INVESTORS DEMAND FOR IPO'S AND FIRST DAY PERFORMANCE:
Evidence from Nairobi Stock Exchange

BY

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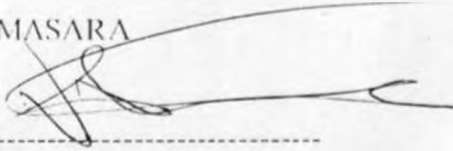
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DEDICATION

I dedicate this paper to my family. Your faith in me has shaped my character and has made me to have faith in myself. Thanks to our almighty GOD for his blessings in our family.

ACKNOWLEDGEMENTS

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ABSTRACT

This study analyses the initial returns of initial public offerings (IPOs) using a sample of companies listed in the Nairobi Stock Exchange during the period 1984 to 2008. It further relates the initial return to subscription rate using regression models to establish whether relationship exists and the nature of the relationship. The study provides one emerging market case of international evidence on performance of IPOs.

The findings from the sampled IPO firms show an average initial return of 40.28% on the first day of trading in the secondary market. This represents 17.78% increase when compared with study by Maina (2004) when he found initial return of 22.57%. All this is consistent with other international research, which have on average also documented first day positive initial returns. See appendix 5.

The study further found out that average subscription rate stands at 291.08% which shows an increase of 62.30% as compared to 228.78% in a study by Maina (2004). The highest subscription rate to date is 800% achieved during Eveready IPO offer. The lowest subscription rate was in Mumias IPO offer at 60%. The results also compares favorably to findings by Summit Agarwal (2003) in Hong Kong market when they found average subscription rate of 90%.

The study also found out that Quadratic regression model best represents the nature of relationship between initial return and subscription rate when compared with results generated by linear regression model in the Kenyan IPO market.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Gaining an understanding of direction of price change in stock markets and how those changes take place especially upon listing of IPO offer at stock market has very important implications for investors. If a rational investor gets a way of knowing how prices will behave before hand, he would make his investment decisions in such a way as to consistently outperform the other investors. Initial public offerings (IPO's) of common stock, on average have been found to earn abnormally high initial returns in general. Among studies advancing above view point include, [Ibbotson (1975), Ritter (1984), Loughran, et al (1994)]. It is also well known that IPO firms significantly under perform the market in the long run (three to five years) following the offering date [Aggarwal and Rivoli (1990), Loughran (1995), Maina (2004), Ritter (1995, 1997), and Brav and Gompers (1997)]. This IPO return phenomenon is observed in stock markets around the world. According to Ritter (1991), the relationship between the long-run underperformance to the short-run under pricing phenomenon is an unresolved mystery in the IPO literature. Although these puzzling occurrences have prompted substantial research to investigate the causes of IPO under pricing, we know very little about why some IPO's are under priced while others are not. From past studies, it has been found that the IPO's with high investor demand (subscription rate) have large positive initial returns, while the IPO's with low investor demand (subscription rate) have low or even negative initial returns Summit Aggarwal (2003).

Several recent studies have looked at the relationship between investor demand for IPO's and aftermarket performance of the IPO firms. Hanley (1993) in her study found out a positive relationship between investor demand and the first day trading performance of IPO's. Kandel, et al (1999) also documents a positive relationship between the IPO demand and the abnormal return on the first trading day for a small (27 IPO's) sample of Israeli IPO's. An interesting finding in their paper is that the

above relationship holds even when the prices of IPO's are totally determined by investors rather than issuers or underwriters. This is possible because IPO's in Israel are conducted as nondiscriminatory auctions with a minimum price but not a maximum price. This under pricing phenomenon cannot be explained by existing rational expectation models. Hence, one interpretation of the above finding is evidence that investor demand may contain information about the quality of IPO's. The positive relationship between the demand of IPO's prior to offerings and their post-market abnormal returns is also documented in Taiwan stock market by Liaw, et al (2000). They analyzed 52 Taiwanese IPO's that were conducted as discriminatory auctions between December 1995 and October 1998.

However, not all IPOs are severely underpriced. In a study by Summit Agarwal (2003), they found that the low-demand IPOs earn negative initial returns of –6.67 percent, implying that those IPOs are actually overpriced. While there is a consensus that average initial underpricing should and does exist in the IPO market, the aftermarket performance provides conflicting findings with some studies indicating negative or even zero aftermarket performance. In an early study, Ibbotson (1975) its findings does not reject the hypothesis that the abnormal returns in the aftermarket are zero. Negative aftermarket returns for IPOs have been reported by Ritter (1991), Aggarwal and Rivoli (1990), and Loughran and Ritter (1995).

Further evidence of negative first day returns are also documented by Ritter (1998) who noted in the U.S. that one in eleven IPOs had a negative initial return, and one in six closed on the first day at the offer price, which means it realised a nil return. Others who have again noted negative initial return in their studies include Ibbotson, Sindelar, and Ritter (1994) who analysed U.S. IPOs for the period 1960 to 1996 involving 13,308 IPO firms. The lowest negative initial return noted was -0.7% while the highest negative return was -17.8%.

In Kenyan market, a study by Maina (2004), found out that the average first day initial return was 22.57% using a sample of 14 IPOs. The highest initial return was that of Standard Chartered bank at 72% while the lowest with negative return was of

Athi River with negative -26.12%. The Athi River shares were offered at kshs 12.25 but at close of trading during the first day, it traded at kshs 9.05 thus realising a negative return. Mumias share offer recorded nil return on the first day performance since the offer price of kshs 6.25 was also the first day closing price.

