

**Gordon Institute
of Business Science**
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**The long-run performance of Initial Public Offerings on the
Johannesburg Stock Exchange**

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Abstract

This report examines the long-run performance of Initial Public Offerings on the Johannesburg Stock Exchange. The primary objective is to calculate the cumulative average abnormal returns using simpler models such as a market model or a single parameter CAPM and then to introduce a risk adjusted style model to determine whether the significant returns would disappear. These risk factors include the size of the firm, a value versus growth factor as well as an adjustment for the resource focussed Johannesburg Stock Exchange. The secondary objective of this report is to calculate the returns of event firms engaging either a prestigious underwriter or those that do not as well as the calculation of the returns of large firms and non-large firms.

Event study methodology was used on the 48 Initial Public Offerings on the Johannesburg Stock exchange from 01 January 2006 to 31 May 2016 that formed part of the All Share Index. The study determined the cumulate average abnormal returns over a 36 month period after the event date and was tested at the 5% level of significance through the use of a Monte Carlo bootstrap simulation.

The results show that the cumulative average abnormal returns found using simpler methods were in fact significant and that these significant returns disappear when a risk adjusted style model was introduced. Further, the results showed that using either a prestigious underwriter or a non-prestigious underwriter yields insignificant cumulative average abnormal returns and that larger firms outperform non-larger firms yielding significant positive returns.

Key Words

Initial Public Offering, IPO, Long-run Performance, Firm Size and Underwriter Reputation

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Wynand Snyman

07 November 2016

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1. INTRODUCTION TO RESEARCH PROBLEM

1.1 Research title

The long-run performance of Initial Public Offerings on the Johannesburg Stock Exchange.

1.2 Research problem

Initial Public Offerings (“IPOs”) are of great importance as they are a source of market and economic growth and provide an opportunity for investors and issuers to generate wealth. South Africa suffers from chronic unemployment and sources of economic growth and job creation form a key part of South Africa’s National Development Plan (National Planning Commission, 2010).

An event such as an IPO presents an investor and the issuer with a unique investment opportunity. The investor would consider the contents of the prospectus and source additional information on the entity to determine the value to be derived in taking the risk of investing in a firm without a public record of share price performance. Taking a risk by investing in a firm through an IPO creates the perception that a potential high reward can be generated, with the acceptance of an appropriate level of risk. The firm may not be known to a wide range of investors and the public track record of share price performance may not be known.

Fama (1970) and Fama (1991) state that the Efficient Market Hypothesis proposes that market prices fully reflect all known information and that market prices fully reflect all known information to the point where marginal benefits to the decision do not exceed the marginal costs of the decision. This hypothesis suggests that investors would be able to make investment decisions without being exposed to abnormal returns.

The research of Jay R. Ritter is seen by many as some of the first significant papers with a focus on long-run post-IPO performance. Ritter (1991) and Loughran & Ritter (1995) found that IPOs significantly underperform the benchmark in the long-run. The research focussed on the 36 month post-listing performance of IPOs where the metrics of the study were the three year buy-and-hold abnormal returns (“BHAR”) as well as cumulative average adjusted returns (“CAR”) when compared to a benchmark.

A recent study of Bessembinder & Zhang (2013) confirmed the common understanding that significant underperformance can be observed after an IPO event when using BHAR as a method of analysis in a United States context. They were able to explain the abnormal returns found after taking into account additional risk factors.

Reviewing the long-run performance of United States IPOs, Carter, Dark, Floros and Sapp (2011) found long-run underperformance over a 36 month period. However, introducing a risk adjusted model resulted in the finding that these issues do not underperform when compared to the benchmark.

From the literature review conducted it is clear that simply looking at BHAR and CAR as the method of analysis without adjusting for specific factors presents findings of significant long-run underperformance. Adjusting for additional factors have proven to explain abnormal returns and therefore is an opportunity to further understand the performance in a specific market.

No study was found in the South African context with an aim to incorporate risk adjustments in order to understand whether the abnormal returns found under the traditional methodology would disappear. This research report aims to conduct research in the South African context with the aim to understand whether the findings noted in a United States as well as other contexts could be taken into account in order to explain abnormal returns in the long-run. Reviewing the long-run performance of IPOs in a South African context will provide significant value to a wide range of stakeholders as no recent literature would be found where this assessment was done.

Further to the long-run performance of IPOs, various key research reports considered other factors that impact on the long-run performance. These factors either reduce or further increase the long-run underperformance and similarly to the statement made above, no research was found where these factors were considered. The factors identified included the quality of the underwriter engaged as part of the listing process as well as the size of the listing itself.

There are a number of key research articles on the impact of the quality of the underwriter engaged as part of the listing process. The evidence suggests that the more prestigious the underwriter is in the market, the more favourable the performance of the firm is in the long-run. Factors that are put forward include that underwriters follow a screening process to ensure that they only engage with firms that are suitable as well as the assurance that underwriters provide as part of their involvement. This includes the review of historical and projected data to ensure appropriateness as well as to review and manage the information sharing process with potential investors (Dong, Michel & Pandes, 2011 and Su & Bangassa, 2011).

The size of the listing is a key factor in the long-run performance of firms. Studies have indicated that the larger the listing event is, the lower the underperformance is in the long-run (Carter, Dark, Floros & Sapp, 2011).

1.3 Research objective and aim

The primary aim of the research report is to determine whether significant long-run abnormal returns are observable in a South African context using an updated dataset and methodology. Investors have the opportunity to generate favourable abnormal returns should they be able to understand whether IPOs in South Africa provide an opportunity to assume risk in order to yield returns.

The underwriter plays a key role in the listing process and partnering with a prestigious underwriter may yield different returns when compared to non-prestigious underwriters.

Investors may be able to factor these criteria in the valuation of an IPO and issuers may elect to pay a premium in order to yield more favourable long-run returns.

The size of the listings observed in any market spans a vast range, with smaller firms as well as large multi-national firms electing to offer shareholding to the public. To participate in an offering of different sizes may afford an investor with an opportunity to understand risk and potential reward and therefore it would be valuable information to understand the performance of larger firms in contrast to smaller firms.

In summary, the research has the following aims:

- To understand whether there are significant long-run abnormal returns observable on the Johannesburg Stock Exchange (“JSE”) using an updated dataset of firms that are included in the All Share Index (“ALSI”).
- To determine whether there are a significant difference between the long-run returns generated by firms that utilise prestigious underwriters and firms that do not use prestigious underwriters and the benchmark.
- To determine whether there is a significant difference between the long-run returns generated by larger firms and non-large firms and the benchmark.

1.4 Research scope

The scope of the research will be limited to IPO events launched in a South African context. The IPOs vary in size, sector, industry and event date.

The following criteria were used to include events in the scope of this research report:

- The event took place on the JSE from 01 January 2006 – 31 May 2016, inclusive of both dates.
- The event took place on the JSE Main Board and therefore excludes events that took place on the Alternative Exchange (“AltX”).
- The firm should form part of the ALSI.

1.5 Conclusion

The chapter provided an introduction to the research problem and is intended to observe the market efficiency as these events become public. The objective of this research study is to address the research problem through the research objective and research aim, with reference to the scope inclusions and scope exclusions.

2 LITERATURE REVIEW

The long-run performance of IPOs have been reviewed and documented in many forms over the past number of decades. These publications include the focus on the initial under-pricing (when the IPO is launched) as well as the long-run performance of the share when compared to a benchmark.

The findings have largely been consistent, with material initial under-pricing being identified, followed with increasingly greater long-run performance up to three years after the event. As research develops on this topic, it continues to be apparent that the model used to assess the long-term performance as well as the timing of the event are relevant. The literature review conducted as part of this study, reveals a similar pattern, with a few specific and isolated exceptions.

Lin & Tian (2012) define initial under-pricing as the substantial increase in the share price on the first day of trading. They explain that the phenomenon is well documented in the United States as well as in Europe, Asia-Pacific and Latin America. For the purpose of a long-run test the initial under-pricing is typically not included as part of the testing due to the significant fluctuations experienced in the short-term.

Eugene Fama is arguably one of the leaders on the Efficient Market Hypothesis and he published a paper in response to the high frequency of academic papers being published on the long-run performance after specific events. He asks whether efficiency should be disregarded due to the repeat findings proposing alternative considerations being published. His findings are conclusive in that the overreaction and the under-reaction are roughly split even and that these findings are sensitive to the model used as well as the different statistical approaches used and that efficiency should not be disregarded as most long-run anomalies can be attributed to chance (Fama, 1998).

Many factors can have a significant impact on the long-run performance of IPOs, with some factors increasing the underperformance and others mitigating the

underperformance. As part of the literature review, some of these factors were focused on with the aim to further understand the impact that could be observed.

In reviewing the literature, it became apparent that no recent study in the South African context is available. The published studies that were reviewed were done with different methodology and on a different dataset.

2.1 Long-run IPO performance

The research of Ritter (1991) initially indicated that markets are not always efficient and that in many cases, investors are exposed to underperformance or stand to benefit from over performance. The inefficiency was underlined by the various pieces of subsequent literature that was reviewed as part of this research report. The research conducted as part of this research report indicates the existence of significant abnormal returns in both the short-run as well as in the long-run after an IPO.

Research published by Ritter (1991) and Loughran & Ritter (1995) proposed that IPOs significantly underperform the benchmark in the long-run. The earlier research by Ritter is seen by many as significant in assessing the long-run performance of IPOs as it forms the basis for a significant part of the studies conducted in the field as well as due to the citation frequency. The research focussed on the 36 month post-listing performance of IPOs where the metrics of the study were the three year BHAR as well as CAR when compared to a benchmark. The research revealed significant long-run underperformance of up to +29.1% and it was proposed that this could be attributable to factors such as over-optimistic projections, industry fads as well as elements of bad luck.

Bessembinder & Zhang (2013) again noted that there is a common understanding that significant underperformance can be observed after an IPO event when using BHAR as a method of analysis. They proposed that one should account for additional variables or characteristics between the event firm and the control firm in order to explain the abnormal returns. Differences that were taken into account in this study

were additional firm characteristics, including idiosyncratic volatility, illiquidity, return momentum and capital investment. The results of taking into account all seven additional factors into the regression model indicated a reduction in the abnormal returns by two thirds, while eliminating it in totality through variations in the characteristics.

Carter, Dark, Floros and Sapp (2011) reviewed the long-run underperformance of US IPOs conducted between 1981 and 2005 and found that the event firms underperformed the benchmark by -16.9% using BHAR at the end of the 36 month period under review. It was further established that upon reviewing the long-run performance of IPOs on a risk adjusted basis that these event firms do not underperform when compared to the benchmark. In addition, it was noted that there are specific periods in which varying levels of performance could be observed and therefore emphasizes that the sample period in different studies may have a significant impact on the findings. The sample was evaluated for abnormal returns when using BHAR as the method of analysis. Contrasting the results found to the control benchmark, identified significant underperformance in the earlier parts of the sample. However, it was noted than when using a Fama-French three-factor regression that the underperformance noted using BHAR disappears in the early part of the sample. The findings also noted that IPOs outperformed the control benchmark during the later parts of the sample. The findings revealed no evidence of underperformance in the 36 months subsequent to the IPO. It was proposed that the Fama-French three-factor model alone is sufficient to explain underperformance in the 36 months after an IPO.

The Fama-French three-factor model contains the three factors of the overall market, company size and book-market equity. The model is used to control for event clustering and cross-correlation in IPO returns (Ahmad-Zaluki, Campbell & Goodacre, 2007).

Research on the long-run performance of IPOs on the JSE was published by Page & Reyneke (1997). Their research was conducted to determine whether the well documented long-run underperformance noted in other markets such as the USA and the UK, would also be found on the JSE. The sample of 118 IPOs between 1980 and

1991 was reviewed using size and Price Earnings (“PE”) matched companies to determine any long-run abnormal performance over a 48 month period after the event date. Their findings were that the long-run underperformance was significant to the point where it outweighed the initial short-term under-pricing identified. Firms achieved holding period returns of -63.5% over the 48 months period when compared to size matching portfolios, -106.9% when compared to PE matching portfolios and -96.4% when compared to sector portfolios.

The research considered the documented research on IPOs that are launched during ‘hot issue’ markets which present more pronounced underperformance and this was confirmed through reviewing the data in this study. Firms launched in the 1987 period outperformed the benchmark by +87.1%, while the firms launched in the balance of the study underperformed the market by -18.6%.

The research published by Cai, Liu and Mase (2008) studied the long-run performance of Chinese IPOs listed on the Shanghai Stock Exchange (“SSE”). 336 firms were reviewed and the findings were consistent with Ritter (1991), where significant long-run under-performance of -29.6% was noted. Their research also revealed that IPO performance is positively related to factors such the size of government shareholding retained after the event and the allocation of additional shares after the listing.

Gregory, Guermat and Al-Shawawreh (2010) conducted research on the long-run returns achieved of IPOs on the London Stock Exchange (“LSE”). The purpose of the research was to establish the long run performance of United Kingdom IPOs with reference to a significantly expanded period when compared to previous studies. The 36 months BHAR was significant at -16.4% and -47.6% at 60 months.

A study by Chi, McWha & Young (2010) on the long-run performance of IPOs on the New Zealand Stock Exchange was reviewed. It was found that the performance of IPOs during the period was significantly weaker than the performance of the market when reviewing the BHAR and CAR against the market.

Ahmad-Zaluki, Campbell & Goodacre (2007) published research that is contradictory to the largely consistent literature that has been reviewed. Their findings were based on long-run performance of 454 Malaysian IPOs from 1990 - 2000 where they noted that IPOs outperformed the benchmark up to 36 months after the listing event using an equal weighted calendar time approach. This over performance disappears when a value weighted approach is followed or when the Fama-French three-actor model is used. These findings further reinforced the different propositions that the long-run performance is highly dependent on the timing of the IPO and the method applied to determine abnormal returns.

Thomadakis, Nounis & Gounopoulos (2012) found patterns in the Athens Stock Exchange (“ASE”) that also contradict other research. Reviewing the long-run performance of 254 Greek IPOs that took place from 1994 to 2002, it was noted that over-performance in the short-run lasts for much longer than have been found in similar studies done in the United States of America and the United Kingdom. Long-run underperformance was noted at the third year after going public, which aligns to other research.

Their study proposes that the timing of the large number of the IPOs under review is an important consideration. Greece’s entry into the Eurozone in 2001 coincided with a wave of large IPOs from 1998 – 2000, together with regulatory modernisation of the industry. The Greek exception is therefore noted in that the observation of over-performance extends longer than what has been reported in similar studies, yet underperformance is observed at the end of the 36 month period which is in line with the typical observation noted.

