

Part C focused on the IPO long run returns. This study classified IPO returns into absolute and relative returns, and grouped absolute and relative returns. A cross sectional analysis was performed where statistical analysis such as chi-square, ANOVA, principal component analysis, regression analysis and SEM were performed. With regards to absolute and relative returns, it was established that the market period, company's age, market to book value and the operating profit margin can significantly predict both the absolute and relative long run IPO returns. The results also indicate that the current ratio can only significantly predict the absolute returns. The company's age has a positive relationship with absolute and relative long run IPO returns. The market period, market to book value and the operating profit margin and the current ratio have a negative relationship with absolute returns and relative long run returns. With regards to grouped absolute and relative returns, it was established that the market period, the company's age, gross proceeds, net profit margin and initial share price movements can significantly predict both the grouped absolute and relative long run IPO returns. The results also indicate that the current ratio can only significantly predict the grouped absolute returns. The current ratio has a negative relationship with grouped absolute returns. The market period has a negative relationship with grouped relative returns while company's age, gross proceeds, net profit margin and initial share price movements have a positive relationship with grouped relative returns.

Part D examines the IPO success and failure patterns. A cross sectional analysis was performed using various statistical analysis such as correlation analysis, principal component analysis, regression analysis and SEM were performed. Based on analysis this study established that the market period has a negative relationship with IPO success and failure patterns. Also, the company's age, gross proceeds, market to book value, and the net profit margin have a positive relationship with IPO success and failure patterns.

In chapter eight, the discussion, conclusion and recommendations of the study will be presented.

CHAPTER EIGHT

CONCLUSION AND RECOMMENDATIONS

8.1. INTRODUCTION

As stated in chapter one, the overriding purpose of this study was to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the JSE. To accomplish this objective, it became necessary to reach certain complimentary secondary objectives. Focusing on the research problem, the empirical objectives of the study therefore were to appraise the level of initial underpricing on the JSE; to appraise the three, five and ten year long run performance of IPOs on the JSE; to investigate if the differences in long run performance result from the choices of methodology, to determine whether market related characteristics (P/E and M/B) can be used to predict long run returns and success and failure of IPOs on the JSE; to examine whether the issue related characteristics (hot and cold markets periods, and initial share price movements) can be used to predict long run returns and the success and failure of IPOs on the JSE; to determine whether firm specific characteristics (gross proceeds, company's age and industry) can be used to predict long run returns and the success and failure of IPOs on the JSE; and lastly to determine whether pre-financial ratios can be used to predict long run returns and the success and failure of IPOs on the JSE. The findings from this study have identified a set of IPO characteristics that can be used to predict IPO long run returns and differentiate between successful and failed IPOs on the JSE. The research has also found that there are significant differences in the results on three years, five years and ten years IPO long run performance based on the methodology used (market model, the CAPM model, and the Fama and French three factor model).

The purpose of this chapter is to provide conclusions and possible recommendations based on the theoretical and empirical findings established in this study, bring out significant findings in relation to the research objectives and provide possible suggestions and implications for future research. This chapter is divided in to six sections. The first part of this chapter provides a general overview and introduction to the chapter. Thereafter, conclusions on the theoretical and empirical chapters are presented. Subsequently, achievements of the primary and secondary objectives are discussed. In addition, this chapter will highlight the recommendations, the limitations of the study, and identify the areas for further research.

8.2. CONCLUSIONS ON THE THEORITICAL CHAPTERS

The theoretical chapters of the thesis are made up of five chapters. The conclusions of the chapters are presented below.

8.2.1. Introduction to the study (chapter one)

This chapter highlighted a broad overview of this thesis. Here it was established that IPOs are associated with some interesting empirical patterns. An IPO is when a private company chooses to go public by selling its shares in the stock market for the first time (Amadeo, 2012). An IPO was identified as a platform that offers a fresh source of capital that is vital for the growth of the company and provides the company and existing shareholders a liquid market for their shares. From an investor's perspective, an IPO gives investors an opportunity to share in the rewards of the growth of the company (Foerster, 2003:45). Two of the most important anomalies of the IPO market are the high positive initial returns (underpricing) and the long run underperformance. Underpricing was viewed as one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity in the level of underpricing across markets and regions. Moreover, empirical evidence revealed that IPOs tend to underperform the market in a three to five year period subsequent to the listings. This study observed that the issue of underpricing and long run underperformance of IPOs seemed to be relevant to most countries, regardless of the time period investigated

The high rate of initial underpricing is detrimental to both the company and existing shareholders since they are not able to attract much needed capital to either finance their investment projects or to harvest as means to get out of the business and ideally reap the value (cash flow) from their investment. Also, the long run underperformance of IPO shares hurts the investors, since they do not get an opportunity to earn superior long term returns from their investments. The high rate of initial underpricing and long run underperformance have been accompanied by high failure rates and low success rates of IPOs all around the world. The high IPO failure rate has made the IPO market unattractive for companies wishing to go public and this has resulted in a large decline in IPO volumes in stock markets. The high IPO failure rate has made the IPO market unattractive for companies wishing to go public and this has resulted in a large decline in IPO volumes in stock markets (Gao, Ritter and Zhu, 2012:22)

In improving the IPO selection process, several factors and characteristics have been identified to be key determinants for predicting IPO returns, and IPO success and failure, although with contradicting results. IPO characteristics, such as the company's age, timing of the issue (hot and cold market periods), issue price, profitability, market capitalisation, offer size, gross proceeds, leverage, price to book value (P/B), market to book value (M/B), financial and non-financial ratios, pre-IPO performance and technical riskiness seem to be potentially significant determinants of IPO short and long run returns as well as the determinants of IPO success and failure (Hughes & Lee, 2006:5, Sohail & Raheman, 2009:63; Sahoo & Rajib, 2010: 27; Durukan, 2002; Demer & Joos, 2006:17; Carpentier & Suret, 2007:2). From the above, it was necessary to find out which IPO characteristics can be used to predict IPO returns on the JSE and differentiate between successful and failed IPO companies.

Moreover, based on the problem statement, the primary and secondary objectives were established. Furthermore, the chapter provided the contributions of the study. In addition, the chapter highlighted the research methodology, the limitations of the study and the outline of the chapters.

8.2.2. Understanding IPOS: a general overview (chapter two)

This chapter provided the background to this study. This chapter began by examining the role of stock exchange in facilitating the IPO process. The stock market was identified as one of the most significant markets to investors and shareholders since it is here that the price of stocks and the value of all publicly owned companies are established. The stock market was divided into primary and secondary markets. The primary market was defined as a market where investors purchase newly issued securities, which usually takes place during an IPO where companies offer stock for sale to the public for the first time. A secondary market is the market where investors trade previously issued securities either directly with other investors, indirectly through a broker who negotiates the transactions for others or directly with a dealer who buys and sells shares. The stock exchange was also identified to provide benefits to the company, investors and the society. To companies, the stock exchange ensures that companies whose shares have been listed on a stock exchange enjoyed a better goodwill and credit-standing because they are financially sound. To investors, the stock exchange created a platform for investors to enjoy the convenience of buying and selling shares at will and also provides regular information on prices of securities traded at the stock exchanges.

To the society, the stock exchange provided a lucrative avenue for investment and liquidity and thus encourages people to save and invest in long-term securities. These factors attested to the central role of the stock exchange in facilitating the IPO process and enabling IPO companies in achieving their numerous motives.

Also, the history of IPOs highlighted the history of the stock market is full of remarkable events that have earned their own names, such as the "Great Crash" of 1929, the "Tronics Boom" of the early 1960s, the "Go-Go Years" of the late 1960s, the "Nifty Fifty" bubble of the early 1970s, the "Black Monday" crash of October 1987, the "Dot.com" bubble of the 1990s. Also evident was the fact that there had been substantial fluctuations both in terms of the number of companies going public and the capital raised over time, with factors (investors sentiments, the adverse-selection costs of issuing equity and capital demands) identified as reasons accounting for these variations. This means that there are important factors or motives explaining why companies choose to go public rather than staying private. In understanding the motives why companies choose to go public, this study recognised primary motives (financing and harvesting) and secondary motives (public relation tool and talent attraction) for going public and these motives are often specific to each company. It was established that the primary motives for going public provides an opportunity for alternative sources of equity and debt financing for businesses that are constrained in their ability to raise equity or debt capital, and finally a time for its owner's to cash in on all their hard work. The secondary motives enabled businesses to increase the public's knowledge of the company's existence and in the process of getting public attention, attract highly qualified human talents. While all of these motives are important, the main goal for every company going public is however to raise capital. Nonetheless, before going public, a company needs to consider its advantages and disadvantages before making a decision.

Moreover, the literature on the advantages and disadvantages of going public emphasised that there are numerous advantages and disadvantages of going public. While the benefits of going public not only help companies to raise capital for current and future projects (which does not need to be repaid); it also enables companies to increases its liquidity and reduces the uncertainty about the value of the company. Staying private, on the other hand allowed a company to have complete control over its business, not entitled to disclosing information to the public and not incur any direct or indirect cost associated with going public. Nevertheless, the capital raised by private companies using equity or debt financing is subject to fixed

interest which has to be repaid and their shares are not liquid and cannot actively be traded on public exchanges. In spite of the disadvantages of going public, many companies find that going public is the most effective way to expand their business quickly without the use of debt financing. This study concluded by stating that the question of whether to go public rests solely in the hands of the company. Before deciding whether or not to go public, companies should evaluate all of the potential advantages and disadvantages that will arise and determine if it is in the best interest of the company. If a company is not in a good position to go public, the decision may actually hurt the company more than it helps. Even though capital is raised from the offering, the costs of setting up and sustaining public companies are high, and should be taken into consideration before making a decision. Moreover, the success of the going public necessitates selecting the right participant, since they are several classes of participants involved in the IPO process.

Furthermore, the existing shareholders, the issuing company, the underwriters, the investor and the Securities and Exchange Commission (SEC) were identified as the key players on the IPO process. They were all found to play a critical role to ensure the effective functioning and success of the IPO process. While the existing shareholders play important role in controlling key aspects of a business, they are also the people who make a decision when a company reaches a threshold at which the capital needed to finance their expansion and growth can no longer be provided by the founding shareholders alone. Existing shareholders see going public as a way to overcome this constraint and diversify their sources of finance. The issuing company are the people that provide all the necessary documentation required to prepare the registration document and are very actively involved in all aspects of the registration process. Their main objective is to maximise proceeds, build a broad stable ownership base, raise the company's profile to facilitate future fund raising, possible future acquisition, and ensure that there is good liquidity in the secondary market for trading. The underwriters are third-party intermediaries representing the interest of both the issuing company and the investors.

Selecting the right underwriter is one of the single most important decisions the company and existing shareholders will make as part of the IPO process. Given that no underwriter can guarantee that an IPO will be successful, the existing shareholders and company can increase the likelihood through its choice of the underwriters they select (firm commitment and best effort commitment). Firm commitment is usually preferred to best effort commitment

because the underwriter agrees to buy all issues shares, irrespective of their abilities to sell them at a particular price. Also, given that the underwriter's reputation depends on the success of IPO, they do everything in their power to ensure they sell the shares. Moreover, in selecting the right underwriter it becomes imperative that companies and existing shareholders consider criteria such as track record, reputation and experience, team members, commitment to the company, distribution reach and mix, aftermarket support, client satisfaction, economic factors, financial strength and stability as relevant factors in choosing from among competing underwriters. Furthermore, before investors, make an investment decision; it is very imperative that they have a basic knowledge about the company they want to invest in, while also taking into consideration the business fundamentals, the objectives and policies of the business, the business current market shares, its product/ services offerings and its competitors (Guleria, 2010). Selecting the right company will enable the investors to reap the value from their investment in a long run. In addition, because companies usually want their shares to be traded on either the stock exchange or other established markets at the completion of the offerings (Machmeier *et al.,* 2006), the companies going public must make certain that they adhere to the initial listing standards that must be met for quotation on each exchange, and ongoing standards for continuous listing.

The last part of this chapter examined the JSE and its standards for listing. The Johannesburg Securities Exchange was found to be a platform which enables the ease of trade for companies listed in South Africa, while also ensuring that these companies operate within stipulated rules and regulations. The JSE has two boards: JSE Main Board and JSE Alternative (AltX) board. The main board is meant for listed companies who have a minimum subscribed capital of R25 million (determined by the fair value of the assets), an assessed profit history of R8 million over the past three years and the listed company should have an excess of 20% issued capital. AltX is a nursery for the JSE main board, which was aimed at replacing the unsuccessful venture capital and development capital boards established as sub-divisions of the main board in the 1980s. When looking at the listing criteria on the JSE, it was observed the JSE main board and AltX criteria for listing were different and that certain criteria's have been reduced on the JSE AltX. Also, it was established that each stock market sets its own listing standards. As such, before a company becomes listed initially, it must adhere to all the minimum financial and non-financial standards for that particular stock market.

8.2.3. IPO Returns (chapter three)

This chapter began by making a distinction between absolute and relative returns. Beuaumont (2004:150) views absolute returns as the returns (gain or loss on an investment portfolio) that a particular asset achieves over a certain period which is not compared to other measures or benchmarks. Relative returns are returns whose performance is evaluated relative to a benchmark or an index, while absolute returns are the returns which are managed without references to a particular benchmark or an index. It was recommended that investors should focus on both absolute and relative returns as both strategies when combined provide a more attractive risk to return profile.

Thereafter, this study examined initial abnormal returns (underpricing). Underpricing occurs when the closing price at the end of the first day of trading is higher than the initial offer price (Heeley, Matusik & Neelam, 2006:2). Literature studies showed that IPOs on average have a high initial return on the first day of trading. It was also evident that underpricing is one of the most prominent abnormalities that have been acknowledged in most financial markets, irrespective of the time period investigated. This necessitated the need to find possible explanations for these high initial returns. Theories such as the winner's curse, the bandwagon effect, the signalling hypothesis, the ownership dispersion hypothesis, the leaving a good taste hypothesis, the lawsuit avoidance hypothesis and the investment banker's monopsony of power hypothesis were provided as explanations for the occurrence of these high positive abnormal returns at the end of the first trading day. From these theories, it was established that all the explanations on underpricing occur as result of information asymmetry on the part of the uninformed investors and or by underwriters trying to keep up to their end of a bargain on the firm commitment. The uninformed investors usually have limited information about the issuing company prior to going public. As a result, in order to entice the uninformed investors to buy all the shares, the underwriters underprice the shares so as to compensate the uninformed investor. Consequently, some of the uninformed investors will either get a fraction of the most desirable issues, or be allocated with most of the least desirable issues. Moreover, the uninformed investors usually make investment decisions based on the decisions of other investors on the market. If there is a trend showing that a lot of investors purchase a particular share, uninformed investors might also buy it though it would never happen based on his/her own analysis. Conversely, uninformed investors will not buy shares if they observe that other investors are not buying the shares even when they have favourable information about the company. The underwriters on their part usually make

a decision between firm commitment and best effort commitment when accepting a company for initial listing. Based on the firm commitment arrangement, underwriter agrees to buy all issues shares, irrespective of their abilities to sell them at a particular price. A best efforts contract requires the underwriter to buy only enough shares to fill investor demand. Based on the firm commitment, the underwriter accepts no responsibility for unsold shares. In the case where underwriters agree to the firm commitment, they will do everything in their power to ensure they sell the shares seeing that their reputation depends on the success of the issue. Thus, they underprice the shares in order to entice the uninformed investors to buy all the shares.

Subsequently, existing theories and concepts on long run underperformance were examined. Yuhong (2010:2) asserts that long run underperformance means that "relative to other companies, investors appear to lose out by continuing to hold the shares of a company that have recently gone public". Based on the literature, it was established that IPOs tend to underperform in a three to five year period subsequent to the listings. Theories such as the fad hypothesis, the overestimate hypothesis, and the earning management hypothesis were used as explanations for the occurrence of long run negative returns (underperformance). Based on the literature on the possible explanations for the long run underperformance phenomenon, it is observed that the long run underperformance can be explained by the irrational over optimism of investors. Given that there is usually limited information prior to going public, investors usually judge the company's real value based on the company's past performance contained in the prospectus. However, when this temporal over optimism finally fades and the company's information is gradually revealed, the newly floated companies will not be able to meet up with its expectations and hence underperform the market in the long run. Moreover, when the theories on underpricing and long run underperformance were compared, it was established that underpricing and long run underperformance can be explained more by information asymmetry and investors over optimism than the deliberate underpricing by underwriters.

8.2.4. Theories and concepts on IPO success and failure (chapter four)

This chapter examined concepts and theories of IPO success and failure. Starting with a review on the approaches to IPO success, the literature revealed that there are various theories such as initial mispricing, capital market success, superior knowledge and IPO success and other theories relating to the specific characteristics of the business can be used to predict IPO success. Also evident is that all of these approaches take in to consideration

the development of stock prices and/ or specific characteristics of a business (age, the level of education, size, market capitalization, underwriter reputation and post-IPO long term performance and profitability). Amid the most widely used IPO success measures are post-IPO long term performance and profitability which researchers (Ritter, 1991; Orman, 2005 and Wilbon, 2003) suggest are a strong measurement of IPO success.

With regards to IPO failure models, theories on the accounting based bankruptcy prediction model, the market's pricing of distress risk and Gambler's Ruin Model, were identified as models that can be used to predict IPO failure. All of these models use market price and/ or accounting financial data (earnings before interest and tax to total assets, working capital to total assets and retained earnings to total assets) as valuable predictor of failure. However, most studies (Agarwal & Taffler, 2006:2; Beaver *et al.,* 2005:115) have questioned the use of accounting-based model in predicting IPO failure. These studies argue that accounting variables may not be informative in predicting the future and are also liable to manipulation by management. Market variables on the other hand are unlikely to be influenced by business accounting policies and reflect future expected cash flows which are appropriate for prediction purposes.

When comparing the IPO success models to that of IPO failure models, it is observed that while the IPO success model places emphasis on stock prices and/ or specific characteristics of a business, the IPO failure models focus on market price and/ or accounting financial data. Hence, it is imperative for investors, existing shareholders, companies, auditors, managers, lenders, and analyst to use both the IPO success and failure predictor variables since they are interlinked (i.e. in predicting IPO success, they will be indirectly predicting IPO failure and vice versa).

8.2.5. Determinants of IPO returns and IPO success and failure (chapter five)

This chapter examined the determinants of the IPO long run returns (short and long run) and IPO success and failure. IPO characteristics were classified in to firm characteristics (gross proceeds, company's age and industrial sector); issue related characteristics (initial share price movement and IPO market periods); market related characteristics (P/E and M/B) and financial ratios. While some studies found some of these IPO characteristics to have a positive relationship with IPO returns and IPO success and failure, others found a negative relationship with these variables.

The literature reviews on the firm specific characteristics (gross proceeds, company's age and industrial sector) were examined. With regards to gross proceeds, researchers (Gounopoulos, *et al.,* 2008; Deb & Vijaya, 2010; Kooli & Suret, 2002) indicated that the smaller the size of the issue, the higher the level of underpricing. With regards to the impact of the size on the long run performance, findings by (Kaya (2012:73; Govindasamy, 2010:57-58) suggest that the larger the offer size, the lesser the level of underpricing and the worse off the long run performance. Moreover, other studies (Carpentier & Suret, 2007:2; Demers & Joos 2006:15; Kooli & Meknassi, 2007:39) found that small-sized IPOs had a high failure rate. The age of a company was established to have a positive relationship with IPO returns (Younesi, Ardekani & Hashemijoo, 2012:141; Ahmad-Zaluki & Abiding, 2011:322; Merikas, Gounopoulos & Nounis, 2009:14). By way of contrast, other studies by (Shikha & Balwinder, 2008:1; Kaya (2012:70) established that a company's age had no significant relationship with long run returns. Moreover, other studies by (Carpentier & Suret 2011; Demers & Joos 2007; and Hensler *et al.,* 1997) established that younger companies experience a higher post issue failure rate. In addition, with regards to the industry, several studies (Allen *et al.,* 1999:226; Kaya, 2012:73; How, 2000; Kooli & Meknassi 2007:4; Ahmad 2012:7:17) observed differences in initial returns and aftermarket returns between the different industries and the success and failure patterns. These studies found that the returns in emerging industries (biotechnology, semiconductor and internet IPOs) after a year were worse than those of non-emerging industry, but nevertheless, the performance for both industries were negative. Moreover, IPOs in the technology sectors experienced high failure rates and low survival rates.