Another observation made by Maina (2004) from the 14 companies studied was wide variations in subscription of IPOs in Kenya with Barclays Bank of Kenya recording then the highest subscription rate of 613% and Mumias the lowest subscription rate of 60%. This shows that the Kenyan market has good response for IPOs being floated. A study done in Hong Kong market by Summit Agarwal (2003) found out cross-sectional regression results showing that the subscription ratio is a moderate predictor of initial returns. The conclusion from their study in Hong Kong market, which is an emerging market like ours showed that every unit increase in the subscription ratio contributes to, on average, a 0.18 percent increase in initial returns. The positive relationship between investor demand and IPO initial returns is consistent with the results in Hanley (1993), Kandel, et al (1999), and Liaw, et al (2000)

Understanding IPO pricing and initial return behavior is important at this point in time as many Kenyans are now keen in investing in stock market. For instance the recently concluded Safaricom offer witnessed a high subscription rate of 532 %. An additional ten billion shares were sold to both retail and institutional investors. This became the largest IPO offer in Kenyan IPO market. With Safaricom shares starting to trade it pushed the market capitalization to over a 1.23 trillion from a figure of 916 billion before the offer. As the economy continues to gain momentum the need for investment funds will most likely increase. The role of the NSE as an avenue to raise investment capital will be on spotlight. Currently, Cooperative bank is preparing to float its shares at NSE by October 2008. This signals that IPO market is gaining momentum in Kenya and the need for updated information on the IPO market performance cannot be underscored.

1.2 Statement of the Research problem

The IPO markets around the world as discussed above manifest different behaviors regarding the IPO first day returns performance. It is also noted that varying subscription rates have been observed in IPOs around the world. In the Kenyan market the highest first day initial return recorded so far is 72% in the Standard Chartered Bank offer while the lowest recorded initial return is negative -26.12% as shown by Athi River share offer. According to findings by Maina (2004), using a sample of 14 firms, his average initial return was found to be 22.57%. Since then more IPO firms have been listed in NSE. These are Scan group which floated 69 million shares, Equity bank floated 90 million shares. Access Kenya floated 80 million shares. Eveready 63 million shares floated, Kengen floated 659 million shares. Kenya Re floated 240 million shares and lastly Safaricom which floated 10 billion shares. From the above subsequent floatation of shares at NSE after above study by Maina (2004), it is important to revisit the computation of first day return in light of the above new offers which again have impacted in the market capitalization which has now exceeded the one trillion mark. The largest offer of kshs 10 billion shares was recorded in the just concluded Safaricom IPO.

IPO subscription rates realized in the Kenyan market have fluctuated greatly over the years. By the time Maina (2004) was carrying out his study, the highest subscription rate recorded then was 613% in Standard Chartered Bank Issue and lowest subscription rate was 60% in the Mumias shares offer. Since then, more new issues have been floated and which have recorded various subscription rates. According to data from Nairobi stock Exchange, the Eveready offer recorded the highest subscription rate of 800%. This becomes the highest rate achieved in the Kenyan market to date. Safaricom offer recorded a 532% subscription rate. Scan group recorded a 500% subscription rate. Kenya Re a 405% subscription rate and Kengen a 337% subscription rate. The above occurrences at NSE, calls for a more current study to establish the position of IPO performance. Again in view that the Kenyan market has witnessed positive initial returns, nil initial returns and even negative initial returns, it is necessary to carry out this research at this point in time to establish the

current first day performance and to determine if a relationship exists between initial returns and subscription rates realized in the NSE market.

Other studies have found that the level of investor demand and the initial return are associated (Ross 1990 & Ritter 1987). In those studies it is argued that the pricing phenomenon of initial public offering is the chief factor that explains the investor demand as shown by subscription rate. The study by Maina (2004) looked at initial performance of IPOs at NSE. This study is different from above study by Maina (2004) because other than establishing the current initial return performance at NSE in light of new IPO listings, it further relates investor demand to initial return. The study is necessary at this point because it uses more recent data and it is also important to provide investors and general public with the most up to date performance results of our stock market.

1.3 Objective of the study

The study had two objectives:
1. To establish the initial first day performance at NSE using recent data.
2. To investigate whether there exists a relationship between the demand for IPO's and first day performance.

1.4 Justification for the study

The findings of this study are important and useful to the following groups:

1) To companies

The study is beneficial to private and public companies in Kenya that may be considering listing their shares at the Nairobi Stock exchange. It helps them to make their investment decision from informed point of view in relation to IPO performance in Kenya.

2) To investors

The study is useful to investors in seeing the relationship between subscription rate and offer price and can make their decision from informed perspective. For example if the findings of the study shows that those shares oversubscribed are always under priced will enable investors make up their mind when to invest.

3) To Academicians and Researchers

Academics and researchers are able to be informed on the current relationship between offer price and subscription rate in the Kenyan set up (environment) which can enable them to do further tests in future to confirm or refute the current position.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Background

From literature on IPO's, under pricing is a common phenomenon. The under pricing is inferred from the initial abnormal return. Prior works on initial public offering (Ritter, 1991; Welch and Ritter, 2002) report evidence that the initial public offerings in several countries are under priced. For example, Welch and Ritter (2002) reports that based on a sample of IPO's in U.S. between 1980 and 2001, the average initial return of IPO's are 18.6 percent. A study of IPO's in UK by Levis (1993) shows that, based on a sample of 712 IPO's in UK in 1980-1988, average initial return is 14.3 percent. Aggarwal (1994) study of IPO's in Switzerland report that IPO's are under priced using a sample of 42 Swiss IPO's from 1983 to 1989. Consistent with prior results, Drobetz et al. (2005) report that average initial return for a sample of Swiss initial public offerings from 1983 to 2000 is 34.97 percent. For IPO's in Israel between 1989 and 1993 average initial return is 11.99 percent.