Chorruk & Worthington (2010) examined 136 IPOs on the Thai Stock Exchange (“TSE”) to determine the long-run post IPO performance. The data was collected and the following metrics examined: cumulative abnormal returns, buy-and-hold abnormal returns and wealth relatives. The findings were that IPOs on the TSE tend to outperform the benchmark for up to 24 months after the listing, from where under-performance sets in. At 36 months after the IPO, the firms underperform the benchmark by -25.4%.

A wealth relative is used as an indicator of long-run performance and calculates a ratio between the period-end wealth of a portfolio and the period-end wealth of the benchmark (Chorruk & Worthington, 2010).

Similar to the findings on the ASE, the TSE over performs the benchmark for a longer period than what has been found in similar research done on US and UK markets. The consistent finding is that significant under-performance is reported at 36 months post IPO.

Su & Bangassa (2011) reviewed the long-run performance of 590 Chinese IPOs during 2001 – 2008 and found that the IPO firms underperformed the benchmark by -21.7% up to 36 months after the event. This is consistent with the -21.2% long-run underperformance noted by Cai et al. (2008) in a similar Chinese context.

Levis (2011) examined the long-run performance of 1 595 United Kingdom IPOs with event dates between 1992 and 2005. The findings were that significant long-run underperformance of -13.5% using the BHAR was found. In adjusting the BHAR from equally weighted to value weighted, the long-run underperformance disappeared.

In research published by Bessler & Thies (2007), they examine the long-run performance of IPOs on Germany. Their findings are consistent with popular research published in that the IPOs significantly underperform the benchmark in the long-run.

It is therefore clear that the underperformance first found by Ritter (1991) largely persists today across a wide range of markets. The work done by Carter, Dark, Floros and Sapp (2011), Bessembinder & Zhang (2013) as well as Ahmad-Zaluki, Campbell & Goodacre (2007) where abnormal returns were fully explained by incorporating specific additional risk factors, presents the opportunity to expand on the available research, specifically in a South African context where such data is not available.

Table 1 presents in a simple format a summary of the literature reviewed, the size of the sample, the period under review as well as the measurement tool used with the related performance. It is a source of information in a summarised format.

Table 1: A summary of the long-run performance of IPOs

Country	N	Time	Period	Measurement Tool	Return
United States of America	6 686	1981 - 2005	36 Months	BHAR	-16.9%
Greece	254	1994 - 2002	36 Months	BHAR	-31.4%
Thailand	136	1997 - 2008	36 Months	BHAR	-25.4%
United States of America	1 526	1975 - 1984	36 Months	CAR	-29.1%
China	335	1997 - 2001	36 Months	BHAR	-29.6%
United Kingdom	2 499	1975 - 2004	60 Months	BHAR	-47.6%
New Zealand	101	1991 - 2005	36 Months	BHAR	-27.8%
Malaysia	454	1990 - 2000	36 Months	CAR	+0.4%
South Africa	118	1980 - 1991	48 Months	BHAR	-63.5%
United States of America	8 966	1980 - 2005	60 Months	BHAR	-50.0%
United States of America	4 753	1970 - 1990	36 Months	BHAR	-44.0%
China	590	2001 - 2008	36 Months	BHAR	-21.7%
United Kingdom	1 595	1992 – 2005	36 Months	BHAR	-13.5%
Germany	218	1977 - 1995	36 Months	BHAR	-12.7%

2.2 Underwriter quality

As part of the IPO process, the issuer appoints an underwriter who is responsible for various key aspects of the listing process. The underwriter assists with the preparation and verification of the information that will be made public to potential investors as well as forming an estimation of the listing price. For an issuer, an experienced underwriter with relevant market knowledge and a strong reputation supporting and managing the IPO process will contribute to raising interest and demand for the firm's shares. Further, the underwriter typically manages and coordinates a marketing ("book-building") campaign, with the aim to raise interest and ensure an oversubscribed issue.

Chang, Chung & Lin (2010) defines an underwriter as a party engaged by the issuing firm to purchase, market and distribute shares to potential public investors. The role of the underwriter in the IPO process has been identified as material as it was noted on a consistent basis that the involvement of prestigious underwriters in the IPO process results in lower levels of long-run underperformance.

As part of the IPO process, underwriters would certify information being shared with investors and the better the reputation of the underwriter, the higher the reliance placed on the appropriateness of the information being shared. Underwriting managers also reduce the information uncertainty associated with a new listing by increasing the public knowledge available to possible investors.

Dong, Michel and Pandes (2011) published a study focussed on assessing the impact of the quality of the underwriter involved in the IPO on the long-run performance of the firm. The factors that were focussed on include the underwriter reputation as well as the number of underwriting managers involved in the process of going public. The marketing done by underwriting managers created demand for the share which in turn increased the long-run performance of the shares. A positive relationship was found between the underwriter quality and the long-run IPO performance.

Jenkinson & Jones (2009) published work that focussed on the recent development of the competitive IPO process. The traditional process would allow for the appointment of an underwriter early in the process, based on high valuations and other initial indications observed by the issuer. More often than not, once appointed the underwriter reduces the issuing price to ensure a full take up and strong initial performance. The competitive bidding process includes the disaggregation of roles with the appointment of roles later and the process and the inclusion of variable compensation agreements which ensures that the underwriter's process serves the needs of both the issuer and investor. The resulting impact includes having the issue pricing being closer to the fair value.

Su & Bangassa (2011) examined the long run performance of Chinese IPOs on the Shanghai Stock Exchange and the Shenzhen Stock Exchange. The goal of the study was to be able to understand what the impact of the underwriter's reputation would be on the long-run performance of the IPO. It is argued that information uncertainty is reduced through the involvement of a prestigious underwriter due to the certification process followed as part of going public with the aim to raise capital from investors. Further, prestigious underwriters have to protect their reputation and manage their exposure to litigation and therefore will ensure that they are only associated with high quality IPOs. Investors are more likely to invest in the IPOs underwritten by more prestigious firms due to higher quality of information made public as well as relying on the selection process followed prior to engaging with the firm in the capital raising process.

The study found material long-run underperformance when referenced to the market benchmark, which is consistent with most of the literature reviewed. It was further found that the long-run performance of Chinese IPOs managed with prestigious underwriters performed significantly better than those IPOs managed by less prestigious underwriters. Therefore, the conclusion was reached there is a significant relationship between the underwriter selected and the long-run performance of an IPO.

In assessing whether an underwriter is a prestigious underwriter or not, Su & Bangassa (2011) used a number of factors. They followed Megginson & Weiss (1991)

which determined underwriter quality with reference to their market share held. This proposed the calculation of the capital raised by underwriting firms, relative to the total capital raised. Further, Su & Bangassa (2011) proposed that the more IPOs an underwriter manages, the more well-known and prestigious they are. These are measures that can be used where research is conducted in markets where public indicators and information on underwriter reputation is not widely and publicly available.

Chang, Chung & Lin (2010) proposed that earnings management leading into an IPO is a key driver of long-run underperformance. Managers use earnings management to present the performance of the issuer more favourably with the intention to ensure that high demand for the shares is created. Due to the limited public information being available on private firms before going public, managers may be under pressure or have the incentive to increase the earnings to ensure that the listing price and subscription are favourably impacted.

As part of the services rendered by underwriters, they perform due diligence procedures to ensure that all relevant information is identified and documented. A high quality underwriter would ensure that their reputation is not adversely impacted through artificially inflated pre-listing earnings aimed at ensuring a full subscription. The findings supported the proposition that prestigious firms would ensure that earnings management is appropriate and reliably done and that the impact of the quality of earnings and the long-run performance of an IPO stock should be considered.

Thomadakis, Nounis and Gounopoulos (2012) found that the impact of reputable underwriters was to further increase the short-term performance as part of the “hot-issue”, resulting in increased levels of underperformance during the latter part of the study. The study was conducted using a sample of Greek IPOs that took place during a unique set of circumstances not observed in other pieces of literature and therefore sets an interesting and contrasting view on the traditional role and impact of the underwriter.

Huang & Zhang (2011) reviewed the importance of the marketing done around offerings of shares to the market. It shows that the discount on the issuance of shares was reduced through the marketing efforts as well as through the leverage of the networks of large underwriting managers. The hypothesis stands that the efforts of the underwriter forms a significant part in shifting and flattening the demand curve, resulting in more favourable issuance results for the issuer.

Table 2 presents a summary of the literature reviewed with reference to the quality of the underwriter. It presents the key finding from the item of literature that was reviewed.

Table 2: A summary of the long-run performance of IPOs with reference to underwriter quality

Reference	Country	Commentary
Dong, Michel and Pandes (2011)	USA	A positive relationship between underwriter reputation and firm performance was observed
Jenkinson & Jones (2009)	USA	The issue price was closer to the fair value
Su & Bangassa (2011)	China	A positive relationship between underwriter reputation and firm performance was observed
Chang, Chung & Lin (2010)	USA	A positive relationship between underwriter reputation and firm performance was observed due to data quality
Thomadakis, Nounis and Gounopoulos (2012)	Greece	Increased underperformance due to a "hot issue" market and a unique set of additional circumstances
Huang & Zhang (2011)	USA	Increased demand for shares reduced the initial discount at event date

2.3 Size of the listing

The impact of the size of a listing firm is a key factor to understand. Investors may either be drawn to larger and more established firms or perhaps to smaller firms that may yield higher returns. Various studies have been noted that investigate the long-run performance with reference to the size of the listing and the results have not been conclusive. Specifically, no such recent study was found in the South African context

which included the incorporation of risk adjustments to explain significant returns and therefore work in this topic will add to the current literature available.

Reviewing the work done by Carter, Dark, Floros and Sapp (2011), it was noted that when a sample of IPO firms is split into panels with smaller firms and panels with larger firms, that the smaller firms (-18.8%) tend to show increased levels of underperformance when compared to that of the larger firms (-14.2%). They conclude to state that the underperformance phenomena that was prevalent in the 1980s and early 1990's seems to have disappeared and that larger firms tend to give significantly better performance.

Cai, Liu and Mase (2008) indicate that the larger the Chinese firm is, the lower the performance is over the measurement period. This finding is in contrast to other research on the topic, yet it seems that the Chinese case offers a unique set of circumstance to take into account. Due to the involvement of the State in the Chinese economy, managers of large firms often invest in low yielding projects that contribute to the long-run underperformance noted.

Levis (2011) published a study that focussed on IPOs backed by PE firms in order to determine whether any different long-run performance patterns could be observed. The results showed that PE backed IPO firms outperformed the market benchmark by +13.8% using BHAR and by +22.5% when benchmarked against a size adjusted benchmark. Further, the over performance increased to +20.0% when using value weighted BAHAR compared to the market benchmark. It is put forward that PE backed firms are generally larger firms and the significant over performance noted supports the popular literature that larger firms perform better than smaller firms in the long-run.

Gregory, Guermat and Al-Shawawreh (2010) focussed on understanding the impact of the size of the listing on its long-run performance. They used a value-weighted BHAR model to calculate abnormal returns and found that the long-run underperformance found in their equally weighted testing disappeared, leading them to conclude that increased underperformance is associated with smaller IPO firms.

A study by Chi, McWha & Young (2010) found that firms with a larger market capitalisation also tend to outperform firms with smaller market capitalisation. The CAR of -42.4% reduces to -47.8% when adjusted for small firms and the BHAR reduces from -27.8% to -36.0% when adjusting for the same small firm index.

The research published by Ahmad-Zaluki, Campbell & Goodacre (2007) is again contradictory when focussing on the size of the listing. Their findings included that larger firms in the Malaysian context generate greater negative returns when compared to smaller firms and that those firms with smaller proceeds tend to perform better than those companies with larger proceeds. The over performance noted disappears when a value weighted scheme is applied and also when the Fama-French three-factor model is used.

The research published by Page & Reyneke (1997) confirmed a further well documented observation relating to the effect of the market capitalisation of the IPO firm. Research found that smaller firms tend to further underperform when compared to larger firms and this was confirmed in this research document as the returns for the Holding Period Returns of the largest category of firms of +74.6% is significantly greater than the -31.0% achieved by the firms in the smallest category.

Bessler & Thies (2007) was able to find that as the proceeds raised in the listing increases, so does the magnitude of the underperformance. They proposed that this may be due to the smaller firms investing carefully in projects that yield more favourable returns. In contrast, they also found that those firms that raised the highest proceeds on the IPO produced favourable returns, yet insignificant.

The table below presents a summary of the literature reviewed with reference to the size of the listing. It presents the key finding from the item of literature that was reviewed.