With regards to the issue related characteristics (initial share price movement and IPO market periods), previous studies on the hot and cold market period, (Alti, 2005; Almisher, Buell & Kish, 2002; Van Heerden & Alagidede, 2012:130) revealed that IPOs are more underpriced in hot market periods than in the cold market periods. Helwege and Liang (2004) highlighted in their study that IPOs issued in hot market period had poor long run performance. With regards to IPO success and failure, Amini and Keasey (2011:14) observed that companies that went public during hot market periods had a high probability of failing in a shorter period of time than IPOs issued during the cold marker periods. With respect to initial share price movement, Kiweu (1991) on the Nairobi Stock Exchange using price data collected from Nairobi Stock Exchange in order to determine the behaviour of share prices established empirically that there were no reported patterns in share price movement.

The literature reviews on the market related characteristics (P/E and M/B) and financial ratios were examined. While financial ratios (ROA, ROE, EBIT, M/B, P/E, Total asset turnover, debt to equity) were established to have a positive relationship with underpricing, long run performance and IPO success and failure (Hasan & Hadad, 2013:93; Razafindrambinina & Kwan, 2013:208; Peristiani & Hong,2004:5; Demer & Joos,2005:22); others studies found that some of these ratios had no relationship with underpricing, long run performance and IPO success and failure (Amini & Keasey, 2011:21; Andersson & Westling, 2009:18; Chiraphadhanakul & Gunawardana, 2012:19.5).

Based on these theoretical research findings, an integrated framework was provided that identified a combination of IPO characteristics that was tested to find out which ones can be used to predict IPO long returns and the success and failure patterns of IPOs on the JSE.

8.2.6. Research methodology (chapter six)

The chapter aimed at explaining the research methodology pursued in the empirical study. The research process was divided into six stages. Possible explanations and justifications were provided for adopting specified methods and processes. A total of 313 IPO companies over a period of 1996-2007 were used in this study and this information was sourced from McGregor-BFA database. The data was analysed using Microsoft Excel and SPSS statistical software. Descriptive statistical tools like percentages, frequency distribution tables, histograms and charts were used for interpreting the data. Furthermore, inferential statistics, such as cross tabulation, chi-square, ANOVA, t-test, multiple regression analysis, Pearson correlation coefficient and structural equations were also used for analytical purposes.

8.3. CONCLUSIONS ON EMPIRICAL FINDINGS (chapter seven)

The conclusion on the empirical findings will be presented based on IPO underpricing, IPO long run performance, the long run IPO returns, and IPO success and failure patterns.

8.3.1. IPO Underpricing

Underpricing is one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity regarding underpricing across markets and regions. From the results in chapter seven, it was established that IPOs on the JSE are underpriced with an average market-adjusted returns of 78.10%, 78.57% and 82.81% for the first day, first week and first month respectively and these results are significant at the

1% level. The high level of underpricing on the JSE is consistent with international evidence of high levels of underpricing in most financial markets around the world (Loughran *et al.,* 2010:1-2). Also, when comparing the level of underpricing on the first day, first week and first month, it was established that the abnormal return on the first day is only marginally lower than the first month return, indicating little incentive not to sell on the first day of trading. Furthermore, the high level of underpricing on the JSE gives the impression that underpricing can be explained by investor over-optimism, the bandwagon effect, and the winner curse.

Alm *et al*. (2009:11-12) state that the IPO market may be subject to the bandwagon effect which is viewed as a situation when investors do not only take investment decisions based on their own information about an IPO, but based on other investors (usually the informed or the institutional investors). Underwriters underprice an issue in order to entice the first few potential investors to purchase, which portrays positive information about the issue and thus persuade the later investors to follow them. Rock (1986) put forth a winner's curse model to explain IPO underpricing based on asymmetric information between informed and uninformed investors. Rock elucidated that because of uncertainty in the value of the company, there is asymmetric information between informed and uninformed investors. Informed investors usually have information about the competitors, future regulatory reforms, and the general conditions of the economy and financial markets that the issuing company does not have and thus are able to make a better assessment regarding the long term value of the company. Uniformed investors might have sufficient funds to invest in a specific IPO, but are often not willing to participate because of the adverse selection problem (Draho, 2004:182-184). Consequently, in order to entice the uninformed investors to buy the shares, the underwriters underpriced the shares so as to compensate the uninformed investor (Malakhov, 2007:7). Lattimer (2006:238) examined the short-run equity underpricing puzzle in South Africa with an emphasis on the winner's curse hypothesis and concluded that the winner's curse is strongly evident on the JSE, which is consistent with the assertion of this study.

With regards to IPO underpricing based on the hot and cold market periods, this study established that IPOs on the JSE are substantially more underpriced in the hot markets than in the cold market periods, which is also consistent with prior studies (Lawson & Ward, 1998; Lattimer, 2006; Alti, 2005; Almisher, Buell & Kish, 2002). Moreover, these high levels of

underpricing on the JSE and especially in hot markets confirm that investors who buy their shares at the offer can benefit significantly more by investing in IPOs issued during the hot market periods. Also, only five (1997-1999 and 2006-2007) of the 12 years (1996-2007) investigated were regarded as hot market periods with 246 IPOs listed in these two hot market periods, clearly indicating that companies are attempting to time their initial listings. This assertion is based on the window of opportunity hypothesis which argues that there are usually periods when investors are optimistic about the growth potential of companies going public and the large cycles in volumes may indicate a response by companies attempting to time their IPOs to take advantage of these swings in investor sentiment (Ritter, 1998:17). Rhee (2002:9) affirms that because investors are irrationally over-optimistic when trading starts, companies distinguish between those periods when investors are optimistic and go public when the market is offering them a more favourable valuation.

Focusing on the IPOs in different sectors, it was established that there is a substantial difference in the level of underpricing across the four industries. The financial sector and technology sector were more underpriced than companies in the mining and other sectors. The high level of underpricing in the technology sector confirms the findings by Ritter (1991:4), Lyungqvist and Wilhelm (2003:738) and Karlis (2002:83) that the high tech and internet related companies suffer from ex-ante uncertainty and thus are usually more underpriced. The mining sector appears to be less underpriced than the financial, technology and other sectors, which contrast with findings by Ritter (1991:4) and Kooli and Suret (2002:4).

To conclude, IPOs on the JSE have been established to have high levels of underpricing, which is consistent with international evidence of high underpricing on most financial markets around the world. Also, this study established that IPOs on the JSE are substantially more underpriced in the hot markets than in the cold market periods. The high level of underpricing on the JSE gives the impression that underpricing can be explained by investor over-optimism, the bandwagon effect, and by the winner curse. Moreover, the substantially high level of underpricing in the hot market period suggests that companies on the JSE are attempting to time their initial listings. Thus, investors can profit by buying the new issues at the offer price and selling them at the end of the first day of trading.

8.3.2. Long run performance

The conclusions on the long run performance for the three, five and ten year based on the three models as well as the conclusions on the differences in methodology used in calculating long run performance will be provided.

8.3.2.1. Three years long run performance

The three year long run performance was calculated for the offer price and first trading day using the market model. The results based on the offer price for both the BHAR and CAR, showed that IPOs on the JSE outperformed the market in the first year (58.21% and 75.43% respectively). This result indicates that investors who bought the shares at the offer price and held the shares for one year, made significant profits. However, when looking at the BHAR strategy, it is discouraging for investors to hold the shares for longer periods as the second and third year returns are negative (-0.87% and -48.73%). Although the CAR also showed a decreasing trend in the IPO returns over the years, the performance is still positive for the second (38.91%) and third (24.43%) year indicating that investors who buy at the offer price are still able to earn positive returns at the end of the third year. Nonetheless, this result should be interpreted with great caution as Barber and Lyon's (1997) established that BHAR yields negatively biased test statistic and CAR yields positively biased test statistic.

The long run performance using the closing market price at the first trading day established that for both the BHAR and CAR, IPOs on the JSE underperform the market over a three year period. The negative returns starting from year one shows that the effect of the huge initial underpricing has diminished and all indications are that the market overacted to the offer price. This result suggests that investors who did not get the chance to buy their shares at the offer price (mostly individual investors) do not benefit from the abnormal returns and thus incur substantial losses starting from year one (using both BHAR and CAR). Moreover, also established is the fact that when using the CAPM model and Fama and French three factor model, IPOs on the JSE underperform the market over a three year period and the underperformance is worse in the third year. These results indicate that overall IPOs on the JSE underperform the market over a three years period using the market model, the CAPM model and the Fama and French three factor model. These findings are consistent with other international studies on long run performance (Govindasamy, 2010:1; Karlsson & Sköld, 2006:4; Santos, 2011:7) which provides evidence that IPOs tend to underperform in a three year period subsequent to the listings.

The high level of long run underperformance over a three year period (using the first trading day) gives the impression that the long run underperformance of IPOs on the JSE might be caused more by investors' over-optimism. This high over-optimism by investors on the JSE conforms with the "fad" hypothesis and thus it can be concluded that the long run underperformance of IPOs on the JSE can be explained by the fad hypothesis. Based on the fad hypothesis, market participants generally overreact to good news and under react to bad news. If the share price at the time of the IPO is too high, the market gradually recognises its mistakes and corrects its behaviour in the future. Ritter (1991:4) notes that the fads hypothesis postulates that IPOs may be correctly priced but investors overvalue the new issues in the early aftermarket. Brav *et al.* (2000:29) provide evidence in support of the role of investors' over-optimism in explaining the long run underperformance, which is consistent with the overreaction hypothesis, which assumes that in the long run, the market corrects the over-valuation caused in the initial period. As a result, the underperformance of IPOs in the long run can be explained by the fact that under the hypothesis of efficient markets, the price of IPOs should reach their equilibrium price leading to a negative correlation between initial returns and long term performance of IPOs (Shiller, 1990). Likewise, Miller (1977) advances the divergence of opinion hypothesis to explain the underperformance of IPOs. He advocates that optimistic investors are usually the people who buy shares and in a situation where there is a great amount of uncertainty about the value of an IPO, optimistic and pessimistic investors will have some difference in opinions. As the level of information about the true value of the IPO increases with time, the divergence of expectations decreases and the prices are consequently adjusted downwards resulting in a negative relationship between the ex-ante uncertainty and the aftermarket performance.

To conclude, the results indicated that overall IPOs on the JSE underperform the market over a three year period using the market model, the CAPM model and the Fama and French three factor model which is consistent with other international studies (Govindasamy, 2010:1; Karlsson & Sköld, 2006:4; Santos, 2011:7). The results on the three years long run performance based on the offer price for both the BHAR and CAR showed that IPOs on the JSE outperform the market in the first year (58.21% and 75.43% respectively). This result indicates that investors who bought the shares at the offer price and held the shares for one year, made significant profits, but these profits are made on the first day of trading. The long run performance using the closing market price at the first trading day established that for both the BHAR and CAR, IPOs on the JSE underperform the market over a three year period.

Moreover, also established is the fact that when using the CAPM model and Fama and French three factor model, IPOs on the JSE underperform the market over a three year period. This high level of long run underperformance over a three year period gives the impression that the long run underperformance of IPOs on the JSE might be caused more by investor's over-optimism. This over-optimism by investors on the JSE conforms to the "fad" hypothesis and thus it can be concluded that the long run underperformance of IPOs on the JSE can be explained by the fad hypothesis. Based on these findings, this study suggests that in order for investors to make profits, they should buy IPOs issued in the hot market period at their offer prices and sell of the first trading day.

8.3.2.2. Five years long run performance

The results of the five year long run performance revealed that there are significant differences in the results on IPO long run performance based on the three models used. When using the market model (CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 28.80% and 7.77% respectively. The positive yearly returns for CAR identified in year four and five provide an incentive for investors to come in during the fourth year and possibly sell by the end of the fifth year. When using the market model (BHAR), the level of underperformance drastically increases in year two and year three but remains relatively stable in year four and year five. The stability in IPO performance for the fourth and fifth year can be explained by the positive returns established in year four and five. The BHAR however yields only slightly positive returns within years four and five given investors little incentive to come in at the beginning of the fourth year and sell by end of the fifth year.

When looking at the CAPM results (using CAR), it is observed that there is a drastic increase in the level of underperformance in year two and year three. The level of underperformance in year four and year five however drastically reduces to 29.56% and 7.63% respectively. When using the BHAR, the level of underperformance drastically increases in year two and year three, but remains relatively stable in year four and year five. Also, when looking at the Fama and French results (using BHAR and CAR), it is established that there is a drastic increase in the level of underperformance from year two to year five. The trends in the results on the CAPM are similar to those of the market model.

To conclude, the results indicate that overall IPOs on the JSE underperform the market over a five year period using the market model, the CAPM model and the Fama and French three factor model, which is consistent with other international studies (Gomper & Lerner, 2003:2; Kooli & Suret, 2004:65; M'kombe & Ward, 2002:11-12). However, the positive yearly returns identified in year four and five provide an incentive for investors to stay out of the stock market within the first three years after listing and come in during the fourth year and possibly sell by the end of the fifth year, so as to make profits. The positive returns in the fourth and fifth years give an indication that the IPO companies have had time to adjust to the market and the problem of asymmetric information no longer becomes relevant and the market now reacts to the true behaviour of IPOs in the long run.

8.3.2.3. Ten year long run performance

The results on the ten year long run performance showed that there are significant differences in the results on IPO long run performance based on the three models used. From this study it was established that IPOs on the JSE outperform the market when using the CAPM model by 4.62% and 130.33% (for BHAR and CAR respectively). Also, when using CAR, IPOs on the JSE outperform the market when using the Fama and French three factor model (26.06%) and market model (116.23%). Moreover, investors on the JSE are only able to earn a positive risk to return trade-off compensation for any extra risk they bear in the stock market from the fifth year when using the CAPM model (using CAR), ten years (using BHAR) and from the sixth year when using the Fama and French model (using CAR). These results provide a positive incentive for investors to buy mainly portfolios comprising of companies that have been trading for at least four years.

To conclude, the results indicate that overall IPOs on the JSE outperform the market over a ten year period using the CAPM model by 4.62% and 130.33% (for BHAR and CAR respectively). When using CAR, IPOs on the JSE outperform the market when using the Fama and French three factor model (26.06%) and market model (116.23%). Also evident is the fact that positive returns are earned from the fourth year, which provide a positive incentive for investors to buy mainly portfolios comprising of companies that have been trading for at least four years Moreover, this finding suggest that investors should change their investment strategy to a 10 year holding period, rather than three or five years

8.3.2.4. Differences in methodology

The results on the long run performance of IPOs on the JSE demonstrated that the performance of IPOs vary across all the models used. A paired sample t-test was used to find out if there are any significant difference in three, five, and ten year long run performance based on the market model, the CAPM model and the Fama and French three factor model. The results showed that the market model and CAPM produced similar trends with similar results. In particular, the paired sample T-test for the five year performance indicated that there was no significant difference ($p = 0.713$) between the market model BHAR versus the BHAR for the CAPM. However, the Fama and French results were significantly different from the CAPM and the market model for both BHAR and CAR. When comparing the Fama and French and the CAPM results, it was seen that the five year and ten year performance using the Fama and French was worse than the results obtained from the CAPM for both BHAR and CAR. These results are similar to the findings by Saleh and Mashal (2008:43) who also established that the level of underperformance when using the Fama and French was worse than when using the CAPM for a five year period. Barber and Lyon (1997) established that BHAR yields negatively biased test statistic and CAR yields positively biased test statistic. These findings stress the effect the different benchmarks and methodologies play when calculating the long run performance of IPOs. Various studies (M'kombe & Ward 2002; Fama, 1998; Sun, 2004; Alvarez & Gonzalez 2001) emphasized that long run underperformance of IPOs depended on the methodology used. This assertion was also confirmed with the paired sample T-test which indicated that the long run performance of IPOs was significantly different based on the model used.

To conclude on which model is the better method for calculating long run performance, studies by Lam (2005:1-2) and Hu (2003:19) while comparing the CAPM and the Fama and French using different statistical analysis have concluded that neither is better than the other, since different sets of data and periods yield different results. Fama and French (2004:25) maintain that one of the significant attractiveness of the Capital Asset Pricing Model (CAPM) is that it offers a powerful prediction on measurement of risk and the relation between expected return and risk. Krause (2001:48-49) argues that the CAPM is a static model, which assumes the investment horizon to be a single period. Ritter and Welch (2002:32, 35) emphasize that the Fama and French three factor model is usually contaminated especially in periods of high IPO issuing. Eckbo (2010:163) elucidates that one attractive feature of using the BHAR is that the buy and hold returns provide an accurately and better measure for

investors since it represents an actual investment experience than the monthly rebalancing required in the other approaches used in measuring risk adjustments. According to Smith (2008:43), the Institute of Charted Financial Analyst (CFA institute) and SEC recommend that investment professionals, mutual funds and portfolio managers use the geometric (BHAR) approach to calculate IPO returns when reporting their performance. To conclude on which model is a better method for calculating long run performance, this study acknowledges that all three models have their advantages and disadvantages. As a result, investors are recommended to use the model they are most comfortable with. These differences in models create a great opportunity for future research to determine which model is the best especially with regards to ascertaining the accuracy of the predicting power of each model for the long run performance of IPO on the JSE.

8.3.3. IPO long run returns

The results on the absolute and relative returns revealed that the average returns for absolute and relative returns were both negative in the long run. The long run relative returns (-73.42%) are worse than the long run absolute returns (-6.82%). These results on the grouped absolute and grouped relative returns established that the majority of IPOs on the JSE generally have poor negative long run returns (both in absolute and relative terms). Researchers (Loughran & Ritter, 1995:23; Govindasamy, 2010:42; Bessler & Thies, 2007) observed that investors earned poor long term returns which are consistent with the findings of this study.

Furthermore, in identifying which IPO characteristics can predict long run returns, ANOVA was conducted to determine if there is any significant relationship between the absolute/relative returns and IPO characteristics. Chi square was used to find out if there is any relationship between the grouped absolute/grouped relative returns and IPO characteristics. Also, a regression analysis and structural equation modelling were performed. The regression analysis was divided into univariate regression analysis and multivariate regression analysis. The univariate regression analysis was based on selected factors while the multivariate regression analysis was based on each individual grouping of IPO characteristics (firm specific characteristics, issue related characteristics, market related characteristics and financial ratios). Moreover, a principal component analysis (PCA) was performed on the market related characteristics and financial ratios. Based on the ANOVA, chi-square, PCA and regression analysis, the results on the absolute and relative returns and

grouped absolute and relative returns were presented based on the classifications of IPO characteristics (firm specific characteristics, issue related characteristics, market related characteristics and pre-financial ratios).

The firm specific characteristics identified were gross proceeds, the company's age and the industry in which the company was listed. Based on the results from the statistical analysis, industry was found to have no significant relationship with absolute and relative returns, and grouped absolute and grouped relative returns. This finding is consistent with a study by Kaya (2012:73) who found that the performance of IPOs does not differ based on industry. Also, with regards to gross proceeds, the results revealed that gross proceeds have no significant relationship with absolute and relative returns. However the gross proceeds was found to have a significant positive relationship with grouped absolute and grouped relative returns, suggesting that companies with larger gross proceeds provide better (positive) returns than those with smaller gross proceeds. These results are in line with those of Drobetz *et al.* (2005) and Govindasamy (2010:57-58) who also established in their research that companies with smaller gross proceeds had poorer relative returns in the long run than larger companies. By way of contrast Cai, Liu and Mase (2008) established that companies with smaller gross proceeds in China showed better long run returns than companies with larger gross proceeds. Moreover, the company's age was identified to have a significant positive relationship with absolute and relative long run IPO returns. These results are contrary to the study by Goergen, Khurshed and Mudambi (2007:402) and Shikha and Balwinder (2008:1) who did not find any statistically significant relationship between the age of a company and its long run relative returns.