However, not all IPO's are severely underpriced. In a study by Summit Agarwal (2003), they found that the low-demand IPOs earn negative initial returns of –6.67 percent, implying that those IPOs are actually overpriced. While there is a consensus that average initial underpricing should and does exist in the IPO market, the aftermarket performance provides conflicting findings with some studies indicating negative or even zero aftermarket performance. In an early study, Ibbotson (1975) does not reject the hypothesis that the abnormal returns in the aftermarket are zero. Negative aftermarket returns for IPOs have been reported by Ritter (1991), Aggarwal and Rivoli (1990), Loughran and Ritter (1995), Levis (1993), Aggarwal, Leal and Hernandez (1993), and Firth (1997).

According to Ritter (1998) noted in the U.S. that one in eleven IPOs had a negative initial return, and one in six closed on the first day at the offer price. One in a hundred

doubles on the first day. Further findings on negative initial return according to Ibbotson, Sindelar, and Ritter (1994) when they analysed U.S. IPOs for the period 1960 to 1996 involving 13,308 IPO firms, the following negative initial returns were noted: The lowest negative initial return realised was -0.7% while the highest noted negative return was -17.8%.

In Kenyan market, a study by Maina (2004), found out that the average initial return was 22.57% using a sample of 14 IPOs. The highest initial return was realised by Standard Chartered bank at 72% while the lowest with negative return was of Athi River with negative -26.12%. The Athi River shares were offered at kshs 12.25 but at close of trading during the first day, it traded at kshs 9.05 thus realising a negative return. Mumias share offer recorded nil return on the first day performance since the offer price of kshs 6.25 was also the first day closing price.

2.1.1 Pricing of IPOs

The pricing of a new issue is taken as a problem because it is the one which determines the amount of initial return realized once the shares start to trade in the market. From literature all over the world IPO's are on most cases under priced. For example, Ritter and Welch (2002) find that during 1980-2002 the average first day return for new equity issues in the US was about 18.8%. Similar patterns have been documented for IPOs in several other countries around the world.

The initial under pricing phenomenon of IPOs refers to the positive average initial return found over a short period of time after the issue. The initial returns are typically measured between the offering price and the closing price at the end of the first day after the IPO trades in the stock market. Since the initial return period is very short, the returns are generally not adjusted by any benchmark. Most of the studies measure initial returns during the first day of trading. Ibbotson and Jaffe (1975) report an average initial return of 16.8% using a much larger sample in a similar period. Ritter (1984) finds an initial return of 18.8% for a sample of 5,162 IPO's. Additional studies documenting positive initial returns are Miller and Reilly (1987), Carter and Manaster

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(1990). Tinic (1988), and Ibbotson, Sindelar and Ritter (1988) who found 16.4% average initial return for a sample of 8.668 IPOs during 1960-87.

Ross (1990) says pricing of IPOs is the most difficult activity for underwriters as it constitutes a potential cost to the issuing firm, in that if the issue is priced too low it may be oversubscribed and existing shareholders will experience an opportunity loss, if set too high it may be unsuccessful and can be withdrawn. According to Richard (1991) it is the issuing firm and the underwriter who determines the price. Pricing of stocks in IPOs may be the most critical stage of the whole process of going public since the stock prices calculated for IPOs affect the after market performance of IPOs.

The expectations of issuing firms, investors and underwriters in IPO pricing are considerably different. Issuing firms like to get highest issuing price to maximize cash flows to the firm. Investors like to purchase shares at deep discounted price so that they can realize good return in a short investment period. Underwriters act as an intermediary between investors and issuing firms. If IPO prices set by underwriters is viewed by investors as relatively high, investors may be reluctant to buy new issues which results in low commissions and/or unwanted investment in stocks for the underwriter.

2.1.2 Under pricing of IPO's

A number of theoretical models of under pricing have emerged in the past several years; most revolving around information problems. Rock (1986), for example, divides the pool of potential investors into two categories: informed and uninformed. The former can distinguish between IPOs and invest only in issues with a positive expected initial return; the latter are unable to make such a judgement. Fairly pricing IPOs would yield uninformed investors a negative average returns, since informed investors would often cause over-subscription and therefore rationing on the high-return issues. Informed investors would leave less profitable issues to the uninformed. In order to attract both uninformed and informed investors, the average IPOs must be under priced. The model implies a positive relationship between the magnitude of

under pricing and the risk of an issue. Empirical research so far largely affirms Rock's model (1986) (Beatty and Ritter. 1986. Koh and Walter. 1989, and Michaely and Shaw, 1993).

In a related vein, Carter and Manaster (1990) relate the risk of a new issue to underwriter reputation. The prestige of the lead underwriter is seen as a proxy for an issuer's quality; thereby inducing a negative relationship between the underwriter reputation and the amount of under pricing. Carter and Manaster (1990) and Carter, Dark, and Singh (1998) rate underwriters on a ten-point scale, based on their billing in IPO announcements in the Wall Street Journal, and then determine the link between this rating and share price performance. These, and a number of other studies, find a statistically significant negative correlation between under pricing and underwriter reputation.

In contrast, signalling models suggest that, in the presence of asymmetric information, high quality firms under price more than low quality firms. Using a typical signalling framework, for example, Allen and Faulhaber (1989) and Welch (1989), argue that high-quality firms send a costly signal to the market by under pricing their issues. Low-quality firms cannot afford to use under pricing to falsely signal high quality, because their initial losses from doing so exceed expected long-run returns. Thus, the under pricing signal distinguishes between high and low quality firms. Chemmanur (1993) suggests, moreover, that under pricing new issues compensates outside investors for their costly information production activities.