Table 3: A summary of the long-run performance of IPOs with reference to the size of the listing

Reference	Country	Commentary
Carter, Dark, Floros and Sapp (2011)	USA	Smaller firms tend to underperform larger firms
Cai, Liu and Mase (2008)	China	Larger firms tend to underperform smaller firms due to the nature of the Chinese regulations
Levis (2011)	UK	Smaller firms tend to underperform larger firms
Gregory, Guermat and Al-Shawawreh (2010)	UK	Underperformance was associated with smaller IPO firms
Chi, McWha & Young (2010)	New Zealand	Larger capitalisation firms tend to outperform smaller capitalisation firms
Ahmad-Zaluki, Campbell & Goodacre (2007)	Malaysia	Larger firms tend to underperform smaller firms
Page & Reyneke (1997)	RSA	Smaller firms tend to underperform larger firms

3 RESEARCH HYPOTHESIS

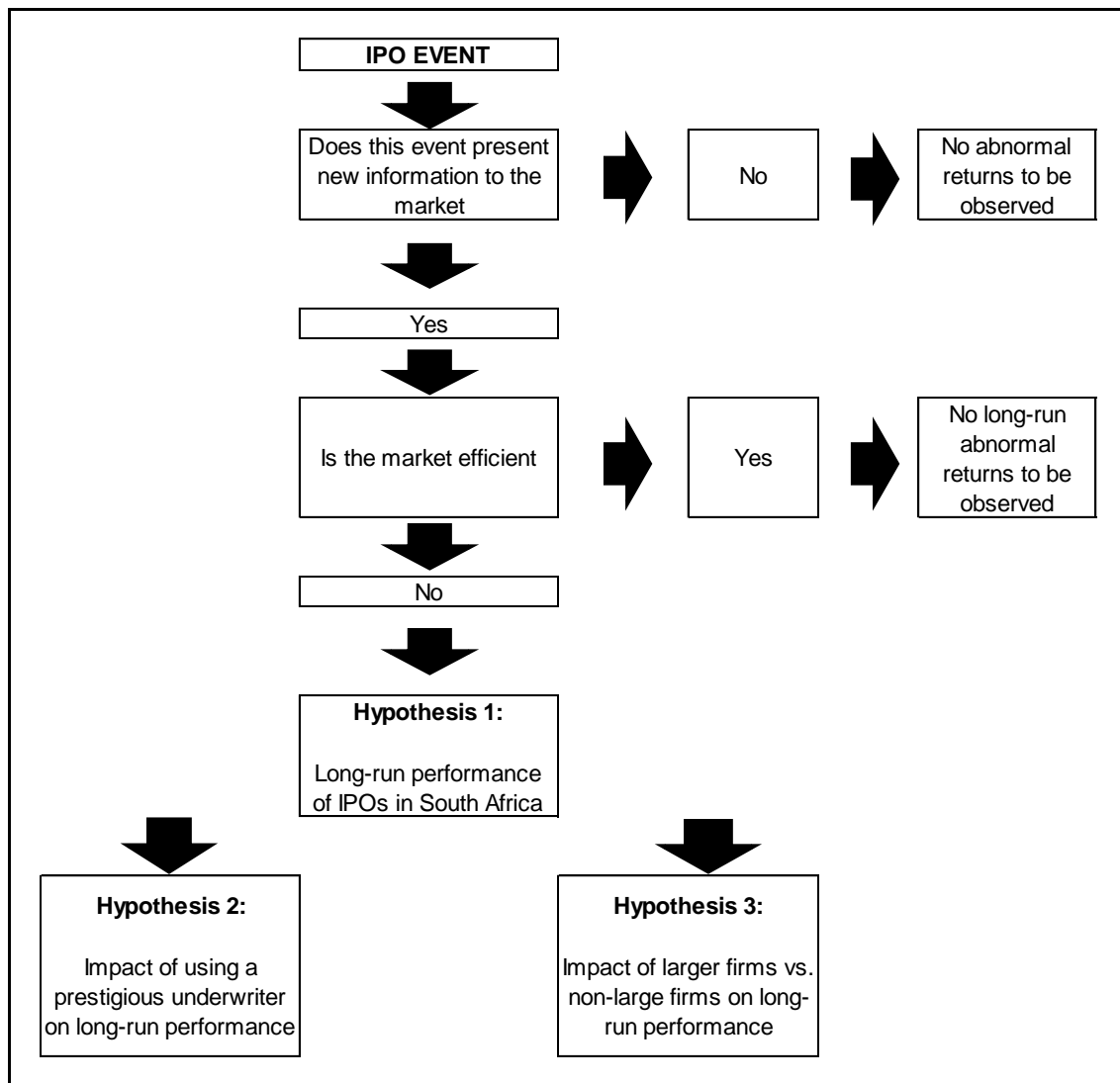
The primary aim of this study was to investigate the long-run performance of IPOs on the JSE. The literature review gave evidence of significant long-run underperformance in most markets. There was also strong evidence that the measurement of underperformance was significantly influenced by the method of computation and the existence of a hot-issue period or not. The typical study was done over a three year period.

In addition to the primary aim of this research report, the secondary objectives were to understand the impact of the size of the firm on its long-run post-IPO performance and finally, to understand the impact on the long-run performance of having a prestigious underwriter involved in the listing process.

The study examined new issues of shares to the public on the JSE during the period of 2006 to 2016. No study was found that reviewed the long-run performance of IPOs during this specific period and no study was found at all that focussed on the secondary objectives as outlined above.

Three hypotheses were identified as a result of considering the findings of previous studies as well as the further explanatory variables on the long-run performance of IPOs. The following diagrammatic illustration presents the hypothesis testing process together with the expected outcomes.

Figure 1: Diagrammatic illustration of the hypotheses to be tested



3.1 Hypothesis One

A market model, the Capital Asset Pricing Model (“CAPM”) as well a style model was utilised to evaluate the long-run performance of IPOs on the JSE. These models calculate the abnormal returns generated by the IPO firm over the 3 years following the event date against the return of the JSE’s ALSI as well as other benchmarks. The resulting abnormal returns will be used in the assessments performed.

Abnormal returns of zero indicate that there is no observable difference between the returns of the IPO firms and that of the benchmark.

Hypothesis One

H1₀: The abnormal returns of IPO firms using the market model, the CAPM and a style model are equal to zero.

$$\mu_{IPO} = 0$$

H1_a: The abnormal returns of IPO firms using the market model, the CAPM and a style model are not equal to zero.

$$0 < \mu_{IPO} > 0$$

3.2 Hypothesis Two

The literature review revealed a long-run performance factor that has not been tested in published research in the South African context. It indicates that the involvement of a prestigious underwriter has a positive relationship to the long-run performance of an IPO firm.

Firms will be aggregated in appropriate groups representing the quality of the underwriter and the abnormal returns will be calculated using the risk adjusted style model introduced in Hypothesis one.

Hypothesis Two

H2₀: There is no difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.

$$\mu_1 = \mu_2 = \mu_3 = \mu_4 = \dots \mu_n$$

H2_a: There is a difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.

$$\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \dots \mu_n$$

3.3 Hypothesis Three

An additional factor that was found to impact the long-run performance of IPO firms is the size of the firm when listing. In most cases, the performance of IPO firms is positively related to the size of the firm.

Firms will be aggregated in appropriate groups representing the size of the listing and the abnormal returns will be calculated using the risk adjusted style model introduced in Hypothesis one.

Hypothesis Three

H3₀: There is no difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.

$$\mu_1 = \mu_2 = \mu_3 = \mu_4 = \dots \mu_n$$

H3_a: There is a difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.

$$\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \dots \mu_n$$

4 RESEARCH METHODOLOGY

The purpose of this chapter is to clearly state the approach followed in order to evaluate the hypotheses identified in chapter three. It includes the research design, unit of analysis, population, sample size, the research instruments utilised and the data collection and analysis.

4.1 Research aim and design

The primary purpose of the study was to determine the long run performance of IPOs listed on the JSE and an event study methodology was deemed to be most appropriate. The secondary purpose of the study was to disaggregate the observations into groups with the following characteristics:

- Quality of underwriter engaged as part of the listing process
- Size of the listing

The daily share price data required for the study was collected using publicly accessible and reliable sources and will therefore take the form of quantitative, time series secondary data. Access to vast quantities of secondary data is available and this will enhance the depth and the quality of the study as a whole (Saunders & Lewis, 2012).

This research report has the aim to make a contribution to the existing knowledge on corporate finance through the following key distinguishing elements:

- No recent study was found within this context that reviewed the long-run performance of IPO events on the JSE.

- No study was found in the context of the JSE that included additional factors in the benchmark to ensure a more robust test result would be obtained.
- The incorporation of a Monte Carlo bootstrap simulation at the 5% level of significance. Other studies typically only incorporate much simpler models such as the market model and the CAPM.

4.2 Unit of analysis

The unit of analysis has been determined to be the daily closing share price of companies that conducted an IPO during the period under review.

The event was the date that the IPO firm went public, with the daily closing share prices being the quantitative, time series secondary data used in the study.

4.3 Population

The population was defined as all IPOs that took place within the ALSI on the JSE from January 2006 to May 2016.

4.4 Sample size

The study included all new listings in ALSI of the JSE from January 2006 to May 2016. The ALSI represents approximately 160 of the listed firms on the JSE and includes approximately 99% of the market capitalisation of the JSE. The period was chosen as it provided recent data in a South African context as well as to provide a sufficient period for time series data.

The population contains 48 IPOs in accordance with the scope set out above and the spread is set out as follows:

Table 4: Number of IPOs per year

Year	Number of IPOs
2006	3
2007	7
2008	5
2009	2
2010	6
2011	6
2012	5
2013	4
2014	6
2015	4
Total	48

The data on IPO events, their size, their subsequent performance and all relevant detail relating to their underwriters is public knowledge and is available to all parties simultaneously. Therefore, the entire market is able to react to the information at the same time to ensure that the returns can be easily observable.

4.5 Research instrument

The selection of the most appropriate measurement technique to determine the long-run performance of an IPO event as well as determining the most appropriate benchmark were some of the most important elements in the study conducted. The literature review indicated that the benchmark plays an important role in the determination of the long-run performance.

A market model, a single parameter CAPM and a 12 parameter control portfolio (or “style”) model were used as the measurement techniques to determine abnormal returns. These techniques, or similar versions thereof, are widely used and accepted. The benchmark used was the ALSI for the market model and CAPM and the abnormal returns were accumulated over the period under review. The ALSI contains a diverse composition of shares and therefore it was possible to contrast the performance of different firms against this benchmark.

4.6 Data collection and analysis

The complete list of all new IPOs on the JSE was extracted from the monthly JSE Bulletin which is publicly available. The list was reviewed for completeness and accuracy. The information that was extracted included the name of the firm, the JSE stock code, the event date, the number of shares traded publicly and the listing price per share.

The complete list of IPOs listed during the period was then reduced to only include the firms that forms part of the J203. This was done by comparing the share code of the IPO firm to the J203 index as per the JSE Bulletin. The resulting list was a complete list of IPO firms that was included in the ALSI.

The daily share price data was downloaded from Google Finance, INET BFA or Osiris as these are accepted as reliable and accurate sources of secondary data. The closing share prices are net of a dividend declared on a specific date and to correct the daily share price for the impact of dividends, the dividends per share was extracted from the JSE Bulletin and added to the ex-dividend share price on the appropriate date. Should this adjustment not be made, it could result in observable abnormal returns as this event only impacted the firm and not the market as a whole.

The performance data of the ALSI was obtained from the JSE Bulletin and this was used as the benchmark of the three models used in this study.

The CAPM requires that the market return be adjusted with the event firm's beta and the source of the beta was the JSE Bulletin. The beta was calculated after the event as the data is not available immediately after the event and was used post-hoc for the CAPM approach. The current beta of the firm is used as opposed to the listing beta or the average beta over the period while trading publicly as its deemed relevant to have the beta evolve over time with longer historical observable data being available.

As part of the literature review conducted, it was documented extensively that the method of analysis has a key impact on the results obtained. Traditionally, an accumulation of the Average Abnormal Returns ("AAR") using BHAR or CAPM is used as the method, yet there has been some criticism of the shortfalls of these methodologies.

4.6.1 Determining long-run performance

As discussed as part of the research metrics, three models were used to calculate and collect the abnormal returns of IPO firms. These are market model, a single parameter CAPM and a 12 parameter style model.

The market model involved calculating the difference between the return of the share and the return achieved by the market, being the return of the J203. A review of the work done by Kirkulak (2008), revealed the following applicable formulae:

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

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

Where:

$ar_{i,t}$ = The abnormal return using the market model

$r_{i,t}$ = The return of share i in month t

$r_{m,t}$ = The return of the market in event month t

The average market-adjusted return on a portfolio of n stocks (i.e. all IPO shares in the sample) for event month t is the average of the market-adjusted returns:

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

Where:

AR_t = The average market-adjusted return on a portfolio

n = All IPO shares in the sample

$ar_{i,t}$ = The market-adjusted return for stock i in event month t

The CAR from month q to month s is defined as:

$$CAR_{q,s} = \sum_{t=q}^{ns} AR_t$$

The CAPM includes the adjustments market for the share's systematic risk against the market with the unique beta coefficient of the firm itself. The resulting return is the return of the firm, with reference to the return of the market. The abnormal returns are then calculated as the difference between the expected return when using the market and the applicable beta and the actual return achieved by the firm.

The following formulae are applicable:

$$ar_{i,t} = r_{f,t} - \beta(r_{m,t} - r_{f,t}) - r_{i,t}$$

Where:

$ar_{i,t}$ = The abnormal return using the CAPM model

$r_{f,t}$ = The risk free rate

β = Beta coefficient of the share

$r_{m,t}$ = The return of the market in event month t

$r_{i,t}$ = The return of share i in month t

The average market-adjusted return on a portfolio of n stocks for event month t is the average of the market-adjusted returns:

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

Where:

AR_t = The average market-adjusted return on a portfolio

n = All IPO shares in the sample

$ar_{i,t}$ = The market-adjusted return for stock i in event month t

The CAR from month q to month s is defined as:

$$CAR_{q,s} = \sum_{t=q}^{ns} AR_t$$

The control portfolio model or style model has the purpose of responding to some of the criticisms and shortfalls of the market model and the CAPM. It is able to take into account additional factors noted in previous research papers and combines these with additional factors that are relevant when conducting a review on the JSE.

Ward & Muller (2010) document that their review of several of works of highly recognised scholars revealed that the shortfalls of the market model and the CAPM include the lack of consideration of the size of the firm as well as the growth of the firm. They further argue that when you conduct a study in a South African context, that the consideration of the firms as either resource or non-resource plays a key factor.

Ward & Muller (2010) developed a 12 parameter “style” model which represented the different cross-sectional factors of size, growth/value and resources/non-resources. Their control portfolios were made up as follows:

Table 5: Control Portfolios as per Ward & Muller (2010)

Control Portfolio	Resources or non-resources company	Value or growth company	Company Size
SGN	Non-resources	Growth	Small
SGR	Resources	Growth	Small
SVN	Non-resources	Value	Small
SVR	Resources	Value	Small
MGN	Non-resources	Growth	Medium
MGR	Resources	Growth	Medium
MVN	Non-resources	Value	Medium
MVR	Resources	Value	Medium
LGN	Non-resources	Growth	Large
LGR	Resources	Growth	Large
LVN	Non-resources	Value	Large
LVR	Resources	Value	Large

Ward & Muller (2010) classified each share on the JSE in the portfolio where it is most suitable with quarterly rebalancing of these portfolios ensure that any changes in the characteristics were taken into account appropriate reclassification as appropriate. Subsequent to the classification of shares into the control portfolios, daily equal-weighted indices were constructed using log returns.

Shares that delisted while forming a part of the portfolios were included until the date of delisting from the exchange. As the rebalancing of the portfolios takes place on a quarterly basis, delisted shares were assumed to have a zero return until the end of the quarter. New shares were included only from the beginning of the next quarter after listing on the exchange.

The following equation was used to develop the daily equal-weighted indices:

$$R_{it} = \log(P_{it}/P_{it-1})$$

Where:

R_{it} = the equal weighted share return for portfolio i for day t

P_{it} = the equal weighted share value of portfolio i at the end of day t .