The issue related characteristics identified were IPO market periods and initial share price movement. The results established that initial share price movements have no significant relationship with either absolute or relative long run returns. However, initial share price movement was identified to have a positive relationship with grouped relative returns. With regards to the market periods (hot and cold market), the results clearly indicated that market periods have a significant negative relationship with both absolute and relative long run returns, as well as the grouped absolute and grouped relative long run returns. These results indicate that IPOs issued during the cold market period produce significantly better returns in the long run than IPOs issued during the hot market periods. These results are consistent with other studies by Thomadakis *et al.* (2011) and Gounopoulos (2011:19) who established that

hot market IPOs performed worse in the long run than IPOs issued in the cold market period. Researchers Ahmad (2012:7) and Loughran and Ritter (2004) maintain that hot market periods are usually characterised by an excess demand for new issues which attract lower quality issuers. As such one will expect the companies that go public during such periods of high demand to be of a lower quality and thus are more likely to have poor long run returns.

The market related characteristics identified are price to earnings ratios (P/E) and market to book value (M/B). The P/E was found to have no significant relationship with absolute and relative long run returns. This finding contradicts with a study by Zamanian, Khodaparati and Mirbagherijam (2013:69) which showed that the P/E ratio is one of the significant determinants explaining abnormal long-run returns of IPOs companies in Iran. Furthermore, the M/B was established to have a significant negative relationship with absolute and relative long run returns. This is consistent with the findings by Mulyono and Khairurizka (2009:49) which highlighted that the market to book value had a significant impact on IPO long run returns.

The pre financial ratios identified were current ratio, quick ratio, operating profit margin, net profit margin, return on asset (ROA), return on equity (ROE), total asset turn over and debt to equity ratio. The results showed that the operating profit margin and the current ratio have a significant negative relationship with absolute and relative long run returns, while the quick ratio, ROA, ROE, total asset turn over and debt to equity ratio have no significant relationship with absolute and relative long run returns. With regards to the grouped absolute and relative returns, the current ratio was found to have a significant negative relationship with grouped absolute returns. The net profit margin was found to have a significant positive relationship with grouped relative returns. Razafindrambinina and Kwan (2013:208) observed in their study that financial ratios such as ROA, current ratio, debt to equity ratio, and total asset turnover cannot be used to explain IPO long run returns, which conforms with the findings of this study (with the exception of current ratio).

To conclude, when looking at the IPO characteristics that can be used to predict IPO long run returns on the JSE, it was established that not all of the IPO characteristics can be used to predict absolute and relative long run returns, or grouped absolute and grouped relative long run returns. With regards to absolute and relative returns, it was established that the market period, company's age, market to book value and the operating profit margin can significantly predict both the absolute and relative long run IPO returns. The results also

indicate that the current ratio can only significantly predict the absolute returns. The company's age has a significant positive relationship with absolute and relative long run IPO returns. The market period, market to book value and the operating profit margin and the current ratio all have a significantly negative relationship with absolute returns and relative long run returns. With regards to grouped absolute and relative returns, it was established that the market period, the company's age, gross proceeds, net profit margin and initial share price movements can significantly predict both the grouped absolute and relative long run IPO returns. The results also indicate that the current ratio has a significant negative relationship with grouped absolute returns. The market period has a negative relationship with grouped relative returns while company's age, gross proceeds, net profit margin and initial share price movements have a positive relationship with grouped relative returns. It is therefore advisable for investors to consider these factors when selecting specific IPOs for their portfolios.

The summary of statistical analysis based on absolute and relative long run returns and grouped absolute and relative returns is presented in Table 8.1 and Table 8.2 below.

Table 8.1: Summary of statistical analysis based on absolute and relative long run returns

Dependent variable : Grouped absolute and relative long run returns										
Summary of statistical analysis										
Independent variables	**Chi-square**		**Univariate Regression**		**Multivariate Regression (Selected factors Model)**		**Multivariate Regression(Specific characteristic Model)**		**Structural equation model (SEM)**	
	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative
Market period	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig	Sig
Industry	-	-	-	-	-	-	-	-	-	-
Gross proceeds	Sig.	Sig.	Sig.	Sig.	-	-	Sig.	Sig.	Sig	Sig
age	Sig.	-	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig	Sig
initial share price movement	-	-	-	-			Sig	Sig	Sig	Sig
	Component factor analysis									
P/E	-		-	-	-	-	-	-	-	-
Market to book value	Sig.		-	-	-	-	-	-	-	-
Net profit	Sig.		Sig.	Sig.	-	Sig.	-	Sig.	Sig	Sig

margin									
Operating profit margin	Sig.	-	-	-	-	-	-	-	-
Quick ratio	Sig.	Sig.	Sig.	-	-	-	-	-	-
Current ratio	Sig.	Sig.	Sig.	-	-	-	-	Sig	-
ROA	Sig.	-	-	-	-	-	-	-	-
ROE	Sig.	Sig.	Sig.	-	-	-	-	-	-
Total asset turn over	Sig.	-	-	-	-	-	-	-	-
Debt to equity ratio	-	-	-	-	-	-	-	-	-

Table 8.2: Summary of statistical analysis based on grouped absolute and relative long run returns

Dependent variable : Grouped absolute and relative long run returns										
Summary of statistical analysis										
Independent variables	**Chi-square**		**Univariate Regression**		**Multivariate Regression (Selected factors Model)**		**Multivariate Regression(Specific characteristic Model)**		**Structural equation model (SEM)**	
	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative	Absolute	Relative
Market period	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig	Sig
Industry	-	-	-	-	-	-	-	-	-	-
Gross proceeds	Sig.	Sig.	Sig.	Sig.	-	-	Sig.	Sig.	Sig	Sig
age	Sig.	-	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig	Sig
initial share price movement	-	-	-	-			Sig	Sig	Sig	Sig
	Component factor analysis									
P/E	-		-	-	-	-	-	-	-	-
Market to book value	Sig.		-	-	-	-	-	-	-	-
Net profit margin	Sig.		Sig.	Sig.	-	Sig.	-	Sig.	Sig	Sig
Operating profit margin	Sig.		-	-	-	-	-	-	-	-
Quick ratio	Sig.		Sig.	Sig.	-	-	-	-	-	-
Current ratio	Sig.		Sig.	Sig.	-	-	-	-	Sig	-
ROA	Sig.		-	-	-	-	-	-	-	-
ROE	Sig.		Sig.	Sig.	-	-	-	-	-	-
Total asset turn over	Sig.		-	-	-	-	-	-	-	-
Debt to equity ratio	-		-	-	-	-	-	-	-	-

8.3.4. Success and failure patterns

The objective of this study was to differentiate between successful and failed companies on the JSE and also to find out which IPO characteristics can be used to predict success and failure patterns of IPOs on the JSE over a five year period. In differentiating between successful and failed companies on the JSE, the results revealed that there were more survival (60.65%) and failed (20.97%) IPO companies on the JSE than acquired (8.06 %) and success (10.32%) companies. This trend of high failure rate and low success rate on the JSE was also found to be similar in other stock markets such as the US and Canada. However, a higher percentage of companies (60.65%) on the JSE survive over a five year period compared to both Canada and the US.

Furthermore, in identifying which IPO characteristics can predict long run returns, a correlation analysis was conducted to determine if there are any significant relationships between the IPO success and failure patterns and selected IPO characteristics. Also, a series of regression analyses and structural equation modelling were also performed. The regression analysis was divided into univariate regression analysis based on selected factors and multivariate regression analysis based on each individual grouping of IPO characteristics (firm specific characteristics, issue related characteristics, market related characteristics and financial ratios). Moreover, a principal component analysis (PCA) was performed on the market related characteristics and financial ratios. Based on the correlation analysis, PCA and regression analysis, the results on the success and failure patterns are presented based on the classifications of IPO characteristics (firm specific characteristics, issue related characteristics, market related characteristics and pre-financial ratios).

The firm specific characteristics identified were gross proceeds, the company's age and the industry in which the company was listed. Based on the results from the statistical analysis, industry was found to have no significant relationship with IPO success and failure patterns. Also, the company's age and gross proceeds have a significant positive relationship with IPO success and failure patterns. The findings indicate that while the probability of failure is higher amongst younger companies; the probability of success increases with the company's age. These findings are consistent with other studies (Carpentier & Suret 2011; Demers & Joos 2007; and Hensler *et al*., 1997), which also established a positive relationship between the company's age, gross proceeds and IPO success and failure. Also, the advantage of older companies prior to going public is that investors can be able to make informed decisions

based on prior and existing knowledge they have about the company. Amini and Keasey (2011:3) also observed that older companies had a lower probability of failure in Canada and the UK. This in culmination with the findings of this study is a clear indication that a company's age prior to going public is a vital aspect and should be considered by investors in their IPO selection process. With regards to gross proceed, the results indicate that while the probability of failure increases for IPOs that have a smaller issue size; the probability of success increases for IPOs that have a larger size. These results are in line with other studies (Chou *et al.,* 2006:14; Kooli & Meknassi, 2007:39). It is therefore advisable for investors to consider the size of the IPO when selecting portfolios. Smaller size IPOs are riskier investments and other factors, like the company's age, should also be considered when choosing to invest in such companies.

The issue related characteristics identified were IPO market periods and initial share price movements. The results established that initial share price movement has no significant relationship with IPO success and failure patterns. The market period (hot and cold market) was established to have a significant negative relationship with IPO success and failure patterns. This result indicates that IPOs issued during the hot market period have a high probability of failure and a lower probability of success than IPOs issued during the cold market periods. These results are consistent with other studies (Carpentier & Suret, 2007:17; Boubakri *et al.,* 2005:6; Demer & Joos, 2006:17), which observed a similar trend of high failure rates during hot market periods compared to cold market periods. Researchers Ahmad (2012:7) and Loughran and Ritter (2004) maintain that hot market periods are usually characterized by an excess demand for new issues which attract lower quality issuers. As such one will expect the companies that go public during such periods of high demand to be of a lower quality and thus are more likely to fail. This is in line with the 'window of opportunity" or overvaluation hypothesis (Ritter, 1991; Loughran & Ritter, 1995; Boubakri *et al.*, 2005:8) which states that during hot periods, there are more issuers seeking to benefit from the window of opportunity so as to maximise their gross proceeds. These issuers recognise periods in which the equity market levels are relatively high to enable them raise capital at lower costs, which results in IPO volume peaks. This gives room for low-quality companies with the incentive to go public regardless of the risk of not being able to withstand periods of economic downturn and thus increases their probability of failure. With this trend in mind investors can maximise their returns by buying IPOs listed in the cold market periods because of the higher likelihood of success in the long run.

The market related characteristics identified are price to earnings ratios (P/E) and market to book value (M/B). The market to book value was found to have a significant positive relationship with IPO success and failure patterns. The positive relationship shown by the M/B indicates that as the market to book value increases, the company's probability of success increases. The P/E was found to have no significant relationship with IPO success and failure.

The pre-financial ratios identified were current ratio, quick ratio, operating profit margin, net profit margin, ROA, ROE, total asset turn over and debt to equity ratio. The results showed that net profit has a positive relationship with IPO success and failure pattern. The positive relationship indicated by the net profit indicates that as the net profit margin increases, the company's probability of success increases. Moreover, other financial ratios such as current ratio, quick ratio, operating profit margin, ROA, ROE, total asset turn over and debt to equity ratio were found to have no significant relationship with IPO success and failure patterns. These findings are contrary to those of Demer and Joos (2005:22) who found that the total asset turnover had a significant positive relationship with the likelihood of failure for companies in the non-tech, combined high tech and Internet, and high tech sectors.

In conclusion, when looking at the IPO characteristics that can be used to predict IPO success and failure patterns on the JSE, it is observed that the market period has a significant negative relationship with IPO success and failure patterns. Also, the company's age, gross proceeds, market to book value, and the net profit margin have a significant positive relationship with IPO success and failure patterns. With regards to the theories on IPO success and failure, this study identifies theories related to the specific characteristics of a business (gross proceeds, and company's age) and accounting based bankruptcy prediction model (market to book value and the net profit margin) to be the models that can be used to explain IPO success and failure patterns on the JSE. The accounting-based bankruptcy prediction models take into consideration a company's past performance as a base for predicting the company's future likelihood of survival (Xu & Zhang, 2009). However, most studies (Agarwal & Taffler, 2006:2; Beaver, McNichols & Rhie, 2005:115) have questioned the use of accounting-based model in predicting IPO failure. These studies concluded that accounting variables may not be informative in predicting the future and are also liable to manipulation by management. Market variables, on the other hand, are unlikely to be influenced by business accounting

policies and reflect future expected cash flows which are appropriate for prediction purposes, which create an opportunity for further research.

With respect to the specific characteristics of the business that might affect a business success, Jain, Jayaraman and Kini (2008) established that an increase in a company's age, number of employees, pre-IPO investor demand and governance considerations are all linked with a higher probability of success, estimated by post-IPO profitability. Carpentier and Suret (2009) found that the main indicators which are associated with a company's survival and success propensity are profitability, size, market capitalization and stock prices. Yap (2009:5) and Jain, Jayaraman and Kini (2008) further established that IPO success is measured by focusing on the post-IPO long term performance and that the determinants of IPO success are the company's age and offering size. It is therefore advisable for investors to consider these factors when selecting their portfolios.

The summary of statistical analysis based on IPO success and failure patterns is presented in Table 8.3

Table 8.3: Summary of statistical analysis based on IPO success and failure patterns

Dependent variable : IPO success and failure patterns					
Summary of statistical analysis					
Independent variables	**Correlation**	**Univariate Regression**	**Multivariate Regression (Selected factors Model)**	**Multivariate Regression(Specific characteristic Model)**	**Structural Equation Model (SEM)**
Market period	Sig.	Sig.	Sig.	Sig.	Sig.
Industry	-	-	-	-	-
Gross proceeds	Sig.	Sig.	-	Sig.	Sig.
Age	Sig.	Sig.	Sig.	Sig.	Sig.
Initial share price movement	-	-	-	-	-
	Component factor analysis				
P/E	-	-	-	-	-
Market to book value	Sig.	Sig.	-	-	-
Net profit	Sig.	Sig.	-	-	Sig.

margin					
Operating profit margin	Sig.	-	-	-	-
Quick ratio	Sig.	Sig.	Sig.	Sig.	-
Current ratio	Sig.	-	-	-	-
ROA	Sig.	-	-	-	-
ROE	Sig.	Sig.	-	Sig.	-
Total asset turnover	Sig.	-	-	-	-
Debt to equity ratio	-	-	-	-	-

8.4. ACHIEVEMENT OF OBJECTIVES

This section measures the success of the study against the research objectives formulated in chapter one. The primary objective is to find out which IPO characteristics can be used to predict IPO returns and explain the differences in the success and failure patterns of IPO companies on the JSE. The primary objective was achievement based on the attainment of the secondary objectives.

The first secondary objective was to review the literature on IPOs and the decision to go public. This objective was achieved in chapter two. This chapter began by examining the role of stock exchange in facilitating the IPO process. Also, the history of IPOs was examined. Moreover, the motives for going public, as well as the advantages and disadvantages of going public were examined. Furthermore, the chapter examined the roles of the key participants in the IPO process. In addition, the Johannesburg Securities Exchange (JSE), and the procedures for listing were discussed in detail.

The second secondary objective was to review theoretical concepts on IPO underpricing and IPO long run performance. This objective was achieved in chapter three of the literature review. Chapter three made a distinction between absolute and relative returns. Also, existing theories and concepts on IPO underpricing and long run performance were examined. Theories such as the winner's curse, the bandwagon effect, the signalling hypothesis, the ownership dispersion hypothesis, the leaving a good taste hypothesis, the lawsuit avoidance hypothesis and the investment banker's monopsony of power hypothesis were provided as explanations for underpricing. With regards to long run performance, theories such as the fad

hypothesis, the overestimate hypothesis, and the earning management hypothesis were provided as explanations for long run underperformance

The third secondary objective was to examine existing literature on IPO success and failures on various stock markets. This objective was achieved in chapter four of the literature review. Theories on IPO success such as initial mispricing, capital market success, superior knowledge and IPO success and other theories relating to the specific characteristics of the business were explained. Also theories on IPO failure such as accounting based bankruptcy prediction model, the market's pricing of distress risk and Gambler's Ruin Model were explained.

The fourth secondary objective was to review the literature on the determinants of IPO returns and IPO success and failure markets in both developed and developing countries. This objective was achieved in chapter five of the literature review. The IPO characteristics were classified in to firm specific characteristics (gross proceeds, company's age and industrial sector); issue related characteristics (initial share price movement and IPO market periods); market related characteristics (P/E and M/B) and financial ratios. These IPO characteristics were found to be significant determinants of the IPO returns and the success and failure of IPOs. While some studies found some or all of these IPO characteristics to have a significant relationship with IPO returns, IPO success and failure, others found a no significant relationship between these variables. Based on these establishments, there was the need to find out which of these IPO characteristics can be used to predict long run returns and the success and failure patterns of IPOs on the JSE.

The fifth secondary objective was to appraise the level of initial underpricing on the JSE. This objective was achieved in part A on the empirical findings in chapter seven (sub section 7.3).

The sixth secondary objective was to appraise the three, five and ten year performance of IPOs on the JSE. This objective was achieved in part B on the empirical findings in chapter seven (sub section 7.4).

The seventh secondary objective was to investigate empirically if the differences in long run performance result from the choices of methodology (different techniques and formulas to measure return). This objective was achieved in part B on the empirical findings in chapter seven (sub section 7.4 to7.4.2).

The eighth secondary objective was to determine whether market related characteristics (P/E and M/B) can be used to predict long run returns and success and failure of IPOs on the JSE. This objective was achieved based on the results of the findings in chapter seven. The results established that M/B has a significant negative relationship with absolute returns and relative long run returns. Also, it was established that the P/E cannot be used to predict both the absolute and relative long run returns. With regards to IPO success and failure patterns, M/B was found to have a significant positive relationship with IPO success and failure patterns.

The ninth secondary objective was to examine whether the issue related characteristics (hot and cold markets periods, and initial share price movements) can be used to predict long run returns and the success and failure of IPOs on the JSE. The market period was established to have a significant negative relationship with absolute and relative long run returns and grouped absolute and grouped relative long run returns. Also, the market period was found to have a significant negative relationship with IPO success and failure patterns. Furthermore, with regards to initial share price movement, the results established that initial share price movement has a significant positive relationship with grouped relative returns. However, initial share price movement has no significant relationship with IPO success and failure patterns.

The tenth secondary objective was to determine whether firm specific characteristics (gross proceeds, company's age and industry) can be used to predict long run returns and the success and failure of IPOs on the JSE. The results revealed that the company's age and gross proceeds have a significant positive relationship with grouped absolute and grouped relative returns. Also, the company's age and gross proceeds were found to have a significant positive relationship with IPO success and failure patterns. The industry was however found to have no significant relationship with either the long run returns or the IPO success and failure patterns.

The eleventh secondary objective was to determine whether pre- financial ratios can be used to predict long run returns and the success and failure of IPOs on the JSE. This study established that out of the eight financial ratios (ROE, ROA, total asset turnover, current ratio, quick ratio, operating profit margin, net profit margin and debt to equity ratio) considered; the current ratio and operating profit margin were found to have a significant negative relationship with absolute returns and relative long run returns. The net profit margin has a significant positive relationship with grouped absolute and grouped relative

returns. With regards to IPO success and failure patterns, the net profit margin was found to have a significant positive relationship with IPO success and failure patterns.