Baron's (1982) model characterizes under pricing as a result of the information advantage that underwriters hold over issuers. Setting a low issue price relative to true value increases the probability of placing an issue in its entirety and also reduces the effort needed to sell those shares. Assuming that underwriters' effort in marketing the IPO cannot be successfully monitored by the issuing firm, underwriters will under price IPO's on average. Despite the theoretical appeal of the model, however, Muscarella and

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Vetsuypens' (1989) analysis turned up contrary evidence. In particular, the 38 American investment banks that went public between 1970 and 1987–issues that should have been freed from underwriter-issuer information problems–under priced at rates comparable to those on IPO's of equivalent size.

Also grappling with the issue of asymmetric information, Bias, Bossaerts, and Rochet (1998) provide an optimal mechanism for IPOs. This approach addresses the moral hazard problems that arise separately in Baron (1982) and Rock (1986): firms have private information about their quality but are relatively uninformed about marketing; while underwriters and institutional investors have superior information about markets but incomplete or imperfect information about the quality of the issue. An advantage of this analysis is that it deals with the agency problem between the seller and the intermediary and addresses the possibility of cooperation between underwriters and institutional investors. The optimal mechanism yields under pricing as a rent to informed agents. Moreover, the model implies that price is a decreasing function of the quantity allocated to uninformed investors; thereby yielding information revelation by the intermediary and ameliorating the winner's curse problem faced by uninformed investors. The empirical analysis of the French market, particularly useful due to its reporting of rationing, motivates the theoretical results.

The empirical results obtained in Kiymaz (1997) for Istanbul stock Exchange support Rock's (1986) asymmetric information hypothesis. Informed investors would only buy shares if they were under priced. Knowing this, underwriters tend to under price IPOs.

It is well recognized in the literature that newly issued equities on average earn a significantly positive return on the first day of trading following their initial public offering (IPO). For example, Ritter and Welch (2002) found that during 1980-2002 the average first day return for new equity issues in the US was about 18.8%. Similar patterns have been documented for IPOs in several other countries around the world.

Some of past studies focus on specific factor(s) as explanatory variables for IPO

Under pricing. For example, Beatty and Ritter (1986) consider the level of ex-ante uncertainty surrounding the intrinsic value of an issue as a critical factor in explaining the under pricing: the greater the uncertainty the larger the under pricing. Booth and Smith (1986), Titman and Trueman (1986), Balvers, McDonald, and Miller (1988), Carter and Manaster (1990), and Carter, Dark, and Singh (1998) suggest that the quality of advising agents (e.g., investment bankers, accountants, auditors) is negatively related to IPO under pricing levels. Tinic (1988) and Hughes and Thakor (1992) propose that the under pricing represents an insurance premium imposed by issuers and underwriters to avoid legal liabilities under federal securities laws for material misstatements in the offering prospectus or registration statement.

Most investors buy common stock not for their sake but for what they anticipate from them after their commitment (Lorie 1978). This is generally in form of dividends or capital gain and if they perceive the initial offering to be under priced they will purchase to make a gain. Hence tendency to over subscribe the offer," if you are smart you will play the game only if there is substantial under pricing on the average" (Rock 1986). Ibbotson (1975) found out that excess return of the new issues rose approximately 11.4% in the first month. Fisher (1972) argued that based on efficient market hypothesis early price behavior has no value in predicting later price behavior. Empirical studies (Smith 1986) reported that initial public offerings achieve sizeable average returns over short periods, suggesting that the offering may have been under priced.

Ritter (1986) argues that while on average initial public offering have positive initial returns, a large fraction of them have price declines and the offering that shoot up in price are much more commonly oversubscribed than those that decline in price. Relly (1977) suggest that the short run price adjustment after the offering should be continued through the long run as the market continues to recognize and adjust for the mispricing. This implies that after the issue, the true market value of share is determined.

Ross (1990) says that when a firm goes public particularly for the first time, the buyers know relatively very little about the firm's operations instead they rely on the judgment of the investment banker who has presumably examined the firm in details and given the wide interaction with customers, the banker stand better informed than the firm. The reason for under pricing then is because the firm must compensate the investment banker for providing advice and marketing the securities, the offering price is then a decreasing function of uncertainty about the market demand. However Muscarella (1989) found out that self-underwritten IPO by securities firm display same under pricing like that of IPO underwritten by investment bankers.

Fisher (1972) stated, "it is widely alleged that underwriters may attempt to under price new issues of common stock so that initial offering will be fully subscribed and rise in price subsequent to issue" In general, the greater the uncertainty about the true price of the new shares, the greater the advantage of the informed investor and uninformed investors through under pricing implies the issues will be fully oversubscribed and therefore there is a relationship between offering price and the rate of subscription.

Bealey (1978) stated, "Many investment bankers and institutional investors argue that under-pricing is in the interest of the issuing firm. They say low offering price on initial public offering raises the price of the stock when it is subsequently traded in the market and the firm's ability to raise further capital" Ross (1990) claims," When the price of a new issue is too low, the issue is often oversubscribed"

2.1.3 Theories of under pricing of IPO's

2.1.3.1 The winner's curse hypothesis

An important rationale for the under pricing of IPO's is the "winner's curse" explanation introduced by Rock (1986). Since a more or less fixed number of shares are sold at a fixed offering price, rationing will result if demand is unexpectedly strong. Rationing in itself does not lead to under pricing, but if some investors are at an informational disadvantage relative to others, some investors will be worse off. If

some investors are more likely to attempt to buy shares when an issue is under priced, then the amount of excess demand will be higher when there is more under pricing. Other investors will be allocated only a fraction of the most desirable new issues, while they are allocated most of the least desirable new issues. They face a winner's curse: if they get all of the shares, which they ask for, it is because the informed investors don't want the shares. Faced with this adverse selection problem, the less informed investors will only submit purchase orders if, on average, IPO's are under priced sufficiently to compensate them for the bias in the allocation of new issues. Numerous studies have attempted to test the winner's curse model, both for the U.S. and other countries. A cross sectional implication of the model, developed in Beatty & Ritter (1986), is that riskier issues should have greater underpricing, on average. While the evidence is consistent with there being a winner's curse, other explanations of the new issues under pricing phenomenon exist. A direct test of the model by Koe & Walter (1989) using data from Singapore supported the model.