The control portfolios of Ward & Muller (2010) measure the expected returns of the share taking into consideration the sensitivity of the share to the twelve control portfolios while taking into account alpha and beta coefficients through the specific regression equation listed below. The abnormal return is then calculated as the difference between expected return of the share taking into account the sensitivity to the control portfolios and the actual returns of the share.

$$E(R_{it}) = \alpha_{i,t} + \beta_{i,1}SGN_t + \beta_{i,2}SGR_t + \beta_{i,3}SVN_t + \beta_{i,4}SVR_t + \beta_{i,5}MGN_t + \beta_{i,6}MGR_t \\ + \beta_{i,7}MVN_t + \beta_{i,8}MVR_t + \beta_{i,9}LGN_t + \beta_{i,10}LGR_t + \beta_{i,11}LVN_t + \beta_{i,12}LVR_t$$

Where:

$E(R_{it})$ = the expected return on security i on day t ,

$\alpha_{i,t}$ = the alpha intercept term of security on day t ,

$\beta_{i,1} \dots \beta_{i,12}$ = the beta coefficients on each control portfolio return;

$SGN_t \dots SGR_t$ = the log-function share price returns on each of the twelve control portfolios set out in Table 1 on day t .

The average daily abnormal returns were calculated using the following equation:

$$AR_{it} = R_{it} - E(R_{it})$$

Where:

AR_{it} = the abnormal return of stock i on period t

R_{it} = the return of stock t

$E(R_{it})$ = the expected return using the above equation of stock i on period t

The sector, industry and underwriter of the firms were obtained from the JSE website (www.jse.co.za). The JSE website publishes the current underwriter and to ensure that the data is updated to reflect any changes in the underwriter since inception, retrospective adjustments were made. Any change in the underwriter of a firm was identified through inspection of the Stock Exchange News Service (“SENS”) announcements for the period since the firms have been trading publicly. A SENS announcement is public information subject to review and scrutiny by the market and is therefore determined to be a source of accurate, reliable and valid information for the purpose of the study.

4.6.2 Determining the effect of the quality of the underwriter on long-run performance

Using the results obtained from the work done on long-run performance, the data was disaggregated into portfolios of differing quality of underwriters.

Su & Bangassa (2011) determined the quality of an underwriter to be linked to their market share held as well as to the size of the capital raised, relative to the total capital

raised during a period under review. This was done in accordance with the work done by Megginson & Weiss (1991). These factors were used to disaggregate the full population of IPOs into smaller portfolios in order to determine whether there is a significant difference.

4.6.3 Determining the effect of the size of the offer on long-run performance

Using the results obtained from the work done on long-run performance, the data was disaggregated into portfolios of differing sizes of listings. The gross proceeds were calculated as the offer price per share multiplied by the number of shares issued.

4.7 Test for significance

The cumulative average abnormal returns (“CAARs”) in this study were tested for significance using a Monte Carlo bootstrap simulation. A simple t-test or analysis of variance was considered inappropriate as an assumption of normality would have to be appropriate (Ward & Muller, 2010). CAARs were calculated by accumulating AARs and this process therefore made the assumption of normality inappropriate. The Monte Carlo bootstrap simulation was created using random dates in the period under review which enabled the test for significance.

To create the Monte Carlo bootstrap, the following high-level steps were followed:

- The AARs were accumulated across each of the three testing models used in this research project to calculate the CAARs.
- Using random dates ($t + 780$) within the period under review, CAARs were determined and recorded. This process was effectively repeated one hundred times to arrive at a random event window.
- The resulting CAARs were reviewed and the appropriate record extracted to represent the 5th and 95th percentile, allowing to test up to a 5% level of significance.

- The actual event data CAARs were compared to the bootstrap simulation results and where the actual results fell outside of these confidence limits, the significant abnormal returns were found

4.8 Limitations

The research conducted as part of this report had certain limitations, including the following:

- The additional factors that are incorporated into the risk adjusted style model include the size of the firm, a value versus growth factor as well as an adjustment for the resource focussed Johannesburg Stock Exchange. Additional factors may yield varying results.
- The scope of the research excludes firms listed outside of the ALSI as well as firms listed on the AltX. These firms are smaller in size and research has shown that the long-run performance of larger and smaller firms is significantly different.
- The findings of the study are limited to the output derived from the methods used. Research has been conclusive in stating that the long-run performance of firms is sensitive to the method used. Applying different methods typically yield different results and conclusions.

5 RESULTS

5.1 Sample description

The long-run performance of IPOs was reviewed by calculating the CAARs using a market model, a single parameter CAPM and a style model. These tests were performed with the aim to review the primary objective of the research, with the results also being relevant to test the secondary research objectives. A detailed discussion on the relevance and validity of the data was done together with the findings.

The sample of 48 events was tested over the long-run period of up 36 months after the event date in order to calculate the CAARs. The table below presents a summary of the sample that was subject to the testing procedures described:

Table 6: Summary of event firms

Year	Number of listings	Gross Proceeds ('000)	Gross Proceeds %	Active firms		Delisted firms	
				Number	%	Number	%
2006	3	R 34 455 100	11%	3	100%	0	0%
2007	7	R 19 183 473	6%	6	86%	1	14%
2008	5	R 6 141 811	2%	5	100%	0	0%
2009	2	R 78 883 531	25%	2	100%	0	0%
2010	6	R 36 354 938	12%	3	50%	3	50%
2011	6	R 30 506 253	10%	5	83%	1	17%
2012	5	R 9 102 056	3%	3	60%	2	40%
2013	4	R 32 534 166	10%	4	100%	0	0%
2014	6	R 46 031 072	15%	5	83%	1	17%
2015	4	R 17 354 333	6%	4	100%	0	0%
Total	48	R 310 546 733	100%	40	83%	8	17%

5.2 Data validity

Saunders & Lewis (2012) describe a number of key factors that need to be taken into account in the assessment of the validity of data. Those key factors were extracted from the text and the following considerations were relevant in arriving at the conclusion that the data that was used in the research study was valid for the purposes intended.

Table 7: A table summarising the consideration of the validity of the data

Factors as per Saunders & Lewis (2012)	Consideration
Subject selection	All events were included for testing up to the point where the event reached the end of the 36 month period. Therefore there was a low risk of incorrect subject selection
History	Data was used from a public source with random bootstrap testing performed where relevant
Testing	All data was sourced from external independent reliable sources
Mortality	To avoid the risk of any survivorship bias, all events were kept in the sample up to the point where it was either delisted or where they reached the 36 month period of the study
Ambiguity regarding causal direction	The event date is a fixed and verifiable event and the returns achieved after the date of the event was analysed as part of the study

5.3 Data reliability

Saunders & Lewis (2012) further describe the considerations relative to data reliability. The data that was used in this research report was sourced from external independent reliable sources. Parties that seek to replicate the findings from the study would be able to source the same data from these sources. The information was collected directly from Google Finance, INET BFA, Osiris, SENS, JSE Bulletin and the JSE and was stored in electronic format. The risk of subject error, subject bias, observer error and observer bias is low due to the nature of the data and the collection method applied.

5.4 Hypothesis one: Long-run IPO performance

The daily share price data was analysed for firms that listed within the ALSI of the JSE between 2006 and 2016. The data was analysed from the event date for a period of 36 months and any firms that delisted during the period of the review, was retained in the sample to reduce the risk of a survival bias impacting the result.

The CAARs under the market model, CAPM and style model were presented in Table 8 and Figure 2 to follow. The result of the testing using the market model is presented in Figures 3 – 5, CAPM in Figures 6 – 8 and under the style model in Figures 9 – 13. The CAARs were presented in the y-axis and the time series on the x-axis for the period up to 36 months after the event date. In order to determine significance at the 5% level, a Monte Carlo bootstrap simulation was utilised and this is shown as a 95th percentile upper limit and a 5th percentile lower limit.

It was noted that under each model that both negative returns as well as positive returns are calculated during the period under review. At the end of the 36 month period, a positive CAAR was calculated under each of the models, ranging from an insignificant +1.3% under the style model to a significant +13.7% under the CAPM. The data show significant CAARs at many points throughout the period under review and the result at the end of the 36 month period are significant and positive under the market model as well as the CAPM and positive but insignificant under the style model.

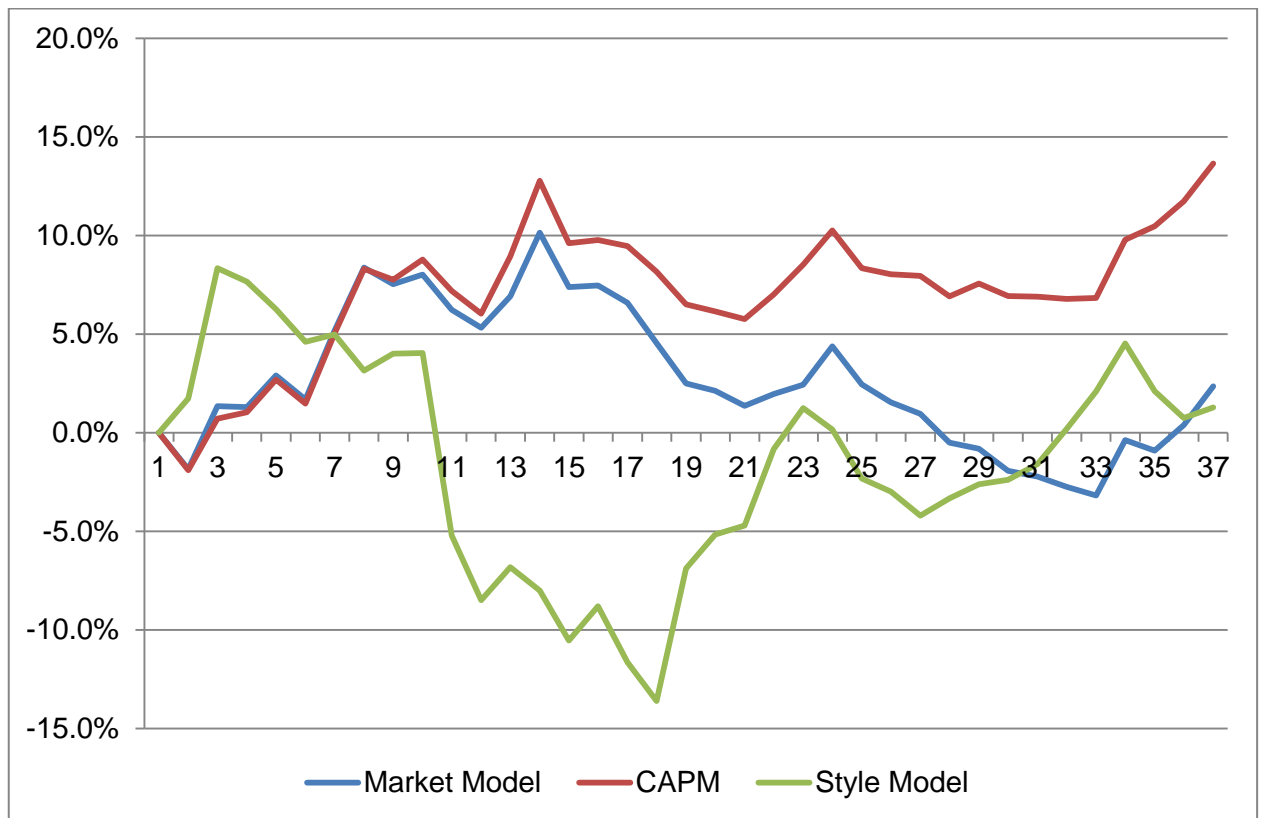


The table below and the following graph summarises the findings:

Table 8: Cumulative average abnormal returns

Month	Market Model	CAPM	Style Model
1	-1.9%	-1.9%	+1.7%
2	+1.4%	+0.7%	+8.3%
3	+1.3%	+1.0%	+7.7%
4	+2.9%	+2.7%	+6.3%
5	+1.7%	+1.4%	+4.6%
6	+5.2%	+5.0%	+5.0%
7	+8.4%	+8.3%	+3.2%
8	+7.5%	+7.8%	+4.0%
9	+8.0%	+8.8%	+4.1%
10	+6.2%	+7.2%	-5.2%
11	+5.3%	+6.0%	-8.5%
12	+6.9%	+8.9%	-6.8%
13	+10.1%	+12.8%	-8.0%
14	+7.4%	+9.6%	-10.5%
15	+7.5%	+9.8%	-8.8%
16	+6.6%	+9.5%	-11.6%
17	+4.6%	+8.2%	-13.6%
18	+2.5%	+6.5%	-6.9%
19	+2.1%	+6.2%	-5.2%
20	+1.4%	+5.8%	-4.7%
21	+2.0%	+7.0%	-0.8%
22	+2.4%	+8.5%	+1.3%
23	+4.4%	+10.3%	+0.2%
24	+2.5%	+8.4%	-2.3%
25	+1.5%	+8.0%	-3.0%
26	+1.0%	+8.0%	-4.2%
27	-0.5%	+6.9%	-3.3%
28	-0.8%	+7.6%	-2.6%
29	-1.9%	+6.9%	-2.4%
30	-2.2%	+6.9%	-1.6%
31	-2.7%	+6.8%	+0.2%
32	-3.2%	+6.8%	+2.1%
33	-0.4%	+9.8%	+4.5%
34	-0.9%	+10.5%	+2.1%
35	+0.4%	+11.7%	+0.8%
36	+2.4%	+13.7%	+1.3%

Figure 2: Graphical representation of CAARs under the various models



5.4.1 Market Model

The findings under the market model show that the CAARs are initially negative and insignificant at a 5% level of significance and gradually develop to a positive and significant level from day 132 onwards. During the latter part of the period under review, the CAARs become insignificant and negative. At the 36 month ending of the research study, the CAARs end at a positive and significant position.

The graphs below presents the average abnormal returns of the event firms over the 36 months as well as the standard deviation.