Based on the achievement of all the secondary objectives, it is concluded that the primary and secondary objectives of this study were achieved.

8.5. RECOMMENDATIONS

The recommendations will be provided based on the conclusions established in the theoretical and empirical findings. Recommendations will be based on IPO underpricing, IPO long run performance, IPO long run methodology, IPO long run returns and IPO success and failure patterns.

8.5.1. Recommendations on IPO underpricing

The findings indicated that IPOs in the JSE were highly underpriced which is consistent with findings from other stock markets. Also evident was the substantial difference in the level of underpricing between the hot and cold market periods. This indicates that investors wishing to take advantage of highly undervalued shares could successfully achieve this in the JSE. More particularly, it is recommended that during hot market periods, investors should buy the new issues at the offer price and sell them at the end of the first day of trading. The level on underpricing also varies across industry sectors with the financial and technology sectors having the highest level of underpricing on the JSE. These sectors are therefore highly attractive for uninformed investors who wish to take advantage of undervalued shares. However investors wishing to hold the shares for longer time periods should consider the possible poor long run performance in the technology and financial sectors established by prior studies on the JSE (Govindasamy, 2010: 48; Neneh & Smit; 2013:14-15).

8.5.2. Recommendations on IPO long run performance

Overall, IPOs in the JSE underperform over a three and five year period. However the trend is different for the ten year holding period as the CAPM indicates over performance for both the BHAR and the CAR. Also, CAR based on the market model and Fama and French three factor model also indicate significant over performance over a ten year holding period. It is thus recommended that investors should focus on investment strategies that cover a ten year holding period and not just a three or five year period. This study also established that when calculating the long run performance based on the offer price, the IPOs outperformed the

market at the end of the first trading year. As such, it is recommended that investors who consider a one year holding period should buy the shares at the offer price and sell by the end of the first year.

Also evident is the fact that positive returns are earned from the fourth year, which provide a positive incentive for investors to buy mainly portfolios comprising of companies that have been trading for at least four years. Moreover, with regards to the long term profits, investors are advised to stay out of the stock market within the first three years but come in during the fourth year and buy mainly portfolios comprising of companies that have been trading for at least four years. The advantage of this approach is that the investors can have enough information over the four year period of trading to make an informed decision on the quality of the portfolio. However, the disadvantage is that the investors can lose out on short run returns which could be earned by purchasing the IPO shares at the offer price and selling within the first trading year.

8.5.3. Recommendations on IPO long run methodology

Given the great discrepancy on how long run performance is calculated, investment professionals, mutual funds and portfolio managers are recommended to use the model they are most comfortable with. Nevertheless, they should preferable use the geometric (BHAR) approach to calculate IPO returns when reporting their performance as recommended by the Institute of Charted Financial Analyst (CFA institute) and SEC. Furthermore, with regards to the JSE, these differences in models create a great opportunity for future research to determine which model is the best especially with regards to ascertaining the accuracy of the predicting power of each model for the long run IPO performance on the JSE.

8.5.4. Recommendations on IPO long run returns

The market period, the company's age, market to book value and operating profit margin were identified as factors that significantly predict both the absolute and relative long run IPO returns. These results are in line with those of Drobetz *et al.* (2005) and Govindasamy, (2010:57-58) who also established in their research that gross proceeds have a significant relationship with IPO long run returns Also, other studies by (Thomadakis *et al.,* 2011; Gounopoulos, 2011:19) observed that the market periods have a significant relationship with IPO long run returns. Moreover, Mulyono and Khairurizka (2009:49) also highlighted that the market to book value has a significant impact on the IPO returns. The empirical evidence

from this study and other highlighted studies with similar results is a clear indication that these factors are important in understanding IPO long run returns. It is thus recommended that investors should consider these factors when making an investment decision, as these factors can act as an investor's guide for improving the IPO selection process.

8.5.5. Recommendation on IPO success and failure patterns

The market period, the company's age, gross proceeds, market to book value, and the net profit margin were identified as factors that can be used to differentiate successful from failed IPOs on the JSE. These findings were consistent with other studies (Carpentier & Suret 2011; Demers & Joos 2007; and Hensler *et al*., 1997), which also established a significant relationship between the company's age, gross proceeds and IPO success and failure. Furthermore, other studies (Carpentier & Suret, 2007: 17; Boubakri *et al.,* 2005:6; Demer & Joos, 2006:17) also observed a significant relationship between market periods and IPO success and failure patterns. As established in the results, a high percentage of hot market IPOs failed compared to cold market IPOs. It is therefore important for investors to consider all the basic fundamentals before investing in hot market IPOs. As such, it is recommended that investors should consider these factors when predicating a company's likelihood of success or failure on the JSE.

8.6. LIMITATIONS OF THE STUDY

The JSE All share index was used as the only benchmark as opposed to using other benchmarks such as the market capitalisation and book to market portfolio benchmarks. Also, a five year period was used to predict IPO long run returns and IPO success and failure patterns on the JSE. This study did not consider if these factors could also predict IPO returns in other time periods such as three years or ten years. Moreover, the firm specific characteristics, issue related characteristics; market related characteristics and selected financial ratios were used to predict IPO returns and IPO success and failure patterns. However, the macro-economic factors were not considered in this study.

8.7. AREAS FOR FURTHER STUDY

- This study used the five year period to find out which factors can be used to predict IPO returns and IPO success or failure patterns. Potential areas for future exploration could use the three year period to find out which factors can be used to predict IPO

returns and IPO success or failure patterns and whether the factors are the same for over a three and five year periods.

- The differences between the market model, the CAPM model and the Fama and French three factor model create a great opportunity for future research to determine which model is the best especially with regards to ascertaining the accuracy of the predicting power of each model for the long run performance of IPO on the JSE

- Additional studies could be conducted to find out what macro-economic factors can be used to explain IPO short and long run returns and IPO success or failure patterns on the JSE.

- Furthermore, given that the JSE All share index was used as the only benchmark in calculating the long run performance. Future research could use other benchmarks such as the book to market portfolio and the market capitalisation to find out if the results differ across the different benchmarks on the JSE.

- Lastly, future studies could examine the survival and acquired patterns of IPOs on the JSE since more emphasis on this study was placed on only the successful and failed IPOs.

8.8. CHAPTER SUMMARY

This chapter examined the conclusions; achievement of objectives, limitations and areas for further study with respect to IPO underpricing, IPO long run performance, IPO long run returns and IPO success and failure patterns.

IPOs on the JSE were established to have a high level of underpricing and the high level of underpricing on the JSE and especially in hot markets give the impression that underpricing can be explained by investor over optimism, the bandwagon effect, and the winner curse. Also, the results on the long run performance revealed that overall IPOs on the JSE underperform the market over a three and five year period using the market model, the CAPM model and the Fama and French three factor models. The results on the ten year performance indicated that IPOs on the JSE outperform the market over a ten years period using the CAPM model. Furthermore, with regards to the methodologies on calculating long run performance, the results demonstrated that the performance of IPOs varies across all the models used. The results showed that the market model and CAPM produced similar trends with similar results. However, the Fama and French results were significantly different from the CAPM and the market model for both BHAR and CAR.

The results on the absolute and relative returns revealed that the average returns for absolute and relative returns were both negative in the long run. These results on the grouped absolute and grouped relative returns established that the majority of IPOs on the JSE generally have poor long run returns (both in absolute and relative terms over five years). In identifying which IPO characteristics can be used to predict IPO long run returns on the JSE, it was established that the company's age has a significant positive relationship with absolute and relative long run IPO returns. The market period, market to book value and the operating profit margin and the current ratio have a significant negative relationship with absolute returns and relative long run returns. With regards to grouped absolute and relative returns, it was established that current ratio has a significant negative relationship with grouped absolute returns. The market period has a negative relationship with grouped relative returns while company's age, gross proceeds, net profit margin and initial share price movements have a significant positive relationship with grouped relative returns.

In addition, while differentiating successful from failed companies on the JSE, the results revealed that there were more survival and failed IPO companies on the JSE than acquired and success companies. In identifying which IPO characteristics can be used to predict IPO success and failure patterns on the JSE, it is observed that the market period has a significant negative relationship with IPO success and failure patterns. Also, the company's age, gross proceeds, market to book value, and the net profit margin have a significant positive relationship with IPO success and failure patterns. It is thus recommended that investors consider these factors when making an investment decision, as these factors can act as an investor's guide for improving the IPO selection process and also differentiating between successful IPO companies from failed ones.

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APPENDICES

Appendix 1: List of companies used in the study

Company Name	Year of Listing
Energy Africa Limited	1996
Clicks Group Ltd	1996
National Chick Limited	1996
Howden Africa holdings Ltd	1996
Enviroserv Holdings Limited	1996
Sweets From Heaven Holdings Limited	1996
Chillers Group Limited	1996
Carson Holdings Limited	1996
Buildmax Ltd	1996
Homechoice Holdings Limited	1996
Kalahari Goldridge Mining Company Limited	1996
Rebserv Holdings	1996
Alexander Forbes Group Limited	1996
Amlac Limited	1996
AFGRI Ltd	1996
Abacus Technology Holdings Limited	1996
Terexko Limited	1996
Netcare Ltd	1996
Celtron Technologies Limited	1997
Stocks Hotels & Resorts Limited	1997
Mustek Ltd	1997
Tourism Investment Corporation Limited	1997
Nando's Group Holdings Limited	1997
Amalgamated Appliance Holdings Ltd	1997
Saflife Limited	1997
BHP Billiton Plc.	1997
Afribrand Holdings Limited	1997
OTR Mining Limited	1997
Chester Investment Holdings Limited	1997
Computer Configurations Holdings Limited	1997
Connection Group Limited	1997
Southern Mining Corporation Limited	1997
MMW Technology Holdings Limited	1997
Woolworths Holdings Ltd	1997
Bonatla Property Holdings Ltd	1997
Excel Medical Holdings Limited	1997
Enterprise Risk Management	1997
Paragon Business Forms Limited	1997
O'Hagan's Investment Holdings Limited	1997
The House of Busby Limited	1997

Set Point Technology Holdings Limited	1997
Radiospoor Technology Holdings Limited	1997
Abraxas Investment Holdings Limited	1997
Retail Apparel Group Limited	1997
Molope Foods	1997
Astrapak Ltd	1997
ADvTECH Ltd	1997
Awethu Breweries Ltd	1997
Thabex Ltd	1997
Trematon Capital Investments Ltd	1997
Beige Holdings Ltd	1997
AMB Holdings Limited	1997
Wetherlys Investment Holdings Limited	1997
Chet Industry Limited	1997
Prima Toy and Leisure Group	1997
WineCorp Limited	1997
Aquila Growth Limited	1997
NE T1 Applied Technology Holdings Limited	1997
ITI Technology Holdings Limited	1997
African Media Entertainment Ltd	1997
Servest Holdings Limited	1998
Fashion Africa Limited	1998
Global Capital Limited	1998
Tridelta Magnet Technology Holdings Limited	1998
Barnard Jacobs Mellet Holdings Limited	1998
Infiniti Technologies Limited	1998
Renaissance Retail Group Limited Renaissance	1998
Top Info Technology Holdings Limited	1998
Technology Communication Holdings Limited	1998
Qala Group Limited	1998
IOTA Financial Services Limited	1998
MSI Holdings Limited	1998
Primeserv Group Ltd	1998
Lonrho Africa plc	1998
Truworths International Ltd	1998
Onelogix Group Ltd	1998
E-data Holdings Limited	1998
Zaptronix Ltd	1998
Iliad Africa Ltd	1998
Peregrine Holdings Ltd	1998
Real Africa Durolink Holdings limited	1998
Unifer Holdings	1998
Accord Technologies Limited	1998
Bryant Technology Limited	1998

Brimstone	1998
Nimbus Holdings Lmited	1998
Comair Ltd	1998
Core Holdings Limited	1998
Value Com Holdings Limited	1998
Global Village Holdings Limited	1998
Intertrading Limited	1998
Billboard Communications Limited	1998
Idion Technology Holdings Limited	1998
Kroondal KPM	1998
Viking Investments & Asset Management Limited	1998
EOH Holdings Ltd	1998
Aqua Online holdings	1998
MICROmega Holdings Ltd	1998
Crux Technologies Limited	1998
World Educational Technologies Limited	1998
IST Group Limited	1998
Gijima Ast Group Ltd	1998
UCS Group Limited	1998
Terrafin Holdings Limited	1998
Datacentrix Holdings Ltd	1998
Steinhoff International Holdings Ltd	1998
Emerald Topbrand Sports Limited	1998
Moresport Holdings Limited	1998
Adapt IT Holdings limited	1998
ConvergeNet Holdings Ltd	1998
Pentacom Holdings Limited	1998
Value Group Ltd	1998
Compu- Clearing Outsourcing Ltd	1998
Indequity Group Ltd	1998
Whetstone Industrial Holdings Ltd	1998
African Partnerships Limited	1998
EC Hold Limited	1998
Purple Capital Ltd	1998
OSI Holdings Limited	1998
Global Technology Limited	1998
Equinox Holdings Limited	1998
Securedata Solutions Limited	1998
Cape Empowerment Trust Limited	1998
Faritec Holdings Ltd	1998
Sotta Securitisation International Limited	1998
Sanlam Ltd	1998
Plasgroup Limited	1998
Digicore Holdings Ltd	1998

JEM Technology Holdings Limited	1998
Micrologix Limited	1998
Decomac Holdings Limited	1998
Metropolis	1998
ISA Holdings Ltd	1998
AH- vest Ltd	1998
Adrenna	1999
President Steyn Gold	1999
African Dawn Capital Ltd	1999
Conduit Capital Ltd	1999
Mercury Alpha Capital Limited	1999
Thuthukani Group Limited	1999
Tile Afrika Holdings Limited	1999
Gray Security Services Limited	1999
HIX Technologies Limited	1999
Women Investment Portfolio Holdings Limited	1999
Smacsoft Group Limited	1999
Taufin Holdings Limited	1999
Oxbridge Online Limited	1999
Dynamo Retail Limited	1999
Metorex Limited	1999
DNA Supply Chain Investment	1999
Millionair Charter Limited	1999
Cadiz Holdings Ltd	1999
SilverBridge Holdings Ltd	1999
Foneworx Holdings Ltd	1999
APS Technologies (Pty) Ltd	1999
Essential Beverage Holdings Limited	1999
Sekunjalo Investments Ltd	1999
AMB Private Equity Partners	1999
National Sporting Index Limited	1999
Streamworks Group Limited	1999
Acuity Group Holdings Limited	1999
Appleton Limited	1999
Noble Minerals Limited	1999
Stella Vista Technologies Ltd	1999
Forza Group Limited	1999
MoneyWeb Holdings Ltd	1999
Capital Shopping Centres Group	1999
Acumen Holdings Limited	1999
Aveng Ltd	1999
ShawCell Telecommunications Limited	1999
Old Mutual plc	1999
AG Industries Ltd	1999

Bynx Limited	1999
Intervid Limited	1999
Nedcor Investment Bank Holdings Limited	1999
Spearhead Property Holdings Limited	1999
Incentive Holdings Limited	1999
SecureData Holdings Ltd	1999
Fe Squared Holdings Limited	1999
Prada Technologies Limited	1999
Discovery Holdings Ltd	1999
Spur Corporation Ltd	1999
Primegro Properties Limited	1999
Century Carbon Mining Limited	1999
Command Holdings ltd	2000
Redefine Properties Ltd	2000
Square One Solutions Group Limited	2000
Allan Gray Property Investments Limited	2000
m Cubed Holdings Ltd	2000
Massmart Holdings Ltd	2000
THE INTERNET GAMING CORPORATION LIMITED	2000
Sempres International Technology Holdings Limited	2000
Remgro Ltd	2000
Tradehold Ltd	2000
ApexHi Properties Limited	2001
Astral Food	2001
Sa Retail Properties Limited	2001
Exxaro Resources Ltd	2001
Stratcorp Ltd	2001
Capitec Bank Holdings Ltd	2002
Acucap Properties Ltd	2002
African Rainbow Minerals Gold Limited	2002
iFour Properties Limited	2002
Phumelela Gaming and Leisure Ltd	2002
Investec Plc	2002
Resilient Property Income fund Ltd	2002
Beget Holdings Limited	2002
John Daniel Holdings Ltd	2003
Telkom SA Ltd	2003
Coronation Fund Managers ltd	2003
Ambit Properties Limited	2004
Business connexion Grp L	2004
Vukile Property Fund Ltd	2004
Morvest Business Group Ltd	2004
Lewis Group Ltd	2004
The Spar Group Ltd	2004

PSG Financial Service Ltd	2004
South Africa coal Mining holdings Ltd	2004
Cipla Medpro South Africa Ltd	2005
Verimark Holdings Ltd	2005
Wescoal Holding Ltd	2005
Siyathenga Property Fund Limited	2005
Chrometco Ltd	2005
Amalgamated Electronic	2005
BioScience Brands Ltd	2005
Tawana Resources NL	2005
Oando Plc	2005
CBS Property Portfolio Limited	2005
Miranda Mineral Holdings Ltd	2005
Uranium One Inc	2005
Wesizwe Platinum Ltd	2005
Primedia Limited	2006
Hospitality Property Fund A Ltd	2006
WG Wearne Ltd	2006
IFA Hotels and Resorts Ltd	2006
Esorfranki Ltd	2006
PSV Holdings Ltd	2006
Witwatersrand Consolidated Gold Resource Ltd	2006
Absa Bank Ltd Pref	2006
Metmar Ltd	2006
Sanyati Holdings Ltd	2006
Madison Property fund	2006
Taste Holdings Ltd	2006
Gooderson Leisure Corporation Ltd	2006
Blue Financial services Ltd	2006
Litha Health care Group Ltd	2006
IPSA Group Plc	2006
Afrimat Ltd	2006
Kumba Iron Ore Ltd	2006
Workforce Holdings Ltd	2006
Celcom Group Limited	2006
Accentuate Ltd	2006
Africa cellular Towers	2006
SAB&T Ubuntu Holdings Limited	2006
Zeder Investments Ltd	2006
Jubilee Platinium Plc	2006
Pamodzi Gold Ltd	2006
Tiger Automotive Limited	2006
Nutritional Holdings Ltd	2006
Atlatsa Resources Corporation	2006

Austro Group Ltd	2007
Rare Holdings Ltd	2007
South Ocean Holdings Ltd	2007
Alert Steel Holdings Ltd	2007
TeleMasters Holdings Ltd	2007
Raubex Group Ltd	2007
Kelly Group Ltd	2007
Country Bird Holdings Ltd	2007
Eastern Platinum Ltd	2007
Rolfes Holdings Ltd	2007
Ansys Ltd	2007
Interwaste Holdings Ltd	2007
Finbond Group Ltd	2007
Hulamin Ltd	2007
Mondi Ltd	2007
Mondi Plc	2007
William Tell Holdings Ltd	2007
B & W Instrumentation and Electrical Ltd	2007
Infrasors Holdings Ltd	2007
Stefanutti Stocks Holdings Ltd	2007
Brikor Ltd	2007
Protech Khuthele Holdings Ltd	2007
Huge Group Ltd	2007
IQuad Group Ltd	2007
1 Time	2007
Sea Kay Holdings	2007
Imbalie Beauty Ltd	2007
African Eagle Resources Ltd	2007
Ellies Holdings Ltd	2007
RBA Holdings Ltd	2007
Hardware Warehouse Ltd	2007
African Brick Centre limited	2007
RACEC Group Ltd	2007
BSI Steel Ltd	2007
Chemical Specialities Ltd	2007
SA French Ltd	2007
Central Rand Gold	2007
Kwikspace Modular Buildings Limited	2007
MiX Telematics Ltd	2007
Blue Label Telecoms Ltd	2007
KayDav group Ltd	2007
Calgro M3 Holdings Ltd	2007
ARB Holdings Ltd	2007
Mazor Group Ltd	2007