2.1.3.2 The market feedback hypothesis

According to Ritter (1998), where book building is used, investment bankers may under price IPOs to induce regular investors to reveal information during the pre-selling period, which can then be used to assist in pricing the issue. In order to induce regular investors to truthfully reveal their valuations, the investment banker compensates investors through under pricing. Furthermore, in order to induce truthful revelation for a given IPO, the investment banker must under price issues for which favourable information is revealed by more than those for which unfavourable information is revealed. This leads to a prediction that there will only be a partial adjustment of the offer price from that contained in the preliminary prospectus to that in the final prospectus. In other words, those IPO's for which the offer price is revised upwards will be more under priced than those for which the offer price is revised downwards.

2.1.3.3 The bandwagon hypothesis

According to Ritter (1998), the IPO market may be subject to bandwagon effects. If potential investors pay attention not only to their own information about a new issue, but also to whether other investors are purchasing, bandwagon effects may develop. If an investor sees that no one else wants to buy, he or she may decide not to buy even when there is favourable information. To prevent this from happening, an issuer may want to under price an issue to induce the first few potential investors to buy, and induce a bandwagon, or cascade, in which all subsequent investors want to buy irrespective of their own information.

An interesting implication of the market feedback explanation, in conjunction with bandwagons, is that positively sloped demand curves can result. In the market feedback hypothesis, the offering price is adjusted upwards if regular investors indicate positive information. Other investors, knowing that this will only be a partial adjustment, correctly infer that these offerings will be under priced. These other investors will consequently want to purchase additional shares, resulting in a positively sloped demand curve. The flip side is also true: because investors realize that a cut in the offering price indicates weak demand from other investors, cutting the offer price might actually scare away potential investors. And if the price is cut too much, investors might start to wonder why the firm is so desperate for cash. Thus, an issuer faced with weak demand may find that cutting the offer price won't work, and its only alternative is to postpone the offering, and hope that market conditions improve.

2.1.3.4 The investment banker's monopsony power hypothesis

Ritter (1998), another explanation for the new issues under pricing phenomenon argues that investment bankers take advantage of their superior knowledge of market conditions to under price offerings, which permits them to expend less marketing effort and ingratiate themselves with buy-side clients. While there is undoubtedly some truth to this, especially with less sophisticated issuers, when investment-banking firms go public, they under price themselves by as much as other IPO's of

similar size. Investment bankers have been successful at convincing clients and regulatory agencies that under pricing is normal for IPO's.

2.1.3.5 The lawsuit avoidance hypothesis

Since the Securities Act of 1933 in US makes all participants in the offer who sign the prospectus liable for any material omissions, one way of reducing the frequency and severity of future lawsuits is to under price. Under pricing the IPO seems to be a very costly way of reducing the probability of a future lawsuit. Furthermore, other countries in which securities class actions are unknown, such as Finland, have just as much under pricing as in the U.S. Tinic (1988) develops this hypothesis, and presents evidence that is consistent with it.

2.1.3.6 The signalling hypothesis

Several signaling models have formalized the notion that underpriced IPOs "leave a good taste" with investors, allowing the firms and insider to sell shares in future at higher prices. The IPO firm follows a dynamic issue strategy, in which the IPO will be followed by a seasoned offering. Faulhaber (1989), Welch (1989) and Grintblatt & Hwang (1989). There is some probability that investors will become aware of the true value before the seasoned offering, in which case any actions undertaken at the time of the IPO will have little consequence for the seasoned offering.

2.1.3.7 The ownership dispersion hypothesis

Ritter (1998), indicates that issuing firms may intentionally under price their shares in order to generate excess demand and so be able to have a large number of small shareholders. These disperse ownership will both increase the liquidity of the market for the stock, and make it more difficult for outsiders to challenge management.

2.1.3.8 Information cascade

Welch (1982) presents an equilibrium model in which he argues that IPO market is subject to information cascade. In the model, potential investors pay attention not only

to their own information about a new issue, but also whether other investors are purchasing. If an investor sees no one else wants to buy, he may decide not to buy even when he has favorable information. To prevent this from happening, an issuer may want to under price an issue to induce the first few potential investors to buy, and induce a cascade in which all subsequent investors want to buy irrespective of their private information.

2.1.3.9The Information Asymmetry Hypothesis

This hypothesis focuses on information asymmetries between issuing firms and their investment bankers. Baron & Holmstrom (1980) and Baron (1982) hypothesize that investment bankers take advantage of their superior knowledge of market conditions to under price offerings, which permits them to expend less marketing effort and endear themselves with buy side clients. In Baron's information asymmetry theory, it is argued that underwriters are better informed about the appropriate price of an IPO shares than the issuers, because they possess greater information about investor demand for securities. In addition, underwriters have an incentive to recommend an offering price below the true market value to reduce the marketing effort and o avoid unsold shares.

2.1.3.10 The Stabilization Hypothesis

Ruud (1993) argues that the practice of stabilization by investment bankers results in average initial returns that are substantially overstated. Stabilization is the practice of buying large numbers of shares in the immediate after market in an effort to prevent the price from falling.