Figure 3: Average abnormal returns - market model

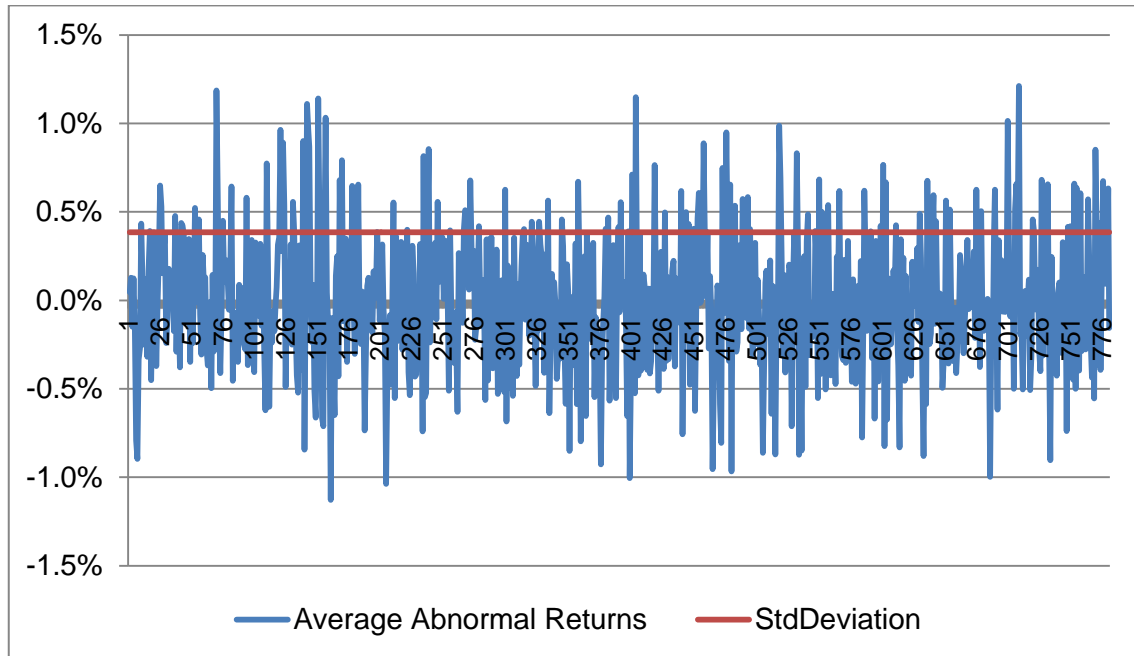


Figure 4: Spaghetti graph of the CAARs - market model

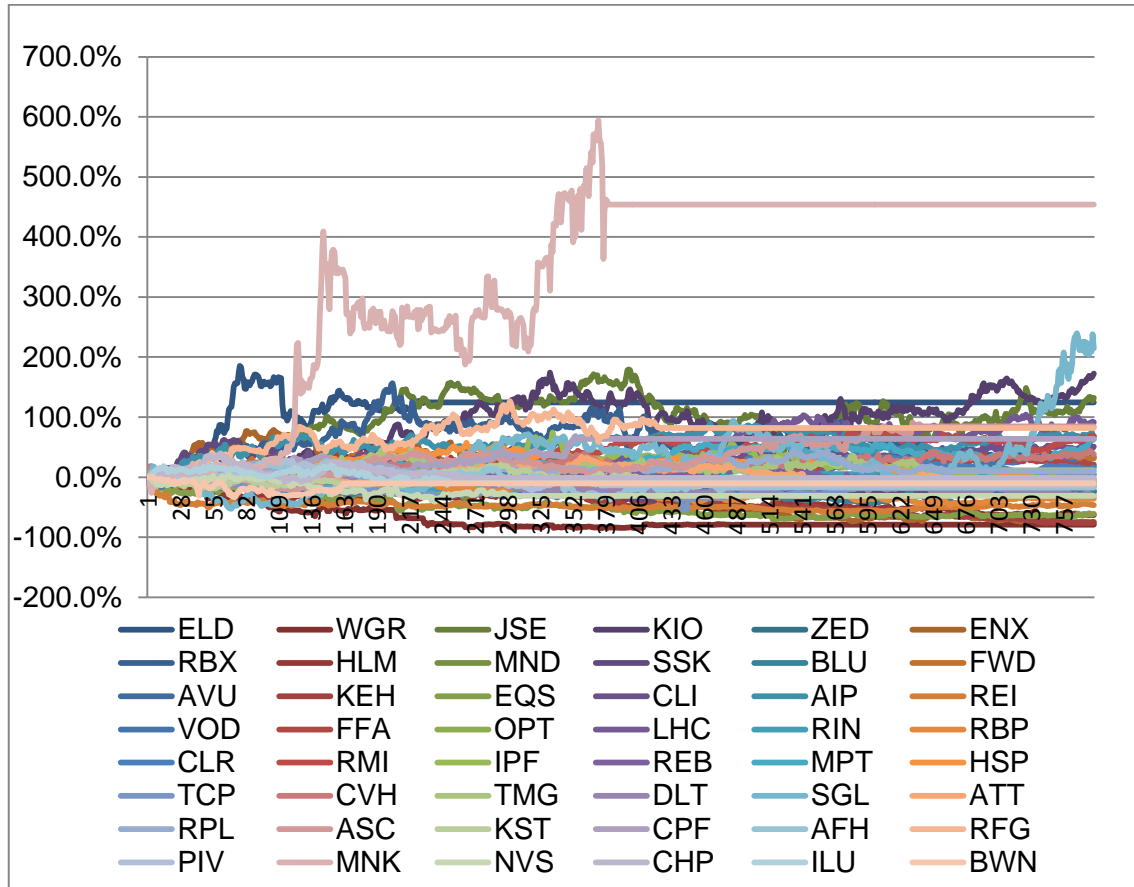
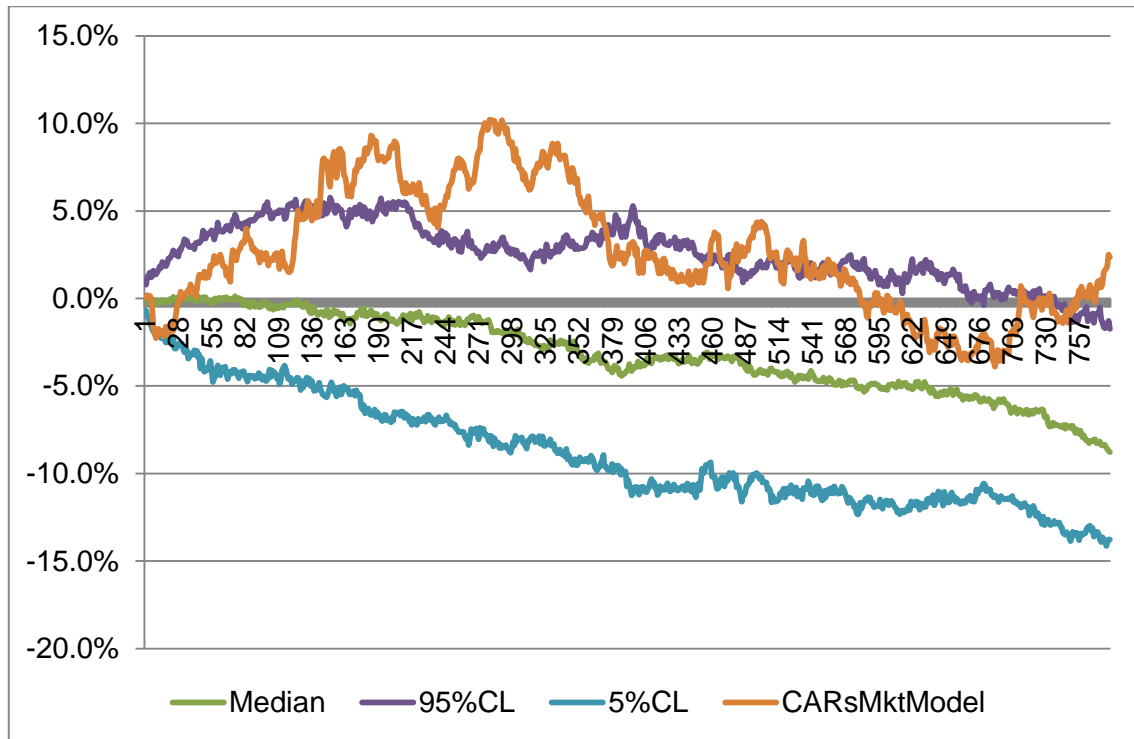


Figure 5: Graphical representation of the CAARs under the market model with the related confidence levels



5.4.2 CAPM

The findings under the CAPM show that the CAARs are initially negative and significant at a 5% level of significance. The CAARs gradually develop to a positive and insignificant level, with brief points being significant and positive. The most of the study resulted in insignificant positive returns, with the CAARs finally ending at a positive and significant position when the study concludes at 36 months after the event date.

Figure 6: Average abnormal returns - CAPM

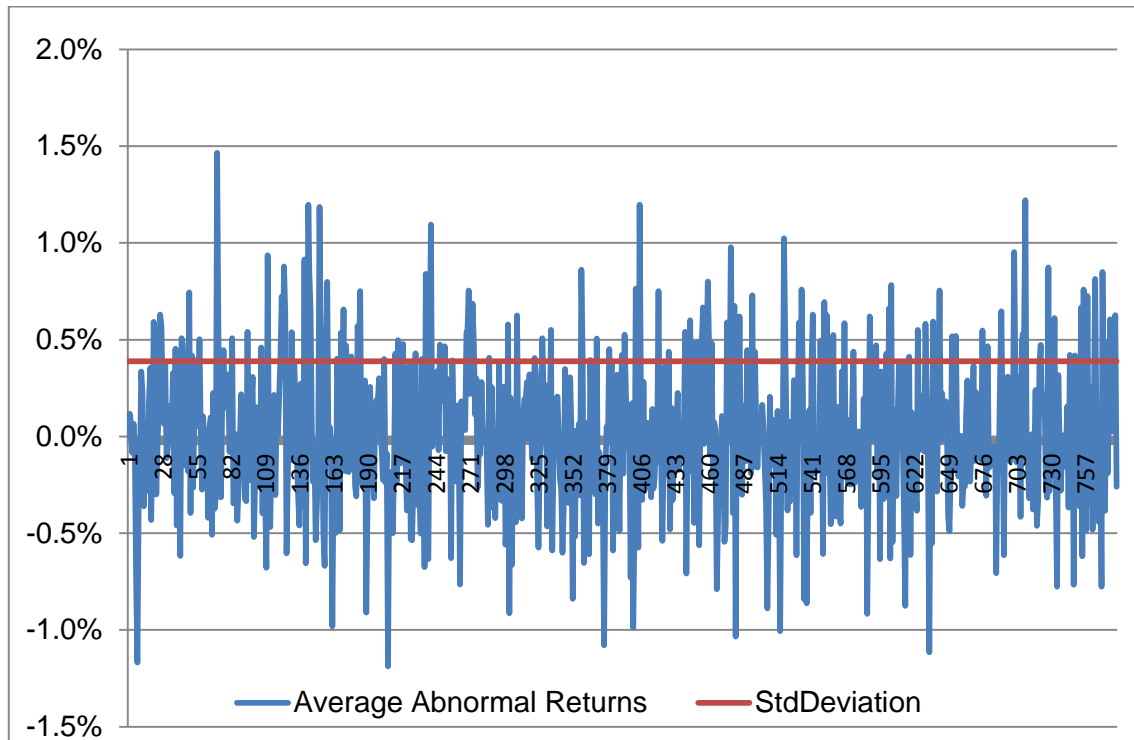


Figure 7: Spaghetti graph of the CAARs – CAPM

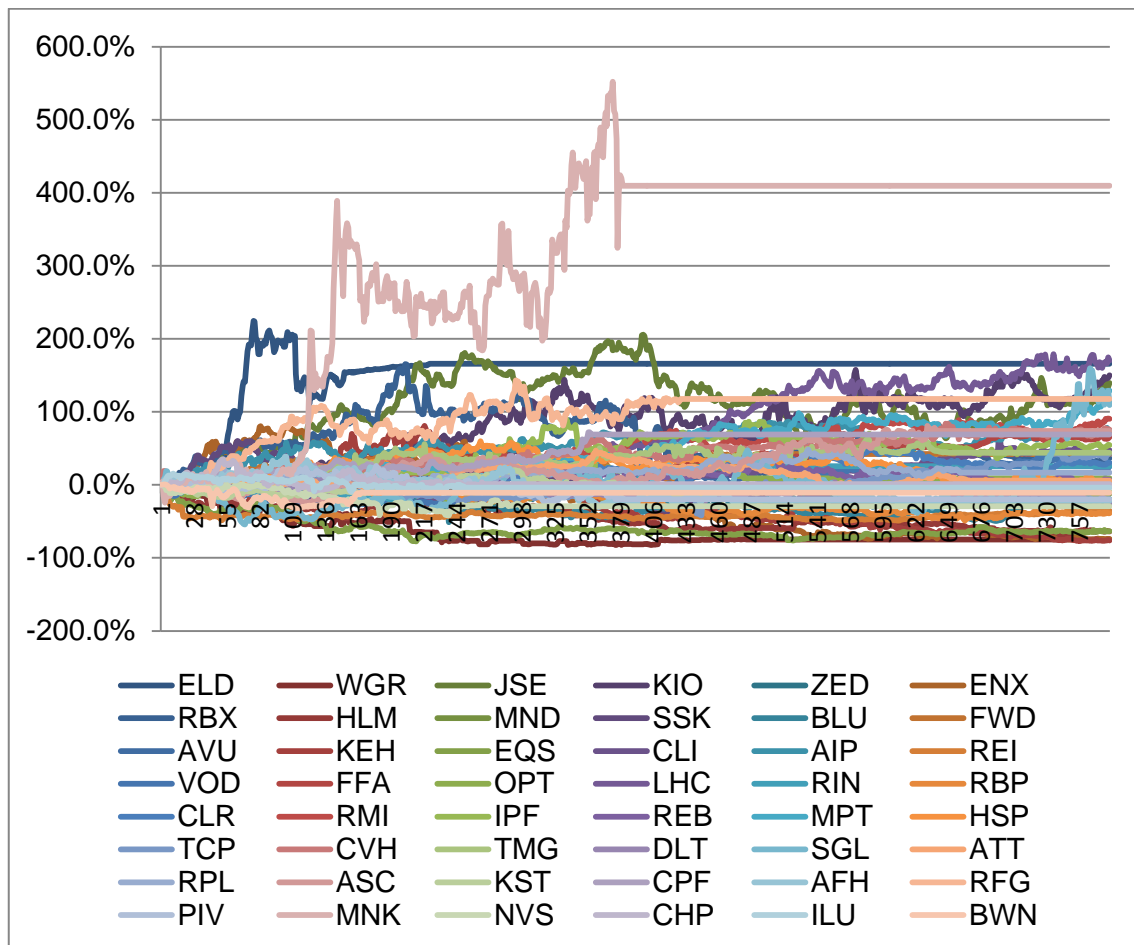
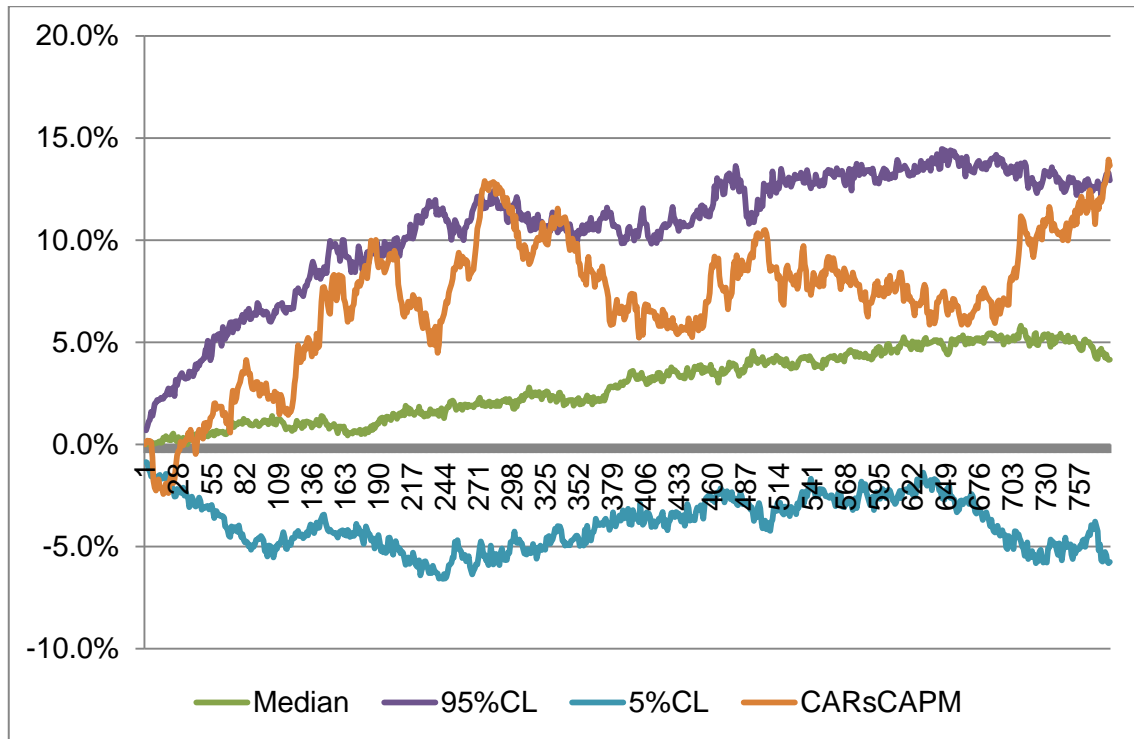