O-Line Holdings Limited	2007
TWP Holdings	2007
Consolidated Infrastructure Group Limited CIL	2007
Vunani Ltd	2007
Universal industries corporation Limited	2007
Rockwell Diamonds INC	2007
CIC Holding Limited	2007
Erbacon Investment Holdings Ltd	2007

Appendix 2: New sector classification showing original sector

New Category	JSE Classification
Financials	Asset management
	Consumer finance
	General finance
	Investment instruments
	Mortgage finance
	Investment service
	Real estate investment and service
	Speciality finance
	Banks
	Banks & Fin Services
	Banks & Other Fin. Ser.
	Financial Services
	Insurance
	Investment Banks
	Investment Trust
	Life Assurance
	Private Equity Funds
	Short term Insurance
	Speciality Finance
	VA Consumer Finance
	Venture Capital
	VA Other Financial
Mining	Aluminium
	Coal
	Diamonds & Gemstones
	General Mining
	Gold Mining
	Industrial Metals

	Mining
	Nonferrous Metals
	Platinum & Precious Metals
	Steel
	metals and mining
Technology	Cash Companies
	Computer Hardware
	Computer Services
	Electronics & Electrical sector
	Technology- electronic equipment
	information technology and media support services
	Technology Hardware & Equipment
	Software & computer science
	Telecommunications
Others	Industrial Goods & Services
	Manufacturing-paint and Coating
	Industrial - Media sector
	General business activities
	Beverages, Hotels and Leisure
	Transport sector
	constructions & Materials
	General Retailers
	Pharmaceutical & Biotechnology
	leisure and travel
	Consumer goods and services
	Airlines
	Building materials and fixtures
	Business support services
	Business training and employment agencies
	Farming and fishing
	Food producers
	Speciality chemicals
	Speciality retailers
	Support services
	Telecommunication equipment
	Telecommunications
	Waste and disposal services

Appendix 3: Three years long run performance using the Market Model (based on offer price and market price)

Months	Offer Price		First trading day	
	BHAR	**CAR**	**BHAR**	**CAR**
Three years long run performance using the Market Model (based on offer price and market price)				
1	84.09%	84.04%	-0.16%	-0.16%
2	83.69%	84.48%	1.50%	0.28%
3	77.41%	83.77%	1.93%	-0.43%
4	81.50%	82.81%	2.75%	-1.39%
5	88.43%	83.92%	7.98%	-0.29%
6	90.99%	83.98%	11.41%	-0.23%
7	88.03%	82.90%	10.79%	-1.30%
8	90.30%	81.81%	9.47%	-2.39%
9	88.29%	80.82%	7.04%	-3.39%
10	75.26%	80.58%	1.04%	-3.62%
11	63.39%	78.55%	-2.47%	-5.65%
12	58.21%	75.43%	-5.41%	-8.77%
13	49.70%	70.29%	-7.98%	-13.91%
14	49.79%	69.43%	-6.95%	-14.78%
15	46.74%	67.25%	-5.72%	-16.95%
16	50.16%	65.89%	-4.21%	-18.31%
17	47.66%	61.30%	-4.65%	-22.90%
18	45.31%	59.00%	-7.67%	-25.20%
19	35.33%	55.43%	-11.79%	-28.77%
20	25.90%	52.00%	-16.62%	-32.20%
21	19.46%	48.92%	-19.26%	-35.28%
22	14.08%	45.72%	-23.48%	-38.48%
23	4.64%	42.00%	-29.03%	-42.20%
24	-0.87%	38.91%	-33.20%	-45.29%
25	-6.39%	38.14%	-36.49%	-46.06%
26	-11.37%	36.85%	-43.13%	-47.35%
27	-9.81%	39.03%	-40.64%	-45.17%
28	-13.53%	36.29%	-41.82%	-47.91%
29	-21.05%	34.60%	-47.56%	-49.61%
30	-26.13%	33.08%	-48.34%	-51.12%
31	-32.21%	30.12%	-52.48%	-54.08%
32	-36.62%	28.60%	-55.90%	-55.60%
33	-40.43%	28.76%	-58.23%	-55.44%
34	-44.62%	25.87%	-61.06%	-58.33%
35	-46.27%	26.21%	-62.78%	-57.99%
36	-48.73%	24.43%	-65.59%	-59.77%

Appendix 4: Three years long run performance using CAPM Model and Fama and French Model

Three years long run performance using CAPM Model and Fama and French Model				
Months	**CAPM**		**Fama and French**	
	BHAR	CAR	BHAR	CAR
1	-0.22%	-0.22%	-3.16%	-1.19%
2	1.90%	0.61%	-3.35%	-1.07%
3	3.55%	1.13%	-3.78%	-1.10%
4	4.36%	0.23%	-5.29%	-3.16%
5	10.09%	1.59%	-2.99%	-2.80%
6	13.86%	1.94%	-1.47%	-2.72%
7	13.37%	0.92%	-3.11%	-3.27%
8	12.04%	-0.28%	-5.31%	-4.38%
9	8.93%	-1.76%	-8.53%	-5.51%
10	2.56%	-2.54%	-14.72%	-5.74%
11	-1.23%	-4.79%	-16.55%	-5.85%
12	-3.79%	-7.80%	-18.84%	-7.88%
13	-6.05%	-12.58%	-20.50%	-11.61%
14	-5.24%	-13.86%	-19.10%	-11.13%
15	-5.07%	-16.76%	-16.40%	-10.92%
16	-4.48%	-18.78%	-15.60%	-11.52%
17	-4.39%	-23.32%	-15.59%	-14.66%
18	-6.50%	-25.29%	-17.29%	-14.79%
19	-10.49%	-28.99%	-19.75%	-16.99%
20	-14.64%	-31.96%	-22.52%	-18.63%
21	-17.07%	-34.63%	-24.35%	-20.48%
22	-21.49%	-37.93%	-25.53%	-20.97%
23	-27.17%	-41.68%	-29.66%	-23.70%
24	-31.22%	-44.75%	-32.00%	-25.05%
25	-33.91%	-45.36%	-34.15%	-24.67%
26	-40.57%	-46.66%	-38.93%	-25.11%
27	-38.22%	-44.86%	-39.30%	-24.20%
28	-39.85%	-47.80%	-39.20%	-25.24%
29	-45.34%	-49.13%	-41.65%	-24.60%
30	-45.48%	-50.38%	-41.42%	-24.63%
31	-49.69%	-53.38%	-44.35%	-26.74%
32	-53.24%	-55.01%	-45.45%	-26.27%
33	-55.11%	-54.63%	-46.30%	-24.76%
34	-57.55%	-57.15%	-46.94%	-25.73%
35	-59.06%	-56.80%	-48.37%	-24.99%
36	-61.70%	-58.47%	-48.53%	-24.46%

Appendix 5: Five years performance using the market model, the CAPM and the Fama and French three factor model

Months	Market model		CAPM		Fama and French	
	BHAR	CAR	BHAR	CAR	BHAR	CAR
1	1.06%	1.06%	0.86%	0.86%	-3.53%	-3.53%
2	4.41%	3.21%	4.41%	3.15%	0.77%	-0.43%
3	5.32%	2.93%	6.24%	3.81%	2.00%	-0.23%
4	6.53%	2.41%	8.02%	3.85%	-0.76%	-4.44%
5	10.63%	3.49%	12.45%	5.14%	1.04%	-5.18%
6	11.53%	2.98%	13.50%	4.85%	1.28%	-6.01%
7	10.29%	2.12%	12.14%	3.87%	-1.86%	-8.34%
8	10.99%	2.00%	12.47%	3.37%	-1.72%	-8.84%
9	10.34%	0.45%	11.13%	1.23%	-3.07%	-11.00%
10	-0.06%	-0.63%	0.57%	0.02%	-14.14%	-12.66%
11	-2.06%	-2.07%	-1.28%	-1.17%	-16.12%	-14.08%
12	-3.77%	-4.59%	-2.58%	-3.34%	-16.58%	-15.57%
13	-7.30%	-9.39%	-6.10%	-8.04%	-19.44%	-19.82%
14	-6.68%	-11.22%	-5.72%	-10.07%	-18.57%	-21.41%
15	-5.91%	-12.91%	-5.63%	-12.55%	-17.08%	-22.49%
16	-4.66%	-14.25%	-5.16%	-14.48%	-15.21%	-23.17%
17	-4.51%	-17.82%	-4.93%	-18.40%	-15.82%	-27.13%
18	-7.08%	-18.80%	-6.92%	-19.14%	-19.01%	-28.33%
19	-10.57%	-21.39%	-10.29%	-21.50%	-23.34%	-31.51%
20	-15.62%	-24.89%	-14.93%	-24.89%	-28.82%	-35.21%
21	-19.83%	-28.61%	-19.05%	-28.05%	-33.41%	-39.00%
22	-24.46%	-31.33%	-24.09%	-30.70%	-33.76%	-38.45%
23	-29.31%	-32.97%	-28.81%	-32.20%	-39.88%	-40.90%
24	-32.19%	-35.65%	-31.58%	-34.96%	-42.66%	-43.27%
25	-37.28%	-37.44%	-36.03%	-36.15%	-44.99%	-42.71%
26	-39.74%	-37.77%	-38.24%	-36.32%	-48.16%	-43.37%
27	-38.16%	-34.36%	-36.70%	-33.21%	-48.13%	-41.06%
28	-40.23%	-36.64%	-39.44%	-35.91%	-49.42%	-42.61%
29	-41.78%	-38.25%	-41.21%	-37.70%	-48.41%	-42.20%
30	-42.45%	-38.73%	-41.69%	-38.21%	-50.37%	-43.55%
31	-45.72%	-41.64%	-45.05%	-41.29%	-54.46%	-46.86%
32	-49.42%	-42.08%	-48.87%	-41.88%	-56.04%	-45.59%
33	-51.78%	-43.32%	-50.84%	-42.88%	-60.10%	-47.92%
34	-52.55%	-45.29%	-51.31%	-44.34%	-58.02%	-47.75%
35	-54.22%	-45.34%	-53.05%	-44.41%	-60.08%	-47.93%
36	-56.33%	-46.75%	-55.20%	-45.89%	-62.22%	-49.25%
37	-59.86%	-48.58%	-58.25%	-47.27%	-66.62%	-51.49%
38	-60.13%	-47.99%	-59.03%	-47.03%	-66.98%	-50.90%
39	-61.67%	-45.84%	-61.24%	-45.12%	-69.18%	-49.06%
40	-65.10%	-47.98%	-64.58%	-47.10%	-71.78%	-50.55%
41	-66.45%	-47.65%	-66.70%	-47.01%	-74.12%	-50.73%
42	-69.69%	-50.81%	-69.83%	-50.12%	-77.25%	-53.66%
43	-67.34%	-48.41%	-68.32%	-48.37%	-77.57%	-52.80%

44	-66.45%	-30.64%	-67.94%	-30.92%	-99.58%	-49.31%
45	-64.42%	-28.42%	-65.96%	-28.96%	-103.31%	-50.14%
46	-62.00%	-29.28%	-63.39%	-29.66%	-102.50%	-51.78%
47	-62.81%	-28.12%	-64.49%	-28.62%	-107.37%	-52.49%
48	-64.02%	-28.80%	-66.17%	-29.56%	-107.23%	-52.27%
49	-65.74%	-25.13%	-67.73%	-25.82%	-105.03%	-46.14%
50	-65.72%	-24.84%	-68.13%	-25.91%	-106.43%	-46.35%
51	-65.30%	-23.74%	-68.04%	-25.24%	-105.64%	-44.89%
52	-63.92%	-16.27%	-66.68%	-17.42%	-120.06%	-45.34%
53	-64.40%	-9.33%	-67.43%	-10.63%	-136.35%	-45.68%
54	-62.69%	-8.87%	-64.75%	-9.59%	-138.67%	-46.75%
55	-61.78%	-9.36%	-64.02%	-10.06%	-139.10%	-47.67%
56	-61.52%	-6.22%	-64.11%	-6.92%	-145.16%	-47.07%
57	-60.58%	-5.76%	-63.00%	-6.40%	-142.05%	-45.37%
58	-61.54%	-6.14%	-63.92%	-6.37%	-147.61%	-47.41%
59	-61.57%	-6.70%	-63.29%	-6.71%	-152.08%	-49.09%
60	-64.37%	-7.77%	-65.86%	-7.63%	-160.66%	-51.94%

Appendix 6: Ten years performance using the market model, the CAPM and the Fama and French three factor model

	Market model		CAPM		Fama and French	
Months	BHAR	CAR	BHAR	CAR	BHAR	CAR
1	-3.81%	-3.81%	-3.98%	-3.98%	-7.53%	-7.53%
2	-2.45%	-1.96%	-2.60%	-2.17%	-1.55%	-1.09%
3	0.56%	-0.70%	1.35%	0.17%	3.44%	2.36%
4	6.01%	-1.16%	7.56%	0.48%	8.46%	1.43%
5	18.23%	1.35%	20.37%	3.35%	22.23%	6.01%
6	22.36%	2.14%	24.63%	4.47%	23.75%	4.90%
7	20.72%	2.72%	23.48%	5.54%	21.45%	5.09%
8	25.64%	5.52%	28.69%	8.38%	23.39%	5.58%
9	28.69%	4.50%	31.42%	6.89%	24.54%	3.13%
10	-5.39%	-4.32%	-2.65%	-1.77%	-4.69%	-3.06%
11	-6.24%	-6.82%	-2.85%	-3.57%	-2.50%	-2.34%
12	-5.33%	-7.63%	-1.62%	-3.81%	-0.69%	-1.76%
13	-9.34%	-12.10%	-4.95%	-7.83%	-0.58%	-3.41%
14	-6.83%	-15.96%	-1.63%	-11.01%	4.45%	-4.52%
15	-0.42%	-14.12%	4.57%	-9.14%	8.94%	-2.88%
16	4.54%	-14.46%	8.43%	-10.29%	16.39%	0.49%
17	4.73%	-17.67%	8.26%	-13.53%	17.34%	-1.19%
18	-2.66%	-18.07%	0.59%	-14.30%	8.57%	-3.79%
19	-8.28%	-16.76%	-5.20%	-13.18%	2.36%	-3.96%
20	-12.89%	-22.51%	-9.12%	-18.77%	-1.72%	-9.90%
21	-20.02%	-26.97%	-15.87%	-23.14%	-6.29%	-13.03%
22	-24.16%	-28.56%	-20.22%	-24.59%	-8.94%	-14.02%
23	-27.80%	-30.17%	-23.41%	-25.56%	-10.78%	-14.43%
24	-31.43%	-34.25%	-26.92%	-29.48%	-13.01%	-17.83%
25	-41.80%	-37.98%	-36.90%	-32.31%	-19.41%	-19.93%

26	-40.71%	-39.87%	-34.93%	-33.93%	-17.51%	-20.96%
27	-36.98%	-40.86%	-31.76%	-35.86%	-16.43%	-23.82%
28	-42.42%	-41.64%	-38.10%	-36.57%	-22.22%	-26.63%
29	-43.39%	-44.88%	-40.15%	-40.17%	-22.56%	-29.65%
30	-46.43%	-47.13%	-42.60%	-42.09%	-24.55%	-31.64%
31	-43.64%	-47.22%	-40.24%	-42.98%	-22.33%	-31.93%
32	-47.35%	-46.55%	-45.09%	-43.09%	-24.59%	-30.92%
33	-50.27%	-49.77%	-47.93%	-46.28%	-25.82%	-33.12%
34	-48.26%	-44.70%	-45.66%	-40.98%	-23.47%	-27.20%
35	-49.96%	-48.20%	-46.89%	-44.21%	-22.60%	-28.54%
36	-50.66%	-49.36%	-46.66%	-44.93%	-22.65%	-29.54%
37	-55.52%	-52.35%	-49.44%	-46.83%	-23.40%	-30.31%
38	-55.30%	-52.92%	-48.41%	-47.29%	-22.71%	-31.11%
39	-57.32%	-48.77%	-50.27%	-42.76%	-20.10%	-23.13%
40	-59.73%	-49.62%	-52.94%	-43.93%	-20.65%	-22.90%
41	-60.35%	-49.83%	-53.61%	-44.79%	-22.23%	-24.96%
42	-64.83%	-53.91%	-58.56%	-49.11%	-24.11%	-28.08%
43	-58.16%	-48.26%	-53.48%	-43.72%	-22.18%	-24.93%
44	-55.65%	-46.05%	-51.94%	-41.79%	-36.03%	-40.08%
45	-50.49%	-41.55%	-47.95%	-37.81%	-36.83%	-39.60%
46	-45.25%	-41.95%	-42.84%	-38.16%	-36.15%	-42.55%
47	-46.49%	-37.68%	-44.85%	-34.44%	-39.99%	-41.24%
48	-44.02%	-35.20%	-42.90%	-32.44%	-38.61%	-38.92%
49	-46.00%	-28.39%	-44.76%	-25.87%	-31.53%	-24.39%
50	-41.96%	-27.82%	-41.93%	-25.67%	-31.68%	-26.54%
51	-40.28%	-23.64%	-40.59%	-21.80%	-33.99%	-25.71%
52	-33.17%	-17.03%	-34.06%	-15.48%	-41.36%	-30.15%
53	-32.63%	-6.31%	-33.75%	-4.93%	-53.95%	-30.52%
54	-29.25%	-4.08%	-29.61%	-2.18%	-54.27%	-29.87%
55	-27.21%	-5.73%	-27.55%	-3.24%	-54.57%	-33.02%
56	-28.20%	-1.04%	-27.92%	1.70%	-56.87%	-29.66%
57	-24.39%	-1.40%	-22.96%	1.70%	-49.52%	-26.40%
58	-23.34%	1.08%	-20.99%	4.93%	-50.55%	-25.39%
59	-21.10%	3.14%	-18.18%	7.55%	-53.05%	-25.65%
60	-26.41%	4.25%	-22.89%	9.23%	-55.95%	-24.39%
61	-30.81%	6.45%	-26.58%	12.41%	-53.85%	-18.45%
62	-29.59%	14.92%	-25.18%	20.85%	-60.15%	-15.45%
63	-27.62%	25.12%	-22.95%	30.90%	-68.92%	-12.49%
64	-28.92%	41.20%	-24.94%	46.07%	-79.46%	-3.10%
65	-30.56%	42.29%	-26.42%	47.30%	-80.87%	-2.03%
66	-27.39%	44.24%	-22.40%	49.52%	-78.16%	1.30%
67	-27.11%	47.03%	-22.56%	52.30%	-77.47%	4.45%
68	-21.10%	52.52%	-14.92%	58.60%	-80.35%	6.52%
69	-24.77%	53.75%	-16.86%	60.64%	-82.25%	8.00%
70	-35.32%	53.54%	-27.32%	60.77%	-86.73%	8.27%
71	-35.25%	56.43%	-26.21%	64.39%	-86.31%	11.37%
72	-35.53%	59.32%	-25.09%	68.00%	-86.72%	14.36%
73	-38.39%	60.83%	-26.64%	70.03%	-83.86%	19.24%