2.2 Subscription Rate

The rate of subscription reflects demand for company shares and is measured by calculating the ratio of the number of applications for shares received by the issuing firm to the number of shares offered for sale (Buckland1981). it is the ratio of number of shares applied for by investors to the number of shares offered by the company. Researchers argue that pricing phenomenon (offering price) explains this tendency of over subscription. Moses and Cheney (1989) summarize this argument. as while fundamentals of publicly traded securities of comparable companies will be used in setting the offering price. the fact remains that there is uncertainty about the market's acceptance price. They then ascertain that if the price set by the underwriter is perceived by market as too low. the issue will be oversubscribed and availability to small-scale individuals will be quite limited. Often in these instances the first price in the secondary market may be substantially above the offering price.

According to Beatty (1986). many IPOs shoot up in price while others decline in price once they start to trade. Those that shoot up in price are much more commonly oversubscribed than those that decline in price. In such case. oversubscription implies that many investors who wanted to buy shares at issue stage will have to wait until the shares hit the secondary market and buy them at prevailing market price. The company going public will have to refund a lot of money back to the potential investors. Like the recently concluded Safaricom offer. they had to refund back over Kshs 180 billion. Davis (1976) states that 'there is evidence to suggest a clear prima facie relationship between application level and initial return'

The information about aggregate demand from investors. especially informed investors. may leak and become public knowledge before investors have finished bidding for firm's shares [Chowdhary and Sherman (1996)]. When all investors know ex-ante that the issuing firm is 'too good' to pass by. a large oversubscription for the firm's shares would be observed. In fact. Koh and Walter (1989) and Lee. et al (1996) use the subscription level as a proxy for "informed" demand in their study

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of short- and long-run performance of IPO's in Singapore. With above discussions, we can expect that a positive relationship between investor demand and IPO performance exists because the levels of investor demand are positively related to the quality of issuing firms. Specifically, we expect that high demand IPO's would not only exhibit relatively higher returns during the first trading days, but also continue to outperform in the long run.

The rational expectation hypotheses proposes to explain the IPO's under pricing puzzle by holding the view that the observed high initial returns are the result of an IPO being "under priced" at the initial offering. To explain the motivations of why IPO's are "under priced" by issuing firms and underwriters, some theories suggest the issuing firms or the underwriters can benefit from fixing too low a price because it can signal firm value [Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989)], reduce the probability of subsequent legal action [Tinic (1988)], and enhance underwriter reputation among investors [Booth and Smith (1986), and Carter and Manaster (1990)]. They argue that information about aggregate investor demand may leak and become public knowledge before investors have finished bidding for firm's shares in many markets (including Hong Kong) where the offer price is set well in advance of the offering Sumit Agarwal (2003). Consequently, when all investors know ex-ante that the offer price is 'too low' and a large oversubscription for the firm's shares would be observed. In their model, investor demand is positively related to the levels of IPO under pricing. A severely under priced IPO will attract a large number of investors who try to exploit short-run profit opportunities resulting from under pricing. If this is the case, we expect that the high-demand IPOs will experience a relatively large positive return on the first post-IPO trading day. However, this difference in post-issuing performance between high- and low-demand IPOs could only occur in the short run. Moreover, opening day trading could rapidly correct the mistake in pricing of the IPOs. 'Our results, at first glance, are consistent with their prediction and show a positive relationship between the over-subscription ratio and the initial returns' Sumit Agarwal (2003).

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The above literature review has expounded on the underpricing of IPOs as depicted by positive initial returns, which gives implication that the IPO shares were actually underpriced. Also findings both in Kenya and in other parts of the world and also summarized in the above literature review have noted negative initial return situations, this has now given rise to constant need to review the IPO market so as to be able to narrow the knowledge gap existing as to why IPO behave in different ways across the world. Several explanations have been given in the literature explaining the reasons for underpricing. More research needs to be carried out in the Kenyan market to be able to capture the current IPO market performance as this is still an emerging market and there are few firms, which have been listed at NSE. The Kenyan IPO market is therefore prone to wide variations in performance as new companies get listed. This formed the basis of carrying out this research to review the average initial return position since the last one done in 2004 by Maina. Since then there have been more companies listed which have made history in NSE. Safaricom offer to date is the largest IPO offer in the NSE listing shares of kshs 50 billion while Eveready offer achieved the highest subscription rate of 800% so far at NSE. All these new changes therefore necessitate a review of the IPO market performance.

CHAPTER THREE

3.0 RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

The research design adopted in this area of study is event studies, which sought to examine the effect of an event. An event here is an IPO offer. An event study is done for each IPO offer to establish the first day initial return after listing at NSE.

3.2 Population

The population of the study consists of all quoted companies, which have been listed at NSE since its inception in 1954. Over time some companies have been suspended, others delisted from NSE. Appendix 1 is a list of those companies, which were still actively trading at NSE as at 30th September 2008.

3.3 Sample Design and Size

For a firm to be included in the sample it had to fulfill the following criteria. (i) Have equity stock listed in NSE. (ii) Have all information relating to offer price and first day closing prices. (iii) Have information relating to shares on offer and the applications received for each IPO offer. (iv) Includes all firms that have been de-listed, or suspended e.g. African Lakes, Firestone and Kenya Re (v) Have information relating to IPO proceeds received. Upon taking into account the above requirements, we are left with a sample of twenty-four companies listed for the first time from 1984 to 2008. Data of interest for earlier companies listed at NSE were not easily available.

3.4 Data Specification and Collection

The data used in the study was primarily secondary in nature. The data was obtained from the NSE secretariat and individual companies. Information of interest for each

IPO includes: issue (offer) price, first day trading closing price, shares on offer, the total applications received for each IPO and IPO proceeds received.