Figure 8: Graphical representation of the CAARs under the CAPM with the related confidence levels



5.4.3 Style model

The findings under the style model show that the CAARs are initially positive and fluctuate between being significant and insignificant at a 5% level of significance up to 106 days. For the balance of the period under review, the CAARs fluctuate between positive and negative, but always insignificant. Therefore, the significant positive returns that was achieved as part of the work done under the market model and the CAPM, disappears under the style model.

Figure 9: Average abnormal returns – Style model

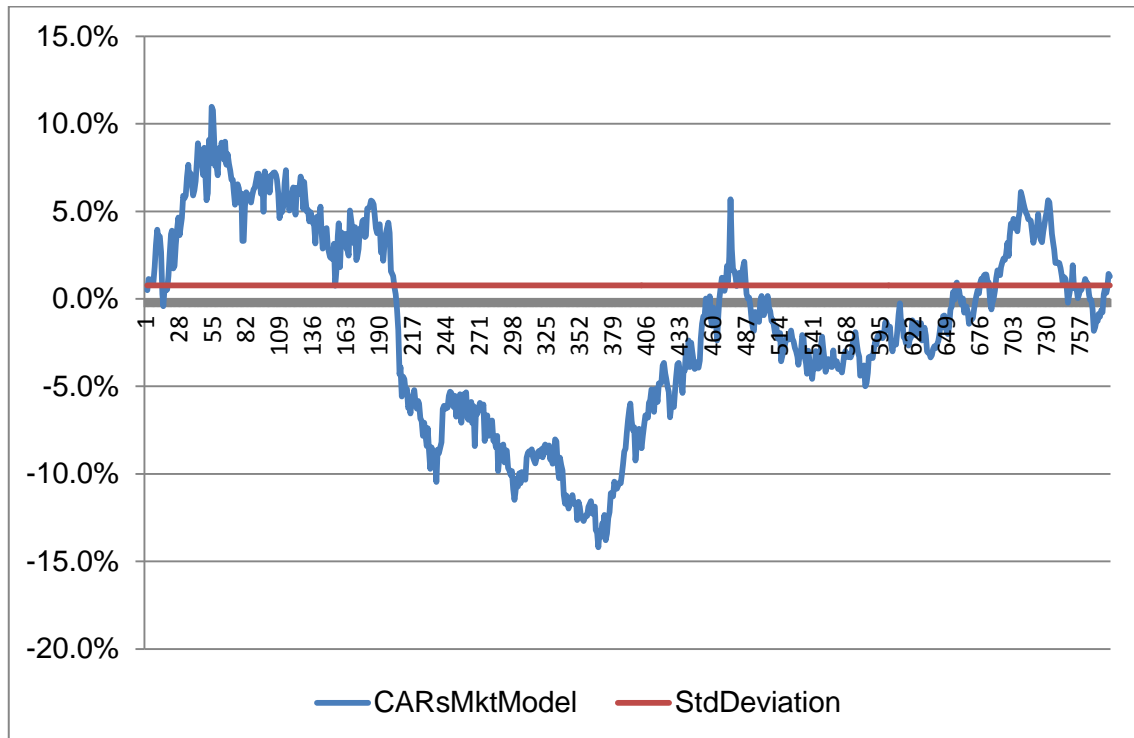


Figure 10: Spaghetti graph of the CAARs - Style model

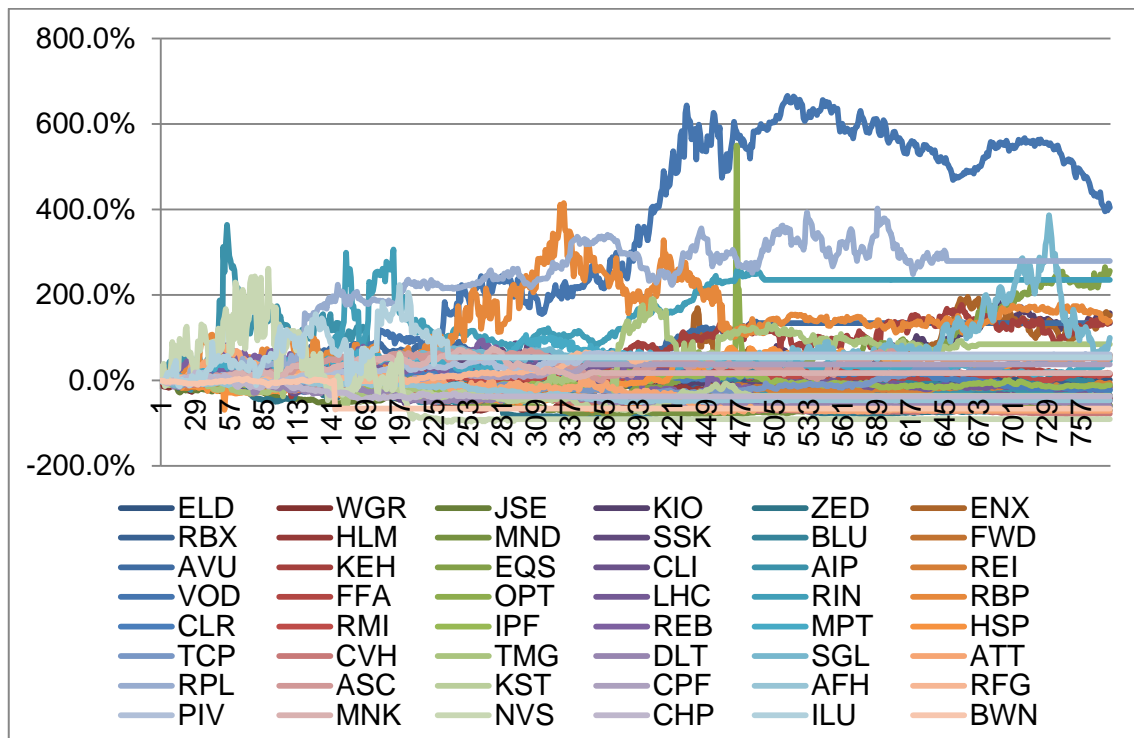
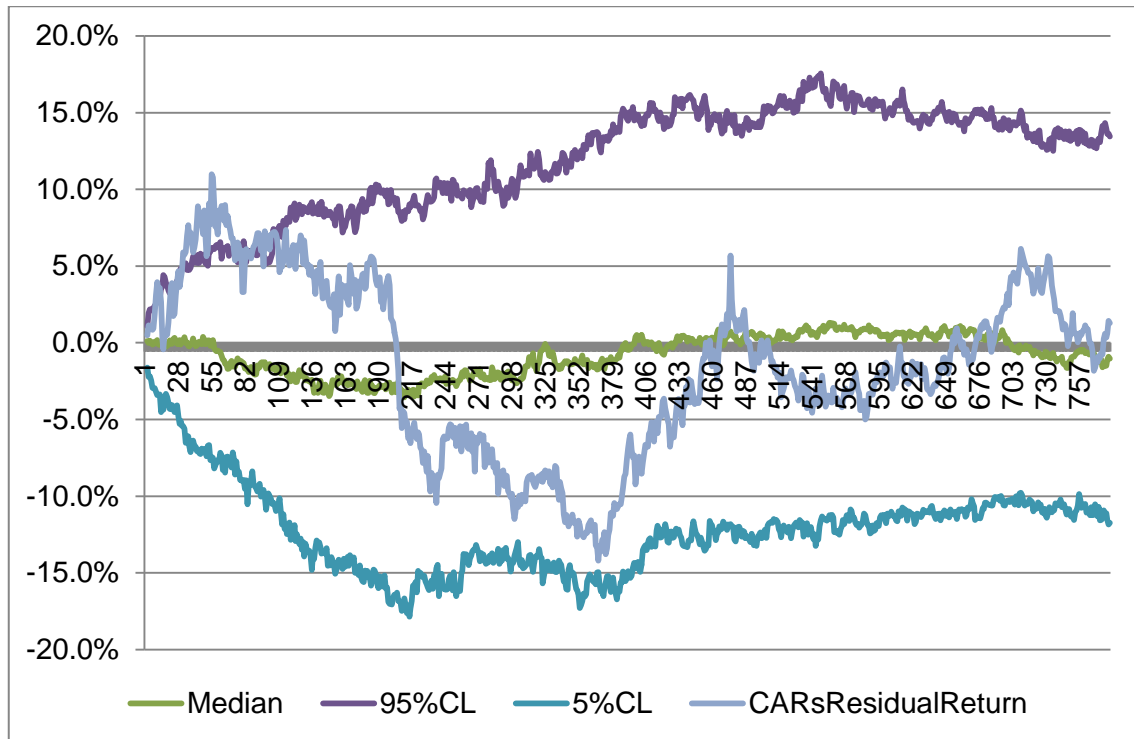


Figure 11: Graphical representation of the CAARs under the style model with the related confidence levels



5.4.4 Style model – expanded

A review was done with the style model data whereby event firms from 1990 up to 2016 were taken from firms included in the ALSI of the JSE. The data was weighed and rebalanced as per the methodology referred to in Chapter four. In addition to the style model, the data was placed in sub-categories with the following characteristics:

Table 9: Table indicating the categories analysed as part of the extended review

Category	Description
NewlyListed0	Contains firms listed for less than 1 year
NewlyListed1	Contains firms listed for less than 2 years and more than 1 year
NewlyListed2	Contains firms listed for less than 3 years and more than 2 year
NewlyListed3	Contains firms listed for less than 4 years and more than 3 year
NewlyListed4	Contains firms listed for less than 5 years and more than 4 year

The results indicate that firms underperform the benchmark during the first (NewlyListed0), second (NewlyListed1) and third year (NewlyListed2) after the event with the underperformance being most pronounced in the second year after the event. From year four (NewlyListed3) and onwards, the event firms seem to mature to a certain extent and start to lose their IPO behaviour displayed earlier in the period under review. Figures 12 and 13 graphically presents the performance noted.

The maturity of a firm seems to play a key role in the long-run performance of IPOs. The longer the firms seem to survive, develop and mature, the higher the favourable CAARs. A positive relationship between performance and the period traded was observed. The data suggests that investing in IPOs for the first three years after the event date does not generate sufficient return to justify taking the risk. Investing in an IPO firm that enters its fourth year after listing would be first time that an investor would be able to generate more favourable returns than the J203 on a risk adjusted basis.

Figure 12: Graphical representation of the long-run performance of event firms in various categories of time post the event date