74	-48.52%	65.81%	-36.50%	74.86%	-88.56%	24.42%
75	-56.70%	64.45%	-44.22%	73.69%	-91.25%	24.10%
76	-56.17%	70.43%	-43.37%	79.96%	-91.82%	29.12%
77	-57.39%	72.67%	-44.93%	82.17%	-91.48%	32.15%
78	-54.71%	76.26%	-40.40%	87.10%	-90.72%	35.71%
79	-52.03%	78.06%	-36.25%	89.60%	-92.79%	35.24%
80	-59.05%	79.33%	-41.57%	91.54%	-92.14%	39.45%
81	-69.45%	84.51%	-50.19%	96.87%	-94.64%	46.48%
82	-78.95%	81.28%	-56.99%	94.67%	-96.15%	44.85%
83	-83.28%	83.50%	-58.66%	97.41%	-101.28%	45.44%
84	-85.51%	86.51%	-58.85%	100.92%	-92.52%	54.62%
85	-82.27%	86.78%	-53.36%	102.09%	-92.40%	55.76%
86	-80.99%	86.85%	-51.06%	102.33%	-88.83%	58.61%
87	-86.25%	85.94%	-54.23%	102.23%	-88.92%	60.10%
88	-88.71%	88.09%	-55.71%	104.39%	-88.16%	63.30%
89	-86.73%	87.98%	-53.42%	104.06%	-87.35%	63.86%
90	-85.12%	88.35%	-50.96%	104.86%	-86.62%	66.08%
91	-77.41%	94.93%	-44.07%	110.75%	-65.99%	79.45%
92	-77.19%	97.51%	-41.12%	114.13%	-64.05%	82.86%
93	-75.59%	100.13%	-38.76%	117.14%	-67.65%	84.64%
94	-74.02%	100.68%	-35.55%	118.15%	-125.93%	30.70%
95	-82.36%	97.18%	-35.64%	118.31%	-149.22%	30.86%
96	-76.99%	100.86%	-28.15%	122.01%	-152.42%	34.32%
97	-76.06%	102.03%	-26.23%	123.05%	-155.53%	34.88%
98	-81.92%	103.17%	-30.88%	124.53%	-157.46%	36.61%
99	-81.07%	107.21%	-29.45%	128.60%	-163.29%	38.70%
100	-68.95%	113.23%	-15.07%	134.74%	-162.24%	44.82%
101	-67.58%	113.69%	-11.98%	135.43%	-157.68%	47.29%
102	-66.50%	115.30%	-9.87%	136.66%	-165.86%	45.81%
103	-59.80%	114.26%	-4.57%	135.18%	-160.20%	47.17%
104	-64.42%	113.15%	-10.08%	134.54%	-164.91%	45.10%
105	-60.57%	112.97%	-5.93%	134.16%	-162.85%	46.15%
106	-50.62%	115.37%	2.09%	135.59%	-164.02%	47.52%
107	-53.84%	114.23%	1.70%	134.38%	-164.43%	46.91%
108	-63.59%	120.64%	-8.42%	140.35%	-192.51%	42.50%
109	-53.85%	121.04%	1.61%	140.65%	-200.49%	39.71%
110	-45.11%	122.60%	11.06%	142.37%	-203.59%	39.56%
111	-45.50%	119.67%	11.17%	139.33%	-207.57%	35.26%
112	-59.52%	120.06%	-1.14%	139.67%	-213.27%	35.37%
113	-70.15%	121.75%	-12.36%	141.10%	-217.41%	36.07%
114	-61.57%	122.10%	-7.74%	140.41%	-218.62%	35.14%
115	-46.82%	120.45%	3.48%	137.88%	-216.12%	32.31%
116	-51.46%	120.18%	-5.84%	136.44%	-213.85%	32.25%
117	-47.08%	121.17%	-5.18%	136.79%	-210.91%	33.85%
118	-43.80%	120.61%	-8.25%	135.23%	-217.07%	30.03%
119	-37.09%	118.35%	-5.67%	132.61%	-211.31%	28.59%
120	-25.43%	116.23%	4.62%	130.33%	-209.62%	26.06%

Appendix 7: Editor's Letter

28 June 2013

To Whom It May Concern

This is to certify that I have manually edited the thesis titled "Returns on initial public offerings (IPOs) on the Johannesburg Securities Exchange (JSE): Success and failure patterns" by Neneh Brownhilder Ngek for language usage, grammar, spelling and punctuation. She effected the changes herself. In this way every effort was made to ensure that neither the research content nor the candidates' ownership of her text was altered.

Sincerely

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Appendix 8: Plagiarism Report - Turnitin

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RESEARCH OUTPUT

Underpricing and long-run performance of initial public offers (IPOS): evidence from South Africa

Neneh, B.N. & Smit, A.V.A.

ABSTRACT

This study provides evidence on both the underpricing and long-run performance of IPOs listed on the Johannesburg Security Exchange (JSE). The selected factors that influence the performance of IPOs (the market period (hot and cold); the grouped industry; the size of the IPO and initial first day performance) were examined to determine if these factors could help identify trends in the long run performance of the IPOs. Using a sample of 290 companies listed from the period of 1996 - 2009, this study established that IPOs in the JSE are initially underpriced and underperform the market in the long run. Both the level of underpricing and long run underperformance vary within the groups of the selected factors. It is observed that the level of underperformance is relatively higher for underpriced IPOs and for IPOs that close at the offer price than overpriced IPOs. Also observed is the fact that as the size (offer price) increases above the median for any given period, the level of underpricing drastically decreases while their aftermarket performance is poor (negative). Hot period IPOs were also found to have a higher level of underpricing compared to cold issue IPOs and their long run performance was worse than that of cold period IPOs. Furthermore, using the analysis of variance, it was established that IPOs in the financial and technology sectors were highly underpriced compared to the mining and other sectors but found no significant difference in the long run performance between IPOs in all these sectors. It can thus be suggested that investors should consider the emergent pattern for IPO performance in both hot and cold markets and their offer prices relative to that of other firms listed in the same period when making investment decisions.

Key Words: IPO, underpricing, long run performance

1. INTRODUCTION

Two of the most important anomalies of the IPO market are IPO underpricing and long-run underperformance. These abnormalities have been acknowledged in almost all financial markets around the world (Jenkinson and Ljungqvist, 1996) and the degree of occurrence varies across different markets, regardless of the time period investigated. There is extensive international empirical evidence consistently indicating that IPOs that have large positive initial returns, especially on the first day, tend to either underperform the market in the long run or even have negative abnormal returns (Ritter and Welch, 2002; Álvarez and González, 2005; Akhigbe, Johnson and Madura, 2006; Mazouz, Saadouni, and Yin, 2008). Loughran, Ritter, and Rydqvist (2006) collected results from studies in France and Switzerland for a period of 1983-2000 and observed that IPOs in France had an initial return of 11.6% and underperformed the market in the long run by -4.8%, while IPOs in Switzerland had an initial return of 34.9% and underperformed the market in the long run by -6.11%. In contrast, the findings of Thomadakis, Nounis and Gounopoulos (2006) in Greece for the period of 1994-2002 observed a short term return of 42.12% and in the long run outperformed the market by 92.93%. These findings imply that although most IPO investors earn positive initial returns on the first day; their long run returns either diminish or increase.

In South Africa, numerous studies have been carried out on the JSE in order to document what happens with IPOs in the short and long run. For example a study on IPO short run performance by Van Heerden and Alagidede (2012) using data for 138 South African IPOs that were listed on the JSE from 2006 to 2010, found significant short run underpricing and that the financial sector had the largest IPO underpricing in 2007. Govindasamy (2010) looked at long run performance of IPOs between 1995 and 2006. Using the Buy and Hold Abnormal Return (BHAR) and Cumulative Abnormal Return (CAR) methods, he showed that the IPOs underperformed the market by 50% and 47% for BHAR and CAR respectively and that they were significant differences across sectors. Mangozhe (2010) examined the long-run investment performance of IPOs during the period 1992 to 2007 and found that there was no evidence of abnormal performance, but that IPO performance depended on the market conditions, as in periods of market buoyancy, IPOs performed well and in periods of market distress, IPO performance suffered. While these studies provide significant information on underpricing and long run performance of IPOs on the JSE, there is still a high need for more studies to document this market trend using a wider period as well as using the same sample to examine the underpricing and long run performance. Using data from the JSE over a period of 1996 to 2009, this study documents the trends in IPO initial and long run performance on the JSE based on four distinct factors namely: the market period

in which the IPO was listed (hot and cold); the grouped industry in which the IPO is listed (Mining, Financial, Technology and Other); the size of the IPO (based on offer price); and initial first day performance. We examine if these factors could help predict trends in the long run performance of the IPOs.

2. LITERATURE REVIEW

2.1 Characteristics of firms in relation to the short and long run performance

2.1.1 Size

The size (offer price) characteristics have been recognized widely as important determinants of stock returns. For example, Kooli and Suret (2002) found that underpricing decreases with the size of the issue with small IPOs usually more underpriced than larger IPOs. Kumar, (2004) reported that the size of the issue had an inverse relationship signifying that an increase in issues size reduces underpricing. Drobetz, Kammerman and Wälchli (2005) found that the underperformance was due to the size of the firms. Goergen, Khurshed, & Mudambi (2007) also established from his study of IPOs in the UK that small firms suffered from a greater level of initial underperformance than larger firms did. Furthermore, Ibbotson, Sindelar and Ritter (1994) establish that the average initial return on US IPOs with an offering price of $3.00 or more was 8.6%, while the average initial return on IPOs with an offering price of less than $3.00 was 42.8%, thus showing that underpricing is considerably larger on smaller offerings. M'kombe and Ward (2002) found that South African IPOs with an offer price below 99 cents showed the highest initial returns. Likewise, Van Heerden and Alagidede (2012) witnessed that the shares priced below 500 cents on South African IPOs were clearly severely underpriced compared to shares priced above 500 cents. Conversely, Deb and Vijaya (2010) reported that the issue size had a negative impact on the level of underpricing; suggesting that a large issue size increases the supply of IPO shares, and thus results to lesser underpricing. Cai, Liu and Mase (2008) observed that the larger the offer size of IPOs, the worse the long run performance was.

2.1.2 Industry sectors

Several studies have investigated if the performance or returns from one sector or industry differed from the returns of IPOs from other sectors or industries. For example, Kiymaz (2000) studied IPOs listed on the Istanbul Stock Exchange between the period 1990 and 1996 and observed differences in initial returns and after market returns between the different

sectors, with the initial returns for financial sector being higher than that of industrial sectors. How (2000) observed that IPOs in the mining sector in Australia exhibited a difference in their long run performance from those in the industrial sector. Moreover, Finkle and Lamb (2002) compared the long run aftermarket performance of IPOs in emerging industries (biotechnology, semiconductor and internet IPOs) to those in non-emerging industries during the period between 1993 and 1996. This study found that the returns from emerging industry IPOs after a year were worse than that of non-emerging industry IPOs and that the performance for both industries was negative. Contrary to the results of Finkle and Lamb (2002), Ang and Boyer (2009), observed that IPOs in new industries tend to declare bankruptcy less often and became delisted less often than companies conducting an IPO in established industries.

2.1.3 Hot and cold issues

It is well documented that IPO markets follow cyclical patterns with dramatic swings, often called hot and cold markets (Ibbotson and Jaffe, 1975; Helwege and Liang, 2002). The hot market issue is defined by periods of rising initial returns and increasing numbers of IPOs (Doeswij, Hemmes and Venekamp, 2006). Prior research (Aggarwal, 2006; Altl, 2005) have shown that the hot IPO markets are characterized by extremely high initial returns, an unusually high volume of offerings, severe underpricing, frequent oversubscription of offerings, prevalence of smaller issues, and, to a certain extent, by concentrations in particular industries. In contrast, cold IPO markets have less underpricing, lower issuance, fewer instances of oversubscription, and larger offerings (Helwege and Liang, 2002). Ibbotson and Jaffe (1975) and Ritter (1984) who pioneered the hot markets concept acknowledged the existence of underpricing (high IPO volume) in hot periods where subsequent underperformance tends to be more dramatic. Lawson and Ward (1998:17) found that in South Africa, the initial returns in hot periods were significantly greater than initial returns in cold periods and thus concluded that the aftermarket performance of shares was significantly different for hot and cold periods on the JSE. Helwege and Liang (2004) documented that both hot and neutral market IPOs tend to underperform while cold market IPOs tend to outperform a variety of benchmarks. Likewise, Yung, Colak, and Wang (2006) on their study established that the distributions of IPO returns in hot and cold periods were substantially different. They observed that long-run abnormal returns increases substantially during hot IPO markets and with most hot IPOs had the tendency of being delisted within the

first few years after listing. Cook et al. (2003) established that the performance of IPOs during hot markets was worse than IPOs during cold markets.

3. METHODOLOGY

3.1 Sample and data collection methods

The population for the study comprises of a sample of 290 IPOs that were listed on the JSE during a period of 1996 to 2009. The information was sourced from McGregor-BFA database, where information regarding the offering price, closing day prices, number of shares and, prospectus of IPO companies were collected. The JSE All Share Index (ALSI) was used as the broad benchmark to assess the abnormal returns from these listings. This study also classified the industries into four main sectors (mining, financial, technology and others) as used by Govindasamy (2010) and, Van Heerden, and Alagidede (2012) in their studies on the JSE.

3.1.2 Measurement Techniques

3.1.2.1 Underpricing

There are a number of methods available for calculating underpricing. For comparative purposes, this study will adopt the mean market-adjusted abnormal return, which is the standard method for calculating underpricing of new issues

The mean market-adjusted abnormal return is calculated as follows

$$R_{x,i} = \frac{P_{x,i} - P_{x,0}}{P_{x,0}}$$

Where $R_{x,i}$ = return on stock 'x' at the end of the ith trading period.

$P_{x,i}$ = price of stock 'x' at the end of the ith trading period and

$P_{x,0}$ = offer price of stock 'x'.

i = represents either the first trading day, the first trading week or the first trading month

The average raw return is calculated as

$$\bar{R}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} R_{x,i}$$

Where $\bar{R}_{x,i}$= the sum of the returns on the sample IPOs divided by the number of sample IPOs.

The JSE All Share Index (J203) is used as the benchmark and is calculated as:

$$R_{m,i} = \frac{J_{m,i} - J_{m,0}}{J_{m,0}}$$

Where $R_{m,i}$ = market return at the close of day i trading period

$J_{m,i}$= the market index value at the end of the i trading period

$J_{m,0}$ = the market index value on the offer day of stock x.

The market-adjusted abnormal return ($MAAR_{x,i}$) for stock 'x' after i[th], trading period is calculated as follows:

$$MAAR_{x,i} = 100 \times \left\{ \frac{(1 + R_{x,i})}{(1 + R_{m,i})} - 1 \right\}$$

The market-adjusted model measures the initial trading returns in excess of market return. This measurement has been widely used in earlier studies on the short run performance of IPOs by economists such as Aggarwal et al. (1993) on Latin American IPOs and by Sadaqat et al. (2011) on their Pakistani IPOs.

The average market-adjusted abnormal return for the ith trading period is.

$$\overline{MAAR}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} MAAR_{x,i}$$

Where $\overline{MAAR}_{x,i}$= the sum of the market adjusted abnormal return of the sample IPOs divided by the number of sample IPOs.

3.1.2.2 Long run performance

We calculated IPO long run performance using the Cumulative Abnormal Return (CAR) and the Buy and Hold Abnormal Return (BHAR), over 36 months after the IPO. For firm delisted

within the 36 month test period, these listings were not included in the sample. For the cumulative abnormal returns, the return on a security or index is defined as:

$$r_{i,t} = \left(\frac{P_{i,t}}{P_{i,t-1}}\right) - 1$$

Where $P_{i,t}$ is the price of the security at the end of the current period and $P_{i,t-1}$ is the price of the security at the end of the previous period (Suherman and Buchdadi, 2011).

The benchmark-adjusted return for stock i in event month t is defined as:

$$ar_{i,t} = r_{i,t} - r_{m,t}$$

Where $R_{i,t}$ is the return for firm i in period t and $R_{m,t}$ is the return on a benchmark (JSE All Share Index) for the same period.

The average adjusted return for a portfolio of n stocks in period t is the mean of the benchmark-adjusted returns, which is given as:

$$AR_t = \frac{1}{N}\sum_{i=1}^{n} ar_{i,t}$$

The cumulative adjusted return during the 36-month aftermarket period is therefore the sum of the average adjusted returns for each period

$$CAR_t = \sum_{s=1}^{t} AR_s$$

As an alternative to the use of CAR, we also used the buy-and-hold to compute three-year holding period returns. The BHAR is the return on a buy-and-hold investment in the sample firm less the return on a buy-and-hold investment in the control firm for T periods (following a three years aftermarket performance). For each firm i stock, the long-term returns in the aftermarket is calculated from the first trading month to the month where the stock celebrated its third anniversary.

The holding period return (BHR) for a firm i stock is calculated for the period T as

$$BHR_{i,T} = \left[\left(1 + R_{i,1}\right)\left(1 + iR_{i,2}\right) \dots \dots \dots \dots \left(1 + R_{i,t}\right)\right] - 1$$

This formula can be rewritten as;

$$BHR_{i,T} = \left[\prod_{t=1}^{T}(1 + R_{i,t})\right] - 1$$

Where $R_{i,t}$ is the raw return of firm i stock at time t and T is the time period for which the BHR is calculated.

In order to calculate the BHAR on firm i over T period, the return of the firm ($R_{i,t}$) is subtracted from the return of the market ($R_{m,t}$), which can be calculated as follows:

$$\text{BHAR}_i = \frac{1}{N} \sum_{t=1}^{N} \left[\left(\prod_{t=1}^{T} (1 + R_{i,t}) \right) - \left(\prod_{t=1}^{T} (1 + R_{m,t}) \right) \right]$$

4. RESULTS AND DISCUSSION

Table 1: Market adjusted abnormal return for the period 1996-2009

Return	N	Raw Return	Avg. Market Returns (%)	Market Adj. Abnormal Return (%)	Std. Dev.	T - Statistics
All sample first day return	290	72.7%	-0.06%	72.3%	385.7	3.2121*

*Significant at 1%

From Table 1, it is established that IPOs on the JSE are underpriced with an average market-adjusted returns of 72.3% for the first day and the result is significant at the 1% level. Van Heerden and Alagidede (2012) using data for 138 South African IPOs listed on the JSE from 2006 to 2010, found significant short run underpricing on the JSE, with an average market-adjusted return for the first trading day of 108.33%. Higher levels of underpricing compared to that of the JSE were also established in other stock markets such as Malaysia (96.6%) for the period 1980-2006 and India (92.7%) for the period 1990 to 2007 (Loughran, Ritter, and Rydqvist, 2010).
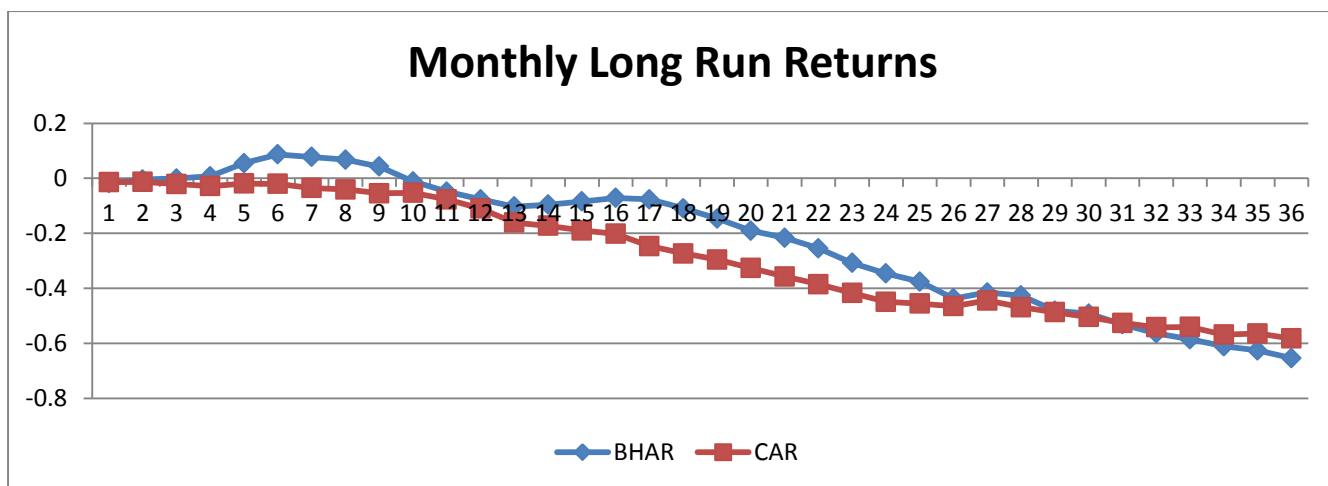
Figure 1: **Descriptive statistics of the monthly BHAR and CAR for a 3 years aftermarket performance for aperiod 1996-2009**

The results in Figure 1 show that the monthly BHAR and CAR for a 3 years aftermarket performance differ as a result of differences in the methods used. From the graph it is observed that IPOs on the JSE underperform the market by 7.6% for the first year, 34.6% for the second year and 65.4 % for the third year when using the BHAR. While when using the CAR, IPOs underperform the market by 10.97% for the first year, 44.9% for the second year and 58.2% for the third year. These findings are consistent with other studies by Govindasamy (2010) which showed that the IPOs underperformed the market by 50% and 47% for BHAR and CAR respectively on the JSE. However, other studies by Mangozhe (2010) found no evidence of abnormal performance on the JSE for a period 1992 to 2007 using the Fama and French (1993) three-factor model.