3.5 Data Analysis

3.5.1 Initial Return Computation

The first day initial return (IR) for each IPO was computed as follows:

$IR_i = (P_i - S_i)/ S_i.$

Where Pi is the closing price on the first trading day and Si is the offer (subscription) price.

Summary statistics:

Mean of initial returns ($\bar{x}$) is calculated as follows:

$$\bar{x} = \frac{IR_1 + ... + IR_N}{N}$$

Where $IR_1 + ...,+ IR_N$ is sum of initial returns for all IPOs in the sample and N is the number of IPOs.

Standard deviation of initial returns (σ) is calculated as follows:

$$\sigma = \sqrt{\frac{1}{N} \sum_{k=1}^{k=N} \left(IR_k - \bar{x}\right)^2}.$$

Where $\bar{x}$ – is mean of initial returns. IR_1 are sum of initial returns from IPO no.1 to IPO N and N is the number of IPOs.

3.5.2 Subscription Rate

The rate of subscription reflects demand for company shares and is measured by calculating the ratio of the number of applications for shares received by the issuing firm to the number of shares offered for sale.

SR= (SA/SO) x100 Where SR is subscription rate; SA is number of shares applied for and SO is number of shares on offer.

Summary statistics:

Mean of subscription rate ($\bar{x}$) is calculated as follows:

$$\bar{x} = \frac{SR_1 + \ldots + SR_N}{N}$$

Where $\bar{x}$ – is mean of subscription rates. $SR_1 + \ldots + SR_N$ is sum of subscription rates for all IPOs in the sample and N is the number of IPOs.

Standard deviation of subscription rates (σ) is calculated as follows:

$$\sigma = \sqrt{\frac{1}{N} \sum_{k=1}^{k=N} \left(SR_k - \bar{x}\right)^2} \; .$$

Where x – is mean of subscription rates. SR_k is sum subscription rates of IPO no.1 to IPO no. N and N is the total number of IPOs in the sample.

3.5.3 Regression Analysis and Correlation Analysis

The following regression model is performed:

$Y = b_0 + b_1 X + \varepsilon$

Where Y is initial return, X is the subscription ratio, which is to test whether there is a relation between investor demand and IPO initial return. The cross-sectional regression results are interpreted to show whether the subscription ratio is a strong predictor of initial returns or not. The study was also designed to find out what a unit increase in the subscription ratio contributes to, on average, increase in initial returns. The study also established the nature of coefficient of correlation as either positive coefficient or negative and its relationship strength, which is between +1 and -1. Coefficient of correlation gives indication of the strength of the linear relationship between two variables

CHAPTER FOUR

4.0 DATA ANALYSIS AND FINDINGS

4.1 Introduction

In this chapter, the data obtained from relevant sources was analyzed and presented in summarized form. The first part contains data analysis associated with computation of initial return, its summary statistics and its findings. The second part looks at subscription rates, its summary statistics and findings. The final part contains data analysis aimed at finding out whether there is a relationship between the initial return and investor demand as shown by the subscription rate. Regression analysis and correlation analysis are used as the major tools of analysis.

The data for this study was obtained mainly from Nairobi stock exchange (NSE) and some from individual companies. The nature of data collected is shown in Appendix 2. This relates to number of shares floated by each IPO offer during the period of study, the share applications received, IPO offer price and closing price during first day trading in the stock market for each IPO offer. When the shares application received for each IPO is divided with shares floated, we get the subscription rate, which is also tabulated, in the Appendix 2. Initial return is computed as the difference between first day closing price and the offer price and the resulting difference is divided with the offer price.

4.2 First day performance of IPOs

Table 1 below presents the first day initial returns for the 24 IPOs, which shows an average return of 40.28%.

Table 1 Summary Statistic for initial returns

Variable	N	Mean	Std Dev
Initial Return	24	0.4027667	0.5480768

The above results show an increase in first day return performance in Kenyan market by 17.71% when compared with a study by Maina (2004) when he found the average first day return then to be 22.57%. The standard deviation has also increased from 24.088% in the last study by Maina (2004) to 54.8%. This signifies increased variability of initial returns within the mean return. The above increased standard deviation when compared to previous study by Maina (2004) is attributed to high initial returns realized in Kengen offer of a 236.13% and Equity offer at 137.14%.

Appendix 4 provides details for computation of initial return for all IPOs under study. These are first day closing price per IPO offer and the offer price. The last column of Appendix 4 provides initial returns for each IPO offer. The results show that the highest first day return is that realized by Kengen at a 236.13%. Kengen first day closing price was kshs 40 as compared to the offer price of kshs 11.90. Athi River offer realized the lowest initial return of negative -26.12 %. It still remains the IPO with the lowest initial return with negative return just like in the study by Maina (2004). Its first day closing price was at kshs 9.05 as compared with kshs 12.25 offer price. With average initial return of above 40%, it appears that investors are better off investing in IPOs as they stand to realize positive first day initial return thus suitable for short term investors. However it is important for investors to know that there is wide variations in expected first day return as shown by the standard deviation which has increased to about 54.8% away from average initial return.

The above findings compares favorably to results reported by Summit Agarwal (2003) in Hong Kong market when he found an average initial return of 20.76%. The

Kenyan market IPO average initial return is almost twice the results obtained in the Hong Kong market as it stands at 40.28%. Other studies on first day initial return include, Ritter and Welch (2002) who found that during 1980-2002 the average first day return for new equity issues in the US was about 18.8%. Similar patterns have been documented for IPO's in several other countries around the world. Ibbotson and Jaffe (1975) report an average initial return of 16.8%. Ritter (1984) found an initial return of 18.8% for a sample of 5,162 IPO's. Additional studies documenting positive initial returns are Miller and Reilly (1987), Carter and Manaster (1990), Tinic (1988), and Ibbotson, Sindelar and Ritter (1988) who found 16.4% average initial return for a sample of 8,668 IPO's during 1960-87.