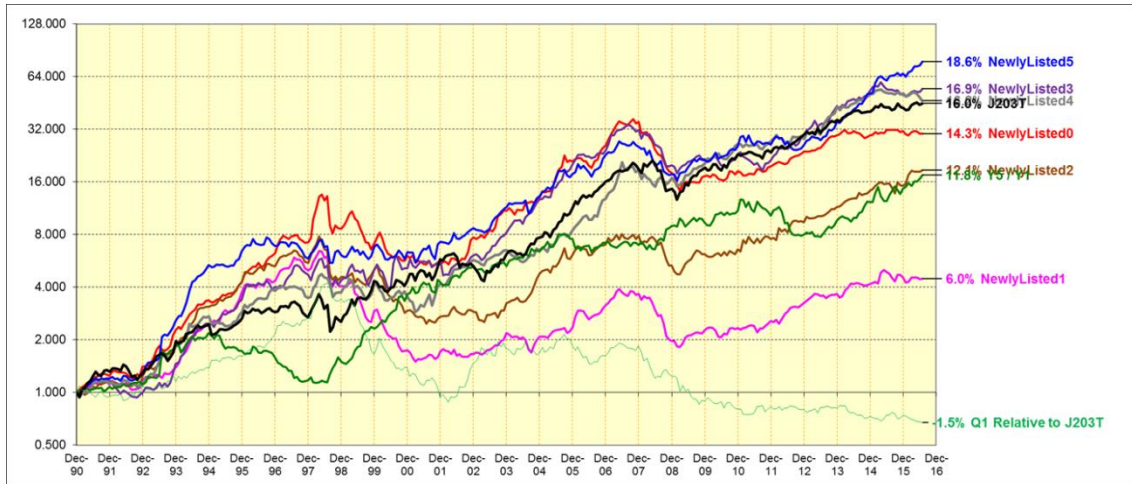
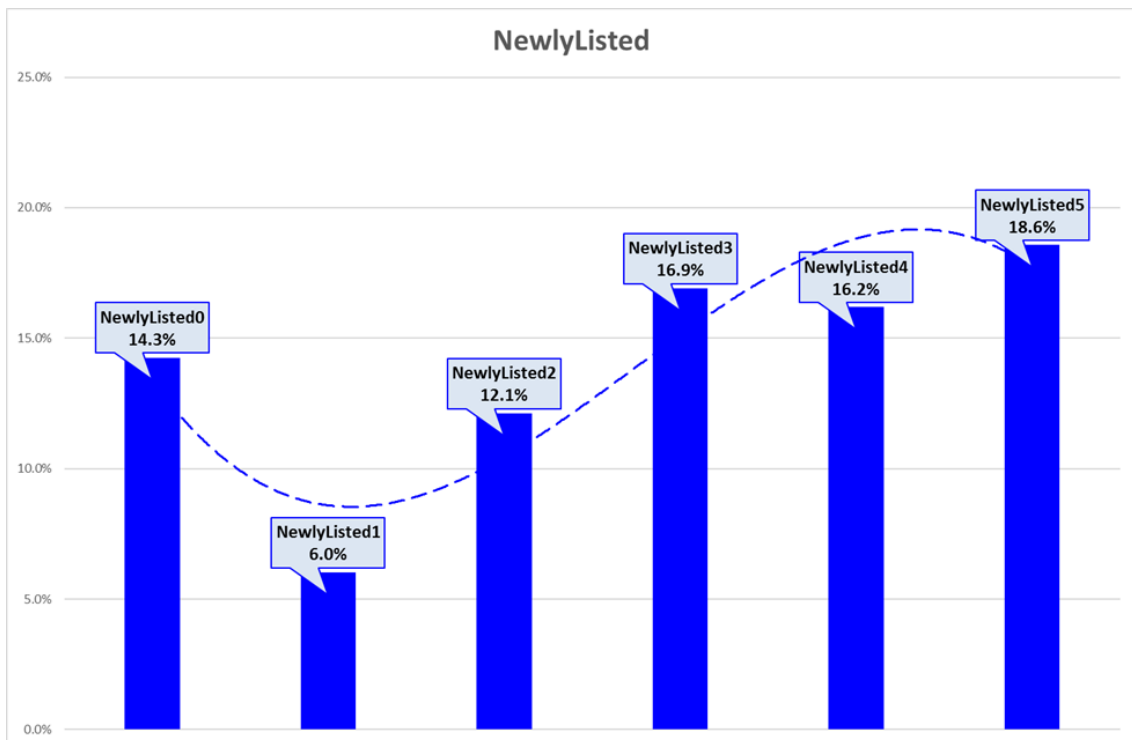


Figure 13: A histogram of the long-run performance of event firms in various categories of time post the event date



5.5 Hypothesis two: Underwriter quality

The daily share price data was analysed for firms that went public from 2006 to 2016. The data was analysed from the event date for a period of 36 months. From the 48 IPOs that was identified as part of the study, it was noted that the underwriter data was not available for 9 of the event firms and these were excluded from the testing performed. The balance of 39 firms were analysed to understand the long-run performance of IPO firms with reference to the quality of the underwriter engaged during the listing process.

The underwriter data was split into 2 categories with reference to the frequency of utilisation by the market, based on the work done by Su & Bangassa (2011) and Megginson & Weiss (1991). It was found that the three underwriters with the highest utilisation represented 72% of the sample, with the balance of the sample being represented by a further eight different underwriters. The CAARs under the market model, CAPM and a style model were presented in Tables 10 and 11 as well as Figure 14. The CAARs were presented on the y-axis and the time series on the x-axis up to 36 months after the event date. In order to determine significance at the 5% level, a Monte Carlo bootstrap simulation was utilised and this is shown as a 95th percentile upper limit and a 5th percentile lower limit.

The CAARs of firms engaging either prestigious or non-prestigious underwriters are for the largest part of the study negative and insignificant. The CAARs of firms engaging prestigious underwriters are initially positive and significant and develops into negative insignificant returns from approximately day 200 onwards. The CAARs of firms engaging non-prestigious underwriters are initially positive and significant and develop into negative returns that fluctuate between significant and insignificant. The study ends with both categories being negative and insignificant, with the CAARs of firms using non-prestigious underwriters being less negative than the CAARs of firms using prestigious underwriters.

It is therefore more favourable to utilise a non-prestigious underwriter than a prestigious underwriter under the style model in the long-run. However, in the short-run, a higher demand CAARs were generated by IPO firms engaging prestigious underwriters.

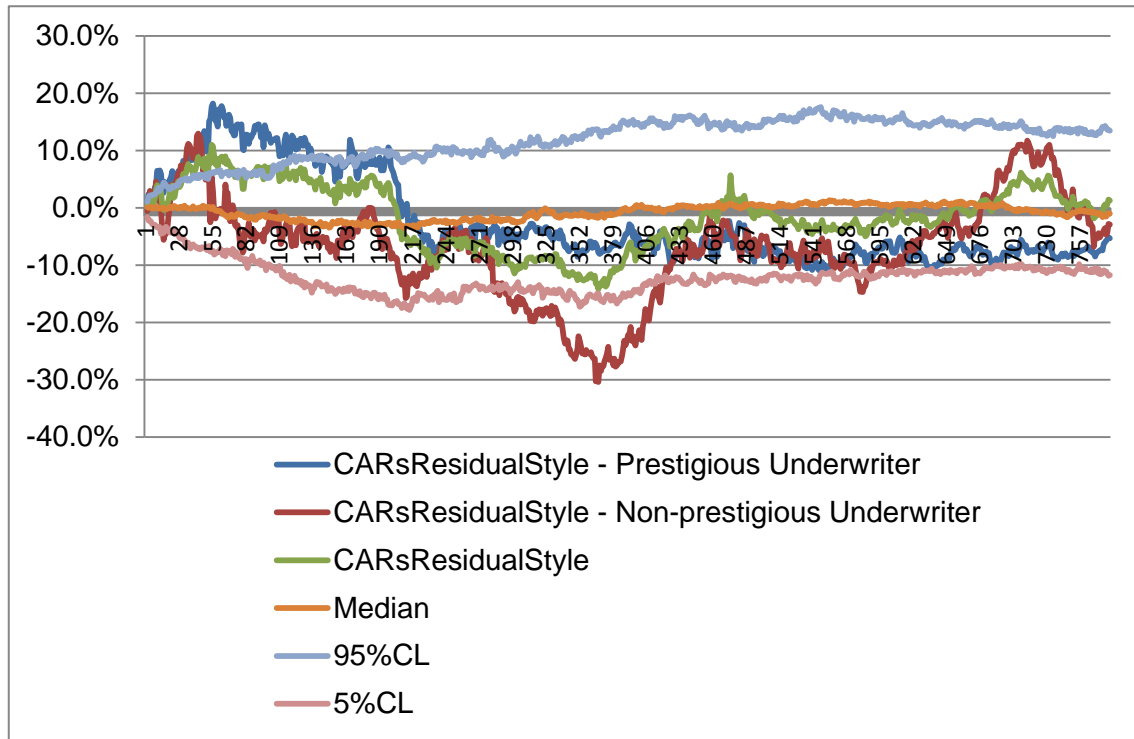
Table 10: Summary of the split of the quality of underwriters

Category	Number of underwriters	IPOs Underwritten	IPOs Underwritten
Prestigious Underwriter	3	28	72%
Non-Prestigious Underwriter	8	11	28%
Total	39	39	100%

Table 11: Summary of underwriters utilised

Category	Frequency	Frequency %
Rand Merchant Bank	14	36%
Java Capital Trustees & Sponsors	7	18%
Investec Bank	7	18%
UBS South Africa	3	8%
PSG Capital	2	5%
Bridge Capital Advisors	1	3%
PricewaterhouseCoopers Corporate Finance	1	3%
Merrill Lynch SA	1	3%
Deutsche Securities SA	1	3%
Nedbank Corporate & Investment Banking	1	3%
JP Morgan Equities	1	3%
Total	39	100%

Figure 14: Graphical representation of the CAARs - style model



5.6 Hypothesis three: Firm Size

The daily share price data was analysed for firms that went public from 2006 to 2016. The data was analysed from the event date for a period of 36 months. The gross proceeds were calculated by multiplying the number of shares listed with the listing price per share.

The data was split into 2 categories based on the size of the gross proceeds. The threshold utilised was that all listings with gross proceeds that exceeded R 500 million would be considered a large firm and that all firms with gross proceeds that was lower than R 500 million would be considered as non-large firms. It was found that 16 firms represented 81% of the total gross proceeds and these were categorised as large firms. The 32 firms representing 19% of the total gross proceeds were categorised as non-large firms. The CAARs under the style model was presented in Figure 15. The CAARs were presented on the y-axis and the time series on the x-axis up to 36 months

after the event date. In order to determine significance at the 5% level, a Monte Carlo bootstrap simulation was utilised and is shown as a 95th percentile upper limit and a 5th percentile lower limit.

It was noted that large firms tend to outperform non-large firms under the style model utilised as part of this study. The CAARs of large firms are always positive and significant while non-large firms fluctuating between positive and negative returns, but never significant.

The CAARs of large firms are somewhat volatile in the first part of the study, with brief moments of negative insignificant performance. The results are almost exclusively positive and from approximately 120 days become significant for the rest of the period under review. The CAARs of non-large firms are also volatile in the first part of the study, with periods of significant positive return, with negative returns from approximately 200 days after the event date fluctuating between being significant and insignificant. The CAARs of non-large event firms finally ends with being negative and insignificant at 36 months after the event date.

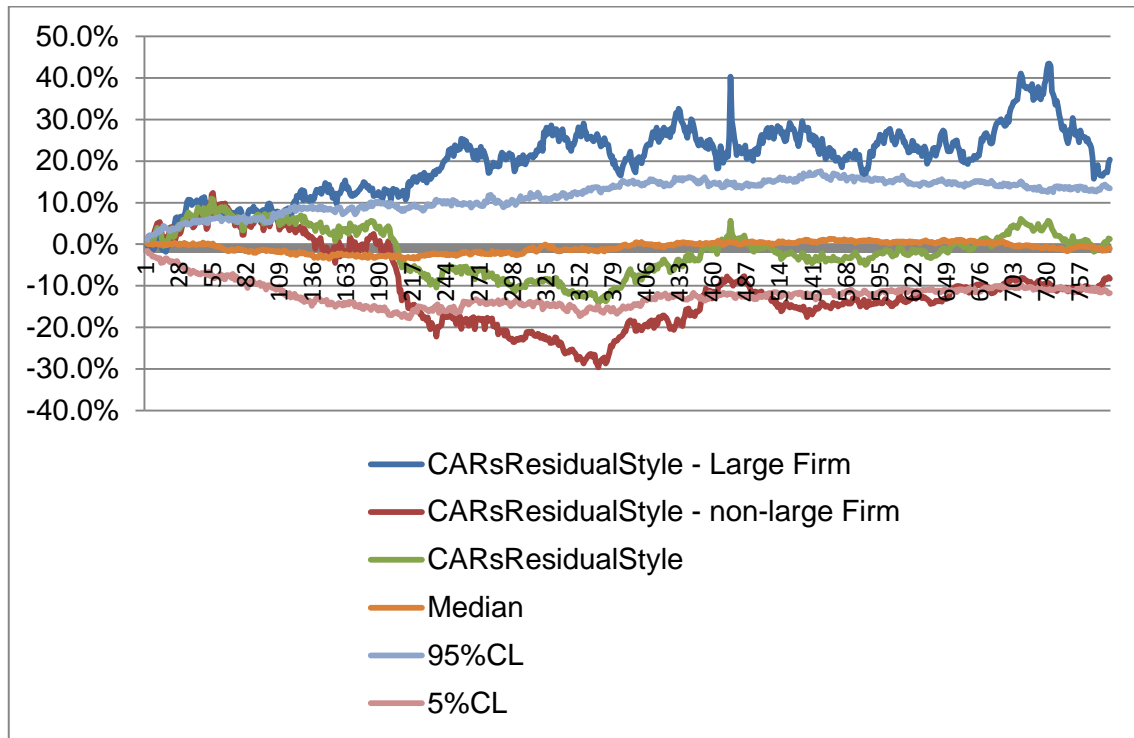
Larger firms tend to outperform non-large firms throughout the period under review, with the results of larger firms being that significant positive returns are presented.

Tables 12 below summarises the findings.

Table 12: Table of the gross proceeds of the event firms

Category	Number of firms	Gross Proceeds	Gross Proceeds
Large	16	R 252 171 318	81%
Non-large	32	R 58 375 414	19%
Total	48	R 310 546 733	100%

Figure 15: Graphical representation of the CAARs - style model



5.7 Conclusion

This section presents the conclusion relating to the CAARs achieved as well as whether these CAARs are significant at the 5% level when using a Monte Carlo bootstrap simulation.

The following conclusions can be derived from table 13 that follows:

- The positive and significant CAARs were found using the market model and the CAPM seems to disappear when a style model is used.
- At the end of the 36 month period, the CAARs of firms using either a prestigious firm or a non-prestigious firm are negative and insignificant.
- Large firms tend to produce significant positive returns and non-large firms negative insignificant returns.



Table 13: CAARs summary

Description	CAAR	Conclusion
Hypothesis one: Market model		
CAARs	+2.4%	Positive and significant
95%	-1.7%	
Median	-8.8%	
5%	-13.8%	
Hypothesis one: CAPM		
CAARs	+13.7%	Positive and significant
95%	+12.9%	
Median	+4.1%	
5%	-5.8%	
Hypothesis one: Style model		
CAARs	+1.3%	Positive and not significant
95%	+13.5%	
Median	-1.0%	
5%	-11.8%	
Hypothesis two: Style model		
CAARs - Prestigious firms	-5.3%	Negative and not significant
CAARs - Non-prestigious firms	-2.9%	Negative and not significant
95%	+13.5%	
Median	-1.0%	
5%	-11.8%	
Hypothesis three: Style model		
CAARs - Large firms	+20.3%	Positive and significant
CAARs - Non-large firms	-8.3%	Negative and not significant
95%	+13.5%	
Median	-1.0%	
5%	-11.8%	

6 DISCUSSION OF RESULTS

The primary objective of this chapter is the interpretation of the results that were obtained and documented in Chapter five. The results were interpreted with reference to the research problem and the related literature review conducted with the aim to be able to conclude on the hypotheses listed in Chapter three.

The table below summarises the hypotheses subject to testing as part of this research report:

Table 14: Summary of the hypotheses tested

Hypothesis	Description
H1₀	The abnormal returns of IPO firms using the market model, the Capital Asset Pricing Model and a style model are equal to zero.
H1_a	The abnormal returns of IPO firms using the market model, the Capital Asset Pricing Model and a style model are not equal to zero.
H2₀	There is no difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.
H2_a	There is a difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.
H3₀	There is no difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.
H3_a	There is a difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.