Table 2: Long run IPO performance based on their initial first day performance

	N	BHAR (%)			CAR (%)		
		Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Underpriced IPOs	195	-4.6	-41.5	-76.6	-10.9	-52.9	-70.7
Overpriced IPOs	71	-9.2	-12.6	-33.6	-3.4	-22.7	-27.0
IPOs that Close at the Offering price	24	-27.9	-44.3	-68.7	-33.9	-46.5	-51.5

From Table 2, it is observed that 195 IPOs were underpriced on the first day, 71 were overpriced and 24 closed on the first day at the offer price. Also observed is the fact that

from all the IPOs that were either underpriced, overpriced or closed at the offering price on their first day of trading, all underformed the market in the long run. Furthermore, the level of underperformance is relatively higher for underpriced IPOs and for IPOs that close at the offer price than overpriced IPOs. These findings go to show that IPOs that are highly underpriced in the short run have very disappointing results in the long run. This is consistent with previous views (Ritter and Welch, 2002) that found that IPOs with high first day performance tend to disappoint the most in the long run. The level of long run underperformance on the JSE is considerable higher than some developed countries like France with an initial return of 11.6% and underperformed the market in the long run by -4.8% (Loughran, Ritter, and Rydqvist, 2006). With regards to underpriced, overpriced and IPOs that closed at the offering price, Ritter (1998) established that one in eleven IPOs had a negative initial return, one in six closed on the first day at the offer price and one in a hundred doubled on the first day.

In order to find out if there is a significant difference between the long run performance of IPOs and initial first day performance, an Anova analysis was performed.

Table 3: ANOVA: Performance by initial first day performance

		Sum of Squares	df	Mean Square	F	Significance
Long run Perform ance	Between groups	0.61	2	0.31	2.48	0.09
	Within Groups	35.31	287	0.12		
	Total	35.92	289			

The ANOVA results from Table 3 (F=2.48, p=0.09) show that there is no significant difference in the long run performance of IPOs based on their initial first day returns.

Table 4: Initial and long run performance based on IPO issue size (offer price)

Offer Price	N	Initial first day Performance (%)	BHAR (%)			CAR (%)		
			Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
≤ Median	163	118.90	-1.0	-32.1	-79.9	-7.3	-47.8	-63.8
>Median	127	13.53	-16.3	-37.8	-46.9	-15.7	-41.4	-51.4

The results from Table 4 show the initial first day and long run performance of IPOs based on the offer price. The median was chosen as the best measure of central tendency due to the existence of numerous outliers in the IPO offer price. The median is used to determine how the level of initial first day performance and long run performance is affected by the offer price. The calculated median for the sample was 200 cents. The results indicate that IPOs with an offer price less than or equal to the median had very high initial returns (118.90) and very poor long run performance, when using both the BHAR and CAR methodology, while IPOs above the median had a relatively low level of initial returns (13.53) but also underperform the market in the long run. However, the long run performance for the IPOs priced above the median price is lower than IPOs priced below the median. This is in line with a prior study by Deb and Vijaya (2010) which reported that a large issue size increases the supply of IPO shares, and thus results to lesser underpricing. Contrary to the findings of this study, Cai, Liu, and Mase (2008) observed that IPO performance worsen with increase in offer size of IPOs.

Table 5: ANOVA: Performance by Offer Price

		Sum of Squares	df	Mean Square	F	Significance
Long run Performance	Between groups	1.04	1	1.04	8.57	0.00
	Within Groups	34.88	288	0.12		
	Total	35.92	289			

The Anova results in Table 5 (F=8.57; p=0.00) show that there is a significant difference in the long run performance between IPO priced above the median offer price and IPO with an offer price less than or equal to the median price.

Table 6: Initial and long run performance based on hot and cold markets

	N	Initial first day Performance	BHAR (%)			CAR (%)		
			Year 1	Year 2	Year 3	Year 1	Year 2	Year 3

Hot market	212	97.53	-12.0	-50.4	-90.4	-12.0	-56.9	-76.6
Cold market	78	5.44	4.1	8.2	2.6	-8.1	-12.7	-8.8

From Table 6, it becomes evident that IPOs in the hot market period have very high initial first day returns and very poor long run performance comparatively to IPOs issued in the cold market periods. This finding is in line with a study by Lawson and Ward (1998:17), which found that the initial returns in hot periods were significantly greater than initial returns in cold periods on the JSE and that the aftermarket performance of shares was significantly different for hot and cold periods on the JSE. Helwege and Liang (2004) also highlighted in their study that hot issue IPOs resulted in poor long run performance.

In order to find out if there is a significant difference in the long run performance of IPOs in the hot and cold markets, an Anova analysis was performed.

Table 7 – ANOVA: Long run Performance by Market Period

		Sum of Squares	df	Mean Square	F	Significance
Long run Performance	Between groups	4.32	1	4.32	39.42	0.00
	Within Groups	31.59	288	0.11		
	Total	35.92	289			

The results from Table 7 show that there is a significant difference in the long run performance of IPOs based on their market period (F=39.42; p<0.001). The significant difference in the long run performance between hot and cold market IPOs clearly supports the views from existing studies that hot market IPOs performed worse in the long run than their cold market counterparts.

Table 8: Initial and long run performance based on industries

Industrial Sector	N	Initial first day Performance	BHAR (%)			CAR (%)		
			Year 1	Year 2	Year 3	Year 1	Year 2	Year 3
Mining	38	31.62	-2.8	-34.4	-50.8	16.7	-41.1	-33.0

Financial	51	**175.14**	-18.2	-37.2	**-79.4**	-25.0	-51.9	**-47.1**
Technology	55	**98.18**	-6.3	-45.0	**-101.4**	4.9	-44.9	**-78.9**
Other	146	38.12	-5.8	-29.9	-50.8	-10.5	-43.6	-61.2

The results in Table 8 depict that on average, IPOs in the financial sector (175.14) and technology sector (98.18) have a high initial return and a very poor long run performance when compared to IPOs in the mining and other sectors. The long run performance results for the financial sector and technology are similar to the findings of Govindasamy (2010) on the JSE using as sample of 58 financial sector IPOs and 41 technology companies. Using the 3 year BHAR, he established that IPOs in the financial sector had a BHAR of -81.8% while technology IPOs had a BHAR of -113.2%. However, using 21 mining companies, he obtained a BHAR of 75.7% which is considerably different from the results of this study although the results were not statistically significant. Having a negative BHAR return for mining companies is not uncommon as How (2000) in her study on Australian mining IPOs obtained a 3 year BHAR of -36% and a CAR of -20%.

Table 9: ANOVA: Performance by Industry

		Sum of Squares	df	Mean Square	F	Significance
Long run Perform ance	Between groups	0.19	3	0.06	0.51	0.68
	Within Groups	35.73	286	0.12		
	Total	35.92	289			

The ANOVA results in Table 9 (F=0.51; p=0.68) shows that there is no significant difference in the long run performance of IPOs on the JSE based on their industry. This finding is contrary to that of Govindasamy (2010) who identified a significant difference in the long run performance of IPOs in the different sectors of technology, industrials, financials and mining, and other.

CONCLUSION

The empirical findings obtained in this study indicate that IPOs on the JSE are underpriced and underperform the market in the long run, which is consistent with similar findings across

different stock markets. Also, the level of underperformance is relatively higher for underpriced IPOs and for IPOs that close at the offer price than overpriced IPOs. Furthermore, hot period IPOs have a higher level of underpricing compared to cold issue IPOs; however the long run performance of hot period IPOs is worse than that of cold period IPOs. These findings are consistent with prior studies and it can thus be suggested that investors should consider the emergent pattern for IPO performance in both hot and cold markets before choosing which firms to invest in. With regards to the offer price, the results indicate that as the price increases above the median for any given period, the level of underpricing drastically decreases while their aftermarket performance is poor (negative). Furthermore, using the analysis of variance, it was established that there was a significant difference in the long run performance of IPOs based on the market issue period. This study also established that financial and technology sectors where initially highly underpriced compared to the mining and other sectors. However there was no significant difference in the long run performance between IPOs in these sectors. This finding however was contrary to that of Govindasamy (2010). As such further analyses need to be done to provide investors with valuable information regarding the performance of IPOs by industry. It can thus be suggested that investors should consider the emergent pattern for IPO performance in both hot and cold markets and their offer prices relative to that of other firms listed in the same period.

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Underpricing of IPOs during hot and cold market periods on the South African Stock Exchange (JSE)

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ABSTRACT

Underpricing is one anomaly in initial public offerings (IPO) literature that has been widely observed across different stock markets with different trends emerging over different time periods. This study seeks to determine how IPOs on the JSE performed on the first day, first week and first month over the period of 1996-2011. Underpricing trends are documented for both hot and cold market periods in terms of four main sectors (cyclical, defensive, growth stock and interest rate sensitive stocks). Using a sample of 360 listed companies on the JSE, the empirical findings established that IPOs on the JSE are significantly underpriced with an average market adjusted first day return of 62.9%. It is also established that hot market IPOs on the JSE are more underpriced than the cold market IPOs. Also observed is the fact that as the offer price per share increases above the median price for any given period, the level of underpricing decreases substantially. While significant differences exist in the level of underpricing of IPOs in the four different sectors in the hot and cold market periods, interest rates sensitive stocks showed a different trend from the other sectors and thus require further investigation to uncover this pattern.

1. Introduction

"Ref. [1]" define an IPO as "the original sale of a company's securities to the wider public for the first time in the primary market". An IPO offers a fresh source of capital that is vital to the growth of the company and provides the company and existing shareholders a liquid market for their shares. Also, from an investor's perspective, an IPO renders investors an opportunity to share in the rewards of the growth of the company [2]. The transition from a private company to a public company is one of the most important events in the life of a company [3]. "Ref. [4]" highlight that underpricing occurs when the closing price at the end of the first day of trading is higher than the initial offer price, meaning that the value at which the company sold its shares to the public was lower than their actual market value. Underpricing of stocks also takes place with respect to the position of market (i.e. whether the IPO market is hot or cold) and type of industry as evident in a study by [5]. Other studies by [6] and [7] point out that the IPO market usually follows a cycle with dramatic swings, often referred to as hot and cold markets. "Ref. [8]" examined IPO listed in hot-issue and cold-issue periods to determine whether businesses that launched an IPO during these periods were very different in terms of the nature of their business or the newness of their industry. Findings from this study concluded that there are no dramatic differences in a company's characteristics for each market type. Other studies ([9]; [10]) also suggest that the up and down swings in the IPO market reflect changes in investor sentiment, changes in factors that affect the decision to issue equity, such as asymmetric information between investors and the issuing company.

"Ref. [11]" found that in South Africa, two complete hot and cold cycles occurred in the 20 year period from 1975 to 1995 on the JSE, one of which was apparent in the ten-year period from 1986 to 1995. "Ref. [11] further established that the initial returns in hot periods were significantly greater than initial returns in cold periods using a t-test and thus concluded that the aftermarket performance of shares was significantly different for hot and cold periods on the JSE. Likewise [12] in their study also observed that in the period 1972 through 1986, hot issue market cycles occurred at a frequency of approximately 9-10 years each. "Ref. [13]" using data from the period of 1996-1999 demonstrated the emergence of hot issue market during the course of the year 1997 and cooling down during the latter part of the 1999. Moreover, [14] using data for 138 South African IPOs that were listed on the JSE from 2006 to 2010, found significant short run underpricing and that the financial sector had the largest IPO underpricing in 2007. While these studies provide significant information on underpricing on the JSE, there is still a high need for more studies to document this market trend using a wider period of time especially in the post-Apartheid period from the introduction of the JSE all-share index in 1996 as the benchmark for market performance. It is also necessary to identify hot and cold market periods during this time and document the trends in IPO performance in both market types.

The purpose of this study therefore is firstly to determine how IPOs on the JSE performed on the first day, first week and first month, over a period of 1996-2011. Secondly, this study intends to find out how IPOs performed in the hot versus the cold market periods, as well as whether the offer price influences the level of underpricing on the JSE. Lastly, this study groups the IPOs listed on the JSE into four main sectors (cyclical, defensive, growth stock and interest rate), to determine if there are any differences in their performance across these sectors in both hot and cold market periods.

2.1 Theories and Evidence of IPO underpricing across various stock markets

Underpricing is one of the most common phenomena that have been evident in most stock markets around the world and there is a great deal of disparity in underpricing across markets and regions. In the Asian region, [15] reported 145% in China, [16] demonstrated evidence of underpricing for Indonesia (41%), Malaysia (41%), South Korea (44%), Taiwan (13%), and Thailand (26%). Moreover, [17] collected results from various studies in 47 countries around the world on the average first day returns and observed that the highest first day returns were recorded in Jordan (149%) for a sample of IPOs dating from 1999-2008, 96.6% in Malaysia for a sample of IPOs dating from 1980-2006 and 92.7% in India for the sample of IPOs dating from 1990 to 2007.

Furthermore, the Latin American emerging markets have the second highest level of underpricing among the regions. "Ref. [18] reported initial return of 79% in Brazil, 16% in Chile, and 3% in Mexico. "Ref. [16]" found 44% initial returns in Argentina. Additionally, the level of underpricing in European emerging markets shows initial returns of 28% in Greece [16], 13% in Turkey ([19]), 15% in Hungary and 55% in Poland ([20]). In Africa, existing evidence shows very low level of underpricing. For example, [21] established an initial underpricing of 8% in Egypt; [22] reported an initial return of 7% in South Africa. This accentuates that underpricing is one of the most prominent abnormalities that have been acknowledged in almost all financial markets, irrespective of the time period investigated, but the level of underpricing varying across different markets / countries.

2.2 IPO underpricing in the hot and cold market

It is well documented that IPO markets follow cyclical patterns with dramatic swings often called hot and cold markets ([6]; [10]). The hot market issue is defined by periods of rising initial returns and increasing numbers of IPOs ([23]). This situation exists when there is a window of opportunity and IPOs are highly valued and companies take advantage of a buoyant market ([24]). Prior research ([25]; [26]) have shown that the hot IPO markets are characterized by extremely high initial returns and by an extraordinarily high variability of initial returns (there is a strong positive correlation between the mean and the volatility of initial returns over time). "Ref. [9] affirms that hot IPO markets are characterized by an unusually high volume of offerings, severe underpricing, frequent oversubscription of offerings, prevalence of smaller issues, and, to a certain extent, by concentrations in particular industries. In contrast, cold IPO markets have less underpricing, lower issuance, fewer instances of oversubscription, and larger offerings ([10]). Cold markets are usually triggered when certain number of low quality IPO companies is observed and the acceptable offer price is low and fewer businesses are willing to go public.

In explaining how IPOs in hot and cold markets differ [11] found that in South Africa, the initial returns in hot periods were significantly greater than initial returns in cold periods, but the IPOs came from similar industries and had similar characteristics. "Ref. [26]" propounds that the hot versus cold market phenomenon can be attributed to information spill-overs. "Ref. [26] elucidated further by suggesting that many companies do not necessarily go public during 'hot' cycles because of financial reasons at that time, but rather because they want to take advantage of the prevailing market conditions and capitalise on the sentiment by pricing their offers higher. Consistent with this finding is a study by [27] who advocated that companies went public during hot market periods to take advantage of the overpriced IPOs, resulting from the prevailing favourable market conditions.

2.3 Underpricing and the offering price

An extensive body of literature has examined the effect of the offer price on the initial return of IPOs. For example, [28] found that underpricing decreases with the size of the issue and that small IPOs are usually more underpriced than larger IPOs. "Ref. [29]" reported that the size of the issue had an inverse relationship signifying that an increase in issue size reduces underpricing. Furthermore, other studies by [30] observed that smaller IPO were more underpriced than a larger IPO, suggesting that smaller IPOs are riskier than larger IPOs. In addition, [31] established that the average initial return on US IPOs with an offering price of more than $3.00 was 8.6%, while the average initial return on IPOs with an offering price of less than $3.00 was 42.8%, thus showing that underpricing is considerably larger when the offering price is smaller. "Ref. [32]" found that South African IPOs with an offer price below 100 cents showed the highest initial returns. Likewise, [14] witnessed that the shares priced below 500 cents on South Africa IPOs were clearly severely underpriced compared to shares priced above 500 cents. Conversely, [33] reported that the issue size had a negative impact on the level of underpricing; suggesting that a large issue size increases the supply of IPO shares, and thus results to lesser underpricing.

2.4 Underpricing of IPO in different sectors

Several studies have investigated if the performance or returns from one sector or industry differed from the returns of IPOs from other sectors or industries. For example [8] in their studies observed that there is more evidence of industry concentration in cold markets contrary to hot markets. "Ref. [19] studied IPOs listed on the Istanbul Stock Exchange

between the period 1990 and 1996 and observed differences in initial returns and after market returns between the different sectors, with the initial returns for financial sector being higher than that of industrial sectors. Other studies by [34] compared the long run aftermarket performance of IPOs in emerging industries (biotechnology, semiconductor and internet IPOs) to those in non-emerging industries during the period between 1993 and 1996. This study found that the returns from IPOs in emerging markets after a year were worse than that of IPOs in more mature markets. Contrary to the results of [34], [35] observed that IPOs in new industries tend to declared bankruptcy less often and got delisted less often than companies conducting an IPO in established industries.

3. METHODOLOGY

3.1 Sample and data collection methods

The population for the study comprise of all 360 IPOs that have been listed on the JSE during a period of 1996 to 2011. This information was sourced from McGregor-BFA database, where information regarding the offering price, closing day prices, number of shares and prospectus of IPO companies were collected. The JSE All Share Index (ALSI) was used as the broad benchmark to assess the abnormal returns from these listings. This study also classified the industries into four main sectors (growth stocks, cyclical stocks, defensives stocks and interest rate sensitive stocks) to ensure that each of the corresponding benchmarks was made up of enough individual stocks. Businesses in the growth stocks comprised of information related industries (content and processing), such as telecom, media and information technology. Cyclical companies comprised of energy, raw materials, capital goods (excluding information technology), business services and cyclical consumer goods. Defensives companies consisted of defensive consumer goods, pharmaceuticals and utilities. Interest rate companies comprised of sensitive group financials like real estate, banks and insurers. "Ref. [36]" and [23] also used categorization into cyclical, defensives, growth stocks and financials.

3.2 Measurement Techniques

There are a number of methods available for calculating underpricing. For comparative purposes, this study will adopt the mean market-adjusted abnormal return, which is the standard method for calculating underpricing of new issues.

The mean market-adjusted abnormal return (MAAR) is calculated as follows:

$$R_{x,i} = \frac{P_{x,i} - P_{x,0}}{P_{x,0}}$$

Where $R_{x,i}$ = return on stock 'x' at the end of the ith trading period.
$P_{x,i}$ = price of stock 'x' at the end of the ith trading period, and
$P_{x,0}$= offer price of stock 'x'.
i = represents either the first trading day, the first trading week or the first trading month.