6.1 Hypothesis one

Hypothesis one involved determining the long-run performance of IPOs on the JSE using the market model, CAPM and a style model. The aim was to use the more traditional market model and CAPM to calculate the CAARs followed by a risk adjusted style model. It was be the primary aim to understand whether any significant CAARs that were found using the simpler models, either positive or negative, would disappear when a risk adjusted style model was used.

Ward and Muller (2010) noted that the market model and CAPM have been widely criticized as being too basic and that insufficient levels of risk adjustment are taken into account. The basic market model and the single parameter CAPM do not take into account factors such as the size of the company as well as the growth versus value factor. As part of this study, a style model was introduced that accounted for these factors as well as the impact of the resource focussed nature of the JSE.

The significant CAARs that were identified at the end of the 36 month period under review were consistent with most of the literature reviewed. The market model produced significant positive CAARs of +2.4%, with a maximum of up to +10.2% and a minimum as low as -3.9%. The CAPM revealed significant positive CAARs of +13.0% at 36 months, with a maximum of up to +14.0% at day 779 and a minimum as low as -2.4% at day 14.

The results obtained are consistent with the studies by Ritter (1991) and Loughran & Ritter (1995) as well as the work done by Page & Reyneke (1997) in a South African context. These studies are seen as important work on this topic and the alignment of the significant results found under this study serves as an important starting point in the interpretation of the results. Further, the alignment between the results obtained in this study and the work done in a South African context serves as a link between the literature review conducted and the results obtained.

Thomadakis, Nounis & Gounopoulos (2012), Cai, Liu & Mase (2008), Gregory, Guermat & Al-Shawawreh (2010), Chi, McWha & Young (2010), Su & Bengassa (2011), Levis (2011) and Bessler & Thies (2007) reported significant long-run abnormal returns when using either CAR or BHAR as the method. The findings of this report also align with these research reports in that significant CAARs were found 36 months after the event date. The finding of significant positive long-run performance in this study is different from the findings of these literature items which found negative results. The purpose of this study was not to determine whether either positive or negative returns would be found, but that the returns would be significant. A proposal for future research was made to understand the factors that would explain the positive significant CAARs found in the South African context which would be beneficial to investors and managers.

Carter, Dark, Floros and Sapp (2011), Ahmad-Zaluki, Campbell & Goodacre (2007) and Bessembinder & Zhang (2013) found significant abnormal returns when reviewing IPO events for a period of 36 months using either CAR or BHAR. These studies went further to review the long-run performance against a benchmark using a risk adjusted methodology to include factors such as the size of the listing and a growth versus value factor.

The CAARs under the risk adjusted style model revealed insignificant positive returns at 36 months after the event date. The CAARs were volatile in the early part of the period under review and stabilises 106 days after the event date with insignificant fluctuations between positive and negative returns. The findings of this research report is therefore consistent with the literature review in that the significant performance found at various points in past research studies as well as part of this research report, is largely dependent in the model used and the risk adjustment factors taken into account.

In a report by Basiewicz & Auret (2010), it was established that the Fama-French three-factor model was able to explain returns on the JSE. The research found that there are very few growth firms and that the market microstructure effects are one of the main reasons for the impact of the size effect. Further, the JSE is found to be less

liquid than the US stock exchanges and this also drives lower performance of smaller firms. The largest event firm with gross proceeds of R77 373 608 000, represented 98% of the gross proceeds of 2009 and 25% of the total gross proceeds of the sample. The top 10% of the sample represented over 50% of the gross proceeds, indicating that a few large firms represent a significant portion of the total gross proceeds for the period. Therefore, the size adjustments made as a result of the application of the style model played an important role in explaining CAARs.

The table below summarises the results obtained with reference to hypothesis one. The table indicates whether each of the tests were either rejected or failed to be rejected.

Table 15: Conclusion on hypothesis one

Hypothesis	Description
H1₀	The abnormal returns of IPO firms using the market model are equal to zero
H1₀ Conclusion	Reject the null hypothesis
H1_a	The abnormal returns of IPO firms using the market model are not equal to zero.
H1_a Conclusion	Fail to reject the alternative hypothesis
H1₀	The abnormal returns of IPO firms using the CAPM are equal to zero
H1₀ Conclusion	Reject the null hypothesis
H1_a	The abnormal returns of IPO firms using the CAPM are not equal to zero.
H1_a Conclusion	Fail to reject the alternative hypothesis
H1₀	The abnormal returns of IPO firms using a style model are equal to zero
H1₀ Conclusion	Fail to reject the null hypothesis
H1_a	The abnormal returns of IPO firms using a style model are not equal to zero.
H1_a Conclusion	Reject the alternative hypothesis
Overall conclusion	The significant abnormal returns found using the market model and the CAPM seems to disappear when using a risk adjusted style model.

6.2 Hypothesis two

The CAARs calculated as part of the research study revealed that event firms which elected to engage a prestigious underwriter generated positive significant returns of up to +18.2% 54 days after the event. The CAARs then fluctuate between being significant and insignificant up to day 197 and finally turns negative at day 207. The returns stay negative and insignificant up to 36 months where it ends with -5.3%. Firms that used non-prestigious underwriters achieved negative significant CAARs as low as -30.4% at day 366 which finally ends with negative insignificant CAARs of -2.9%.

Huang & Zhang (2011) suggested that the marketing efforts by underwriters around the initial offering play a vital role in the creation of demand and the issuance of the shares at a lower discount. The CAARs of prestigious and non-prestigious firms show that there are positive significant returns up to day 197 and therefore the findings of this research report align with the findings of Huang & Zhang (2011).

Dong, Michel and Pandes (2011), Su & Bangassa (2011) well as Chang, Chung & Lin (2010) suggested that there is a notable and positive relationship between the underwriter quality and the performance of an event firm. This study set out to understand whether the same patterns would be found on the JSE. The CAARs revealed that, for the most part of the 36 month period after the event date, that the performance of event firms using prestigious or non-prestigious firms are negative and insignificant. It also shows that the firms that utilised a non-prestigious firm outperformed firms that utilised prestigious firms, albeit still negative and insignificant.

To understand the findings made in this report which are contrary to those made in other parts of the world, the following factors may be relevant:

- The firms that are seen as prestigious in the South African context may not be prestigious in the international context. Some of the firms that were classified as non-prestigious firms in South Africa are large international firms and these

firms may in fact be highly prestigious firms with a limited footprint in the South African market. The firm that was used most frequently was a South African firm which represented 37% of the sampled tested. Other international firms were used less frequently.

The table below summarises the conclusion on hypothesis two

Table 16: Conclusion on hypothesis two

Hypothesis	Description
H2₀	There is no difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.
H2₀ Conclusion	Fail to reject the null hypothesis
H2_a	There is a difference in the abnormal returns of groups of IPO firms that use either prestigious or non-prestigious underwriters and the benchmark.
H2_a Conclusion	Reject the alternative hypothesis
Overall conclusion	Although differences between both the categories of underwriters and the benchmark were found, these were assessed to be insignificant.

6.3 Hypothesis three

The CAARs calculated in order to test hypothesis three revealed findings that are consistent with mainstream literature on this topic. Large firms outperformed non-large firms and yielded CAARs up to +43.4% at 731 days after the event day and finally ended with +20.3% at 36 months after the event date. The findings on large forms are both positive and significant. On non-large firms, the CAARs reach as low as – 29.6% at 366 days after the event date and finally reach an insignificant negative CAAR of - 8.3% at the end of 36 months.

The research published by Carter, Dark, Floros and Sapp (2011), Levis (2011), Gregory, Guermat and Al-Shawawreh (2010), Chi, McWha & Young (2010) and Page

& Reyneke (1997) proposed that larger firms tend to perform better than non-large firms with reference to long-run post IPO performance. The findings on this hypothesis support these findings and therefore similar conclusions can be reached in the South African context as what could be in other countries where similar research was conducted.

The table below summarises the conclusion on hypothesis three.

Table 17: Conclusion on hypothesis three

Hypothesis	Description
H3₀	There is no difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.
H3₀ Conclusion	Large firms: Reject the null hypothesis Non-large firms: Fail to reject the null hypothesis
H3_a	There is a difference in the abnormal returns of groups of IPO firms that are either large firms or non-large firms and the benchmark.
H3_a Conclusion	Large firms: Fail to reject the alternative hypothesis Non-large firms: Reject the alternative hypothesis
Overall conclusion	Large firms tend to outperform the benchmark significantly, while non-large firms generate negative returns, albeit insignificant.

7 CONCLUSION

The review of the long-run post-IPO performance has been documented extensively over the last few decades, with further research on risk adjusted benchmarks also being documented regularly. Similar studies in a South African context are rare and the concept of introducing a risk adjusted methodology to reviewing the long-run IPO performance was not found.

This research contributes to the existing literature in that a similar event study using such a robust risk adjusted style model is not available. Further, the inclusion of an element of the use of a prestigious underwriter as well as the review of large firms and non-large firms provides a broad scope of analysis in a volatile and emerging market context.

7.1 Principal findings

Significant long-run run CAARs of between +2.4% and +13.7% was found under the market model and CAPM respectively and this aligns with the key literature on the topic published by Ritter (1991) and Loughran & Ritter (1995). The introduction of a risk adjusted style model resulted in the significant long-run CAARs disappearing, which is consistent with the research conducted by Carter, Dark, Floros and Sapp (2011), Ahmad-Zaluki, Campbell & Goodacre (2007) and Bessembinder & Zhang (2013). These studies adjusted for the size of the listing as well as the growth versus value factor, with this study adjusting for these factors as well as the resource focussed JSE.

The result of the secondary objective of this report was that using either a prestigious underwriter or a non-prestigious underwriter yielded insignificant negative returns. It was also found that large firms yielded significant positive returns with non-large firms yielding insignificant negative returns at 36 months after the event date.

7.2 Implications for practitioners

The IPO characteristics of event firms are pronounced during the 36 months after the event date and these firms lose their IPO characteristics to mature from the fourth year after the event and onwards. Therefore, managers and investors should ensure that their expectations are realistic in that underperformance can be expected up to three years after the event date. Investors can also use this information to ensure that their strategy is aligned to the favourable CAARs that can be achieved from the fourth year after the event and that their investment activity may focus on only acquiring stakes in IPO firms from the fourth year onwards.

7.2.1 Managers

Although the long-run performance of IPO firms using either a prestigious underwriter or a non-prestigious underwriter yields negative insignificant returns at 36 months after the event, there are fluctuating returns during the period under review. Prestigious underwriters are able to generate more demand for the share in the short-run and this result in greater positive CAARs for a period over 200 days after the event. Managers can therefore create momentum and lower the risk of the total number of share made public not being taken up through the use of a prestigious underwriter.

7.2.2 Investors

The significant long-run CAARs that disappeared as part of introducing the risk adjusted benchmark to the analysis of this study can be linked to the size of the listing. The size of the listing is a key factor that was built into the style model used and when the CAARs of large event firms were presented separately from that of non-large firms it became clear that larger firms perform better than non-large firms. It would therefore be in the interest of investors to focus their investment strategy on larger firms as a higher yield can statistically be achieved.

7.3 Limitations of the research

Paragraph 4.8 of this report highlighted specific limitations of this study and the following additional limitations have been found as a result of the results of the study:

- The research was not designed to provide a detailed understanding of the key drivers of the long-run returns and therefore a limitation of this report is a clear understanding of the reason why this study found positive returns, while similar studies across the world as well as locally found negative significant returns.
- Due to the nature of the data, standard t-tests and analysis of variances (ANOVAs) could not be performed. This presents a limitation to the report in that the findings show that there are differences in the results of the various tests performed, yet it does not indicate whether these differences represent significant differences.

7.4 Suggestions for further research

This study looked at the long-run post-IPO performance of firms listing on the JSE which was included in the ALSI. Given the importance of an IPO event for the shareholders and managers of the firm, investors and for the broader economic environment, further research is warranted to develop the existing knowledge.

7.4.1 Factors influencing abnormal returns

The study found that IPO firms on the JSE yielded positive long-run returns. This stands in contrast with most of the research available that have conducted across the world as well as locally, where significant negative long-run returns were found. It would be a contribution to the current research should the factors that drive the South African economy and the JSE to yield such contrasting returns be explained.

7.4.2 Underwriters

Further research should look at categorising underwriters on an international platform or using the alternative benchmarks as noted by Megginson & Weiss (1991) to assess whether underwriters are prestigious or not. This will provide a further assessment of the impact of a quality underwriter on the IPO process in a South African context. The performance of event firms was reviewed with the categorisation between prestigious and non-prestigious being done on the frequency of use in a South African context.

7.4.3 Size of the listing

Future research should be conducted with the focus to disaggregate the size of the listing further to determine the critical size reached where negative CAARs disappear. Further, it would be beneficial to managers to be able to understand the size point where the greatest positive CAARs are generated as it could be used as a strategic planning input to the listing process.

7.5 Conclusion

This research report set out to understand whether the significant negative long-run post-IPO abnormal returns typically found in markets around the world would also be found in a South African context. The report started by using simpler models such as a market model and a single parameter CAPM and later introduced a risk adjusted style model as the third model used.

Significant positive abnormal returns were found using the simpler models. This finding aligns with popular literature in that the abnormal returns were significant, but stands in contrast in that the returns are positive as opposed to negative. Further, the introduction of the risk adjusted style model resulted in the disappearance of the significant abnormal returns which is also consistent with academic literature.

A secondary research objective included the understanding the involvement of a prestigious underwriter in the listing process. The results showed that involving either a prestigious underwriter or not, yield insignificant negative abnormal returns in the long-run. In addition to the above, a further secondary research objective looked at the size of the gross proceeds of the listing and the abnormal returns generated. Large firms yielded significant positive returns and outperformed non-large firms which yielded insignificant negative returns.

Event study methodology was used to conduct this study and the scope of the firms included were firms that went public from 2006 – 2016 on the JSE Main Board which were included in the J203. To determine the significance of the cumulative average abnormal returns, a Monte Carlo bootstrap simulation was used at the one per cent level of significance.

It is clear that factors such as the size of the listing is a key factor in the long-run performance of IPOs and investors can focus on large firms in order to yield positive abnormal returns. Further, prestigious underwriters yields positive returns in the short-run due to the increased marketing efforts, yet in the long-run both prestigious and other underwriters yield insignificant negative returns.

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APPENDIX A: Ethical Clearance

Dear Johan Wynand Snyman

Protocol Number: Temp2016-00851

Title: **The Long-run Performance of Initial Public Offerings in South Africa**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

Adele Bekker



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