The average raw return is calculated as follows:

$$\bar{R}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} R_{x,i}$$

Where $\bar{R}_{x,i}$ = the sum of the returns on the sample IPOs divided by the number of sample IPOs.

The JSE All Share Index (J203) is used as the benchmark and is calculated as:

$$R_{m,i} = \frac{J_{m,i} - J_{m,0}}{J_{m,0}}$$

Where $R_{m,i}$ = market return at the close of day i trading period.
$J_{m,i}$ = the market index value at the end of the i trading period.
$J_{m,0}$ = the market index value on the offer day of stock x.

The market-adjusted abnormal return ($MAAR_{x,i}$) for stock 'x' after i^{th} trading period is calculated as follows:

$$MAAR_{x,i} = 100 \times \left\{ \frac{\left(1 + R_{x,i}\right)}{\left(1 + R_{m,i}\right)} - 1 \right\}$$

The market adjusted model measures the initial trading returns in excess market return form. This measurement was used in earlier studies on the short run performance of IPOs by economists such as [18] on Latin American IPOs and by [37] on their Pakistani IPOs.
The average market-adjusted abnormal return for the ith trading period is.

$$\overline{MAAR}_{x,i} = \frac{1}{N} \sum_{i=0}^{n} MAAR_{x,i}$$

Where $\overline{MAAR}_{x,i}$ = the sum of the market adjusted abnormal return of the sample IPOs divided by the number of sample IPOs.

Given these calculations, we test the following hypothesis:
H_0: The average market-adjusted abnormal return ($\overline{MAAR}_{x,i}$) for IPOs on the JSE is equal to zero.
H_1: The average market-adjusted abnormal return ($\overline{MAAR}_{x,i}$) for IPOs on the JSE is different from zero.

To test the hypothesis that $\overline{MAAR}_{x,i}$ equals zero, the following t-statistic is calculated:

$$t = \frac{\overline{MAAR}_{x,i}}{s/\sqrt{n}}$$

Where 's' is the standard deviation of $\overline{MAAR}_{x,i}$ across the companies.

3.3 Hot and Cold Issues

The hot and cold issue market in this study was defined based upon the highest volume of listings per annum on the JSE. This method of differentiating hot and cold issue markets is per the definition of a hot issue period market by [11], [10] and [9] i.e., based on the annual volume of new listings.

4. RESULTS

4.1 Market Adjusted Abnormal Return (MAAR)

The results on the raw return, the average market return and the market adjusted returns are shown in Table 1.

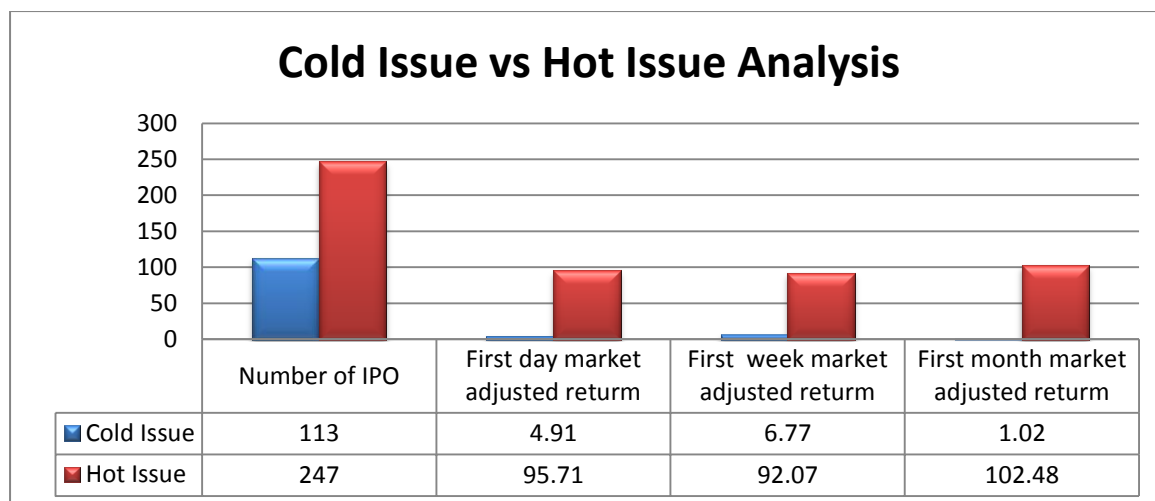**Table 1: Market adjusted abnormal return for the period 1996-2011**

Return	Raw Return	Avg. Market Returns (%)	Market Adj. Abn. Return (%)	Std. Dev.	T - Statistics
First day	67.41%	-0.05%	67.51%	3.5357	3.6227*
First week	65.42%	-0.48%	67.82%	3.1858	4.0388*
First month	68.69%	2.58%	70.43%	3.6581	3.6530 *

*Significant at 1%

From table 1, it is established that IPOs on the JSE are underpriced with average market-adjusted returns of 67.51%, 67.82% and 70.43% for the first day, first week and first month respectively and these results are significant at 1% for a sample of 360 companies listed on the JSE from 1996-2011. Also observed is the fact that the first month return show the highest return, followed by the first week and then the first day. These finding indicate that the investors can profit buying the new issues at the offer price and sell them at the end of the first month trading period. However, the abnormal return on the first day is only marginally lower than the first month return, indicating little incentive not to sell on the first day of trading. Using a sample of 118 IPOs on the JSE for the period 1980-1991, [38] established that the average market adjusted return was 32.7%. Likewise, [14] using data for 138 South African IPOs that were listed on the JSE from 2006 to 2010, found significant short run underpricing on the JSE, with an average market-adjusted return for the first trading day of 108.33%. Comparing the level of underpricing in South Africa of 67.41% to other developing countries such as 92.7% in India for the sample of IPOs dating from 1990 to 2007 and 96.6% in Malaysia for a sample of IPOs dating from 1980 to 2006 ([17]), it is quite similar for emerging countries. The t-values measured confirm that the hypothesis can therefore be rejected and one can conclude that the average market-adjusted return is significantly different from zero.

4.2 Hot and Cold Markets

Figure 1: Descriptive statistics of cold and hot issues

Cold Issue vs Hot Issue Analysis

	Number of IPO	First day market adjusted return	First week market adjusted return	First month market adjusted return
Cold Issue	113	4.91	6.77	1.02
Hot Issue	247	95.71	92.07	102.48

From figure 1, it is observed that 113 IPOs were listed in a cold market period while 247 of the IPOs were listed in a hot market period. Also evident is the fact that IPOs on the JSE are substantially more underpriced in the hot markets as their first day, first week and first month average market-adjusted returns are much higher than in the cold market. These findings are consistent with similar studies conducted on the JSE by [11] for a period of 1975 to 1995; [12] for a period 1975 to 1999 and [13] for a period of 1996-1999.

**Table 2: Market Adjusted Abnormal Return for hot and cold market periods**

		Raw return	Average Market return	MAAR (%)	T - Stats
1996 (Cold market)	First day	11.04%	-0.22%	11.29%	1.7538
	First week	7.78%	-0.29%	8.01%	1.2782
	First month	4.34%	-1.73%	5.94%	0.9233
1997-1999 (Hot Market)	First day	87.37%	-0.26%	87.92%	6.1362*
	First week	84.58%	-0.61%	85.79%	5.9474*
	First month	92.99%	4.44%	97.67%	5.1187*
2000-2005 (Cold Market)	First day	8.20%	0.06%	8.17%	2.7355
	First week	14.42%	0.09%	14.43%	2.0060
	First month	9.51%	1.03%	8.30%	1.2506
2006-2007 (Hot Market)	First day	113.73%	0.28%	113.01%	1.4655
	First week	108.27%	0.38%	105.93%	1.5719
	First month	113.63%	1.81%	112.36%	1.4849
2008-2011 (Cold Market)	First day	-1.06%	0.04%	-1.04%	-0.4699
	First week	-2.30%	-0.24%	-1.88%	-0.5766
	First month	-9.92%	0.55%	-10.29%	-3.4832*

*Significant at 1%; ** Significant at 5%, *** Significant at 10%

The results in table 2 show that for the period 1996-2011, two hot market and three cold market periods were identified on the JSE based on the number of IPOs issued during those periods. The two hot market periods (1997-1999) and (2006-2007) recorded the highest levels of underpricing, with the period (2006-2007) recording the highest value, though the t-statistics are not significant, while the period (1997-1999) being statistically significant at the 1% level. The cold market periods (1996) and (2000-2005) recorded the lowest level of

underpricing, though only the t-statistics results of their first day average adjusted returns are statistically significant at the 5% level. Furthermore, the cold market period (2008-2011) showed that the IPOs during these periods were overpriced, with the t-statistics results of first month being significant at the 1% level. These findings are consistent with studies by [9] and [10] which affirm that hot IPO markets are characterized by severe underpricing while cold IPO markets have less underpricing. Conversely, other studies by [39] found that overpriced IPOs are issued in cold market conditions.

Figure 2: First day market adjusted returns based on IPO offer price
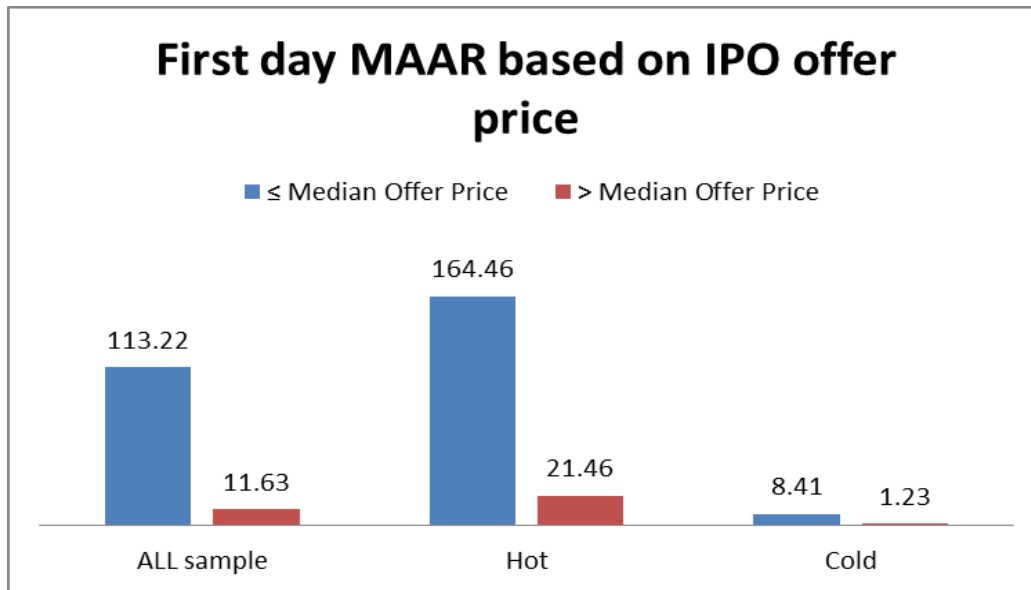

The results from figure 2 show the levels of underpricing based on median IPO offer price. The median was chosen as the best measure of central tendency due to the existence of numerous outliers in the IPO offer price. The median is used to determine how the level of underpricing is affected by the offer price. The calculated medians were 100 cents, 200 cents and 200 cents for the hot period, cold period and entire sample respectively. The results from both the hot market IPOs, cold market IPOs and the combined sample from 1996-2011 show that IPO with an offer price less than or equal to the median are highly underpriced (approximately 6 to 9 times higher) compared to those issued at an offer price above the median. The results indicate that as the offer price increases above the median for any given period, the level of underpricing drastically decreases. This is in line with prior studies ([28]; [29]) that also identified a decreasing trend in the level of underpricing as the offer price increased. With this trend in mind investors can maximize their short term return focusing on IPOs with the smallest offer price.

4.3 Sectorial Analysis

In Figure 3 IPOs were classified as cyclical, defensive, growth and interest sensitive shares with the intent to assess whether the level of underpricing is influenced by sectors.

Figure 3: Descriptive statistics of IPO listings across sectors

Descriptive statistics of IPOs listings across sectors
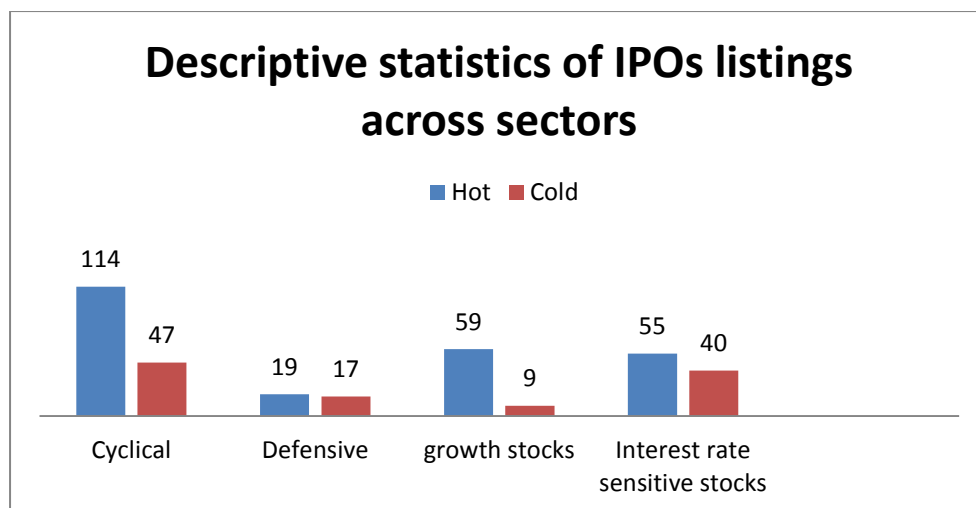
From figure 3, the results depict that the highest number of IPO listings were recorded in the cyclical sector both in the hot and cold market periods, while the least number of listings were found in the defensive sector and growth stock, both in the hot and cold market periods. It is evident that issuers of specifically cyclical and growth shares attempt to time their listings with the majority of the IPOs listed in the hot market periods. In contrast, the timing of IPOs in the defensive and interest rate sensitive sectors are not really influenced by hot and cold market periods. This finding is consistent with a study by [23] on the Dutch IPOs, which observed the hot market period was dominated by cyclical stocks and growth stocks.

Table 3: Sectorial analysis of Hot and Cold market IPOs

Industry	Returns	Market periods	MAAR (%)	Standard deviation	T statistics
Cyclical	First day	Hot market period	47.0	168.2	2.9850*
		Cold market period	3.5	19.3	1.2580
	First week	Hot market period	48.1	173.2	2.9264*
		Cold market period	8.5	48.4	1.1974
	First month	Hot market period	58.0	242.2	2.5558***
		Cold market period	-0.1	40.6	-0.1522
Defensive	First day	Hot market period	14.2	36.4	1.6944
		Cold market period	6.4	26.3	0.9996
	First week	Hot market period	16.1	48.0	1.4574
		Cold market period	5.1	28.9	0.7297
	First month	Hot market period	9.5	59.6	0.6951
		Cold market period	-3.4	27.8	0.5016
Growth stock	First day	Hot market period	109.1	167.1	5.0116*
		Cold market period	21.96	34.7	1.8961***
	First week	Hot market period	100.6	140.2	5.5117*
		Cold market period	24.6	44.8	1.6442
	First month	Hot market period	106.4	186.2	4.3894*
		Cold market period	25.7	57.5	1.3414
	First day	Hot market period	212.4	841.0	1.8733***
		Cold market period	2.06	12.2	1.0724
	First week	Hot market period	201.6	740.3	2.0197**
		Cold market period	1.5	22.9	0.4011

Interest rate sensitive	First month	Hot market period	222.6	830.0	1.9893**
		Cold market period	-5.3	23.4	-1.4345

*Significant at 1%; ** Significant at 5%, *** Significant at 10%

The results in table 3 show the sectorial analysis of hot and cold market IPOs on the JSE. It is clear that the level of underpricing differs substantially in the different sectors and specifically in the hot market periods. The level of underpricing for interest rate sensitive stock at 212.2% (average for one day, one week and one month) in hot market periods was statistically significant at a 5% level. It is, however, worth noting that the exceptionally high level of underpricing of interest rate sensitive stock in hot market periods was predominantly influenced by only two of the 55 shares with underpricing of in excess of 1 000%. If these two shares were excluded, the level of underpricing would be 79.9% for interest rate sensitive stock in hot market periods. In contrast, at -0.58% there are no signs of underpricing for interest rate sensitive stock in cold market periods.

The second highest level of underpricing was growth stock (105.4%) in the hot market periods (1% sig.). These results are confirmed by [23] who established that growth stock IPOs were highly underpriced during hot periods (35.8%) compared to 9.2% during the cold periods. Although only statistically significant for first day MAAR at 10%, growth stock with an average mean market-adjusted abnormal return of 24.1% shows by far the highest level of underpricing in cold market periods. It could be reasonable to assume that growth stocks are predominantly younger companies in emerging industries, which could explain the relatively high level of underpricing in both hot and cold markets.

Cyclical stocks are significantly underpriced with, on the average, a MAAR of 51.0%, although much less than interest rate sensitive or growth stock. With a MAAR of 4.0% the cyclical stock are not underpriced in cold market periods. Defensive stocks are the only shares which are not significantly underpriced in either hot (13.3%) or cold (2.7%) market periods.

5 CONCLUSION

The empirical findings obtained in this study indicate that IPOs on the South African Stock Exchange (JSE) are underpriced, which is consistent with similar findings across various stock markets around the world. The mean market-adjusted abnormal return of IPOs with an average of 67.5% on the first day of trading confirms substantial levels of underpricing in South Africa, similar to other emerging countries. Only five (1997-1999 and 2006-2007) of the 16 years (1996-2011) investigated were regarded as hot market periods with 68.6% of the IPOs listed in these two hot market periods, clearly indicating that companies are attempting to time their initial listings. Regardless of this attempt to time the initial listings, the level of underpricing in hot market periods was substantially higher than in the cold market periods.

Investors could earn substantial first day abnormal returns investing in IPOs in hot market periods (95.7%) as oppose to in cold market periods (4.91%). There is, however, very little incentive for investors in both hot and cold market periods to keep the stock for one week or one month. Although not significant, the level of underpricing in hot market periods has increased from the hot market in 1997-1999 to hot market in 2006-2007. In addition, the offer price also impacts substantially on the level of underpricing. The findings clearly indicated that specifically in hot market periods, IPOs with offer prices equal or lower than the median

offer price had significantly higher levels of underpricing (164.46%) than IPOs with higher offer prices (21.46%). Focusing on the IPOs in different sectors, it is clear that issuers of especially growth stock and cyclical stock attempt to time their listings in hot market periods. Interest rate sensitive, growth and cyclical stock companies also have significantly high levels of underpricing in hot markets. There is almost no evidence that any of these sectors show any signs of underpricing in cold market periods.

From an investor point of view, it is evident that IPOs in an emerging country such as South Africa are significantly underpriced with huge profit potential. The results also confirm that investors could benefit significantly more investing in IPOs only during hot market periods, focusing on the IPOs with relatively low offer prices, and interest sensitive, growth and cyclical stock. There are also minor differences between mean market-adjusted abnormal return for the first day, first week and first month, indicating some form of market efficiency. The focus with this paper was primarily on the short term return and underpricing of IPOs in hot and cold market periods. Further research is, however, needed to compare these high levels of underpricing in hot markets to the three and five year long term performance of IPOs in South Africa. In conclusion, the level of underpricing of IPOs in South Africa during hot market periods (more than 92%) creates an opportunity for investors, but also indicate major losses for existing shareholders of these IPO companies. The question remains whether these high levels of underpricing in hot markets are caused by conservative issuers not pricing their stock aggressively or the worldwide high failure rates and unattractiveness of IPO market currently.

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