Appendix 5 tabulates average initial returns for 33 countries. The columns in the Appendix captures country, sample size, time period covered in computation of average initial return and finally initial returns recorded from studies from other parts of the world. The Appendix shows that the highest initial return is 388% realized in China during the study covering period 1990-96 involving a sample of 226 IPOs. The lowest initial return is 5.4% observed in Canada during the study covering period 1971-1992 involving 258 IPO firms. The average initial return for the 33 countries above is 38.77%, which is slightly below the 40.28% realized in the Kenyan market. The results show that Kenyan IPO market first day performance averages what is realized in international IPOs markets.

The results of this study clearly show that an investor on initial public offering earns high return in the short run. The theory of efficient market suggests that the price of newly issued stock will quickly adjust to reflect the available set of relevant information. To the extent that underpricing exists, the difference between first day closing price and the offer price represents a capital gain available to IPO subscribers who opt to dispose their IPO shares once they start to trade in the stock market.

4.3 Investors Demand

Table 2 below presents the investors demand as shown by subscription rate and its summary statistics for the 24 IPOs.

Table 2 Summary Statistic for subscription rate

Variable	N	Mean	Std Dev
Subscription Rate	24	2.9107500	1.8461754

From the above table average subscription rate stands at 291.08%, which shows an increase of 62.30% as compared to 228.78% in a study by Maina (2004). The standard deviation stands at 184.6%. This signifies high variability of subscription rate within the mean rate. From Appendix 3, the highest subscription rate is 800% achieved during Eveready IPO offer. This shows an increase in subscription rate since the study by Maina (2004) when he found the highest subscription rate to be 613% in Barclays bank offer. The lowest subscription rate still remains as that observed by Maina (2004), a 60 % in Mumias IPO offer. With increased average subscription rate to above 291%, it signifies that investors in Kenya are developing high appetite for investment in shares at NSE. However investors demand per IPO offer still fluctuates widely as shown in the high standard deviation of 184.6%.

A study by Summit Aggarwal (2003) in Hong Kong market found the mean subscription ratio to be 90%. However, their study established that the level of investor demand for IPOs differs dramatically from firm to firm. For instance, the largest subscription ratio found was reaching 1.276% and the least ratio was 22%. He concluded that, though shares of most IPOs in the Hong Kong stock market are over-subscribed by investors, there were also IPOs that did not generate enough demand as indicated above of 22% of the shares on offer. In the Kenyan market, highest demand to date is at 800% and least demand is at 60%.

In the Kenyan market, another possible explanation for the high rate of subscription may be as a result of few companies currently listed at NSE. Thus due to low listing at NSE when a company issues shares, many investors are eager to buy the shares. This could explain the reasons for the high subscription rates recorded so far in the Kenyan

market averaging 291% where a sample of 24 IPO firms is used. In the Hong Kong market. Sumit Agarwal (2003) obtained average subscription rate of 90% using a bigger sample of 256 IPO firms.

4.4 Linear Regression Analysis and Findings

Regression analysis tells us how one variable is related to another by providing an equation that allows us to use the known value of one or more variables to estimate the unknown value of the remaining variable. Correlation analysis tells us the degree to which the two variables are related Levin (1987).

In the regression analysis, regression equation, which relates the subscription rate and initial return, is developed. The correlation analysis is applied to determine the degree to which the two variables are related. Correlation analysis tells us how well the estimating equation actually describes the relationship. It was expected that the findings would offer an explanation to the high rate of subscriptions observed when companies get quoted for the first time at NSE.

A trend line for the total sample of 24 companies was fitted in order to get an appreciation of the general relationship between initial returns and subscription rate over the period of the study.

Upon running the regression equation below using Statistical Program for Social Sciences (SPSS) software. $Y = b_0 + b_1X + \varepsilon$ the following results in table 3 below were found.

Table 3 Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error (ε)	t Value	Pr > |t|
Intercept (b$_0$)	1	0.21346	0.21159	1.01	0.3240
Subscription Rate (b$_1$)	1	0.06504	0.06176	1.05	0.3037

The above table shows the parameter estimates of the regression model. Both the intercept and coefficient for subscription rate are not statistically significant. The

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results above imply that we cannot explain any linear relationship between initial returns and subscription rate. The results obtained from SPSS are interpreted below:

4.4.1 Coefficient of Determination (R-Square)

The coefficient of determination, expresses the amount of variation in the dependent variable that is explained by regression equation. That is, it measures the proportion of variation in dependent variable that can be explained by variation in the independent variable. The regression analysis results of the study is shown in table 4 below

Table 4 R-square

R-Square	0.0480
Adj R-Sq	0.0047

The above results indicate that the coefficient of determination is equal to 0.0480 (4.8%). This means that only 4.8% of variation in the initial return is attributed to subscription rate realized on new shares issued through IPO.

A coefficient of determination of 4.8% is very low when linear regression model is used. It also shows that the regression equation only explains 4.8% of the model leaving 95.2% of the variation in the model unexplained.

The above finding is low when compared with 0.18 (18%) found in a study by Summit Aggarwal (2003) in the Hong Kong market using also a linear regression model.

4.4.2 Correlation Coefficient (R)

Correlation coefficient is used to measure the strength/degree of relationship between the two variables. It shows how closely the two variables move together. It therefore indicates how well the regression line explains the variation in the values of the dependent variable. The correlation coefficient expresses the strength of the relationship as a quantity between negative one and positive one. The sign signifies the direction of the relationship that is direct or inversely related and must agree with

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the slope of regression line. The correlation coefficient measures the strength of the relationship between the independent and the dependent variable.

Table 5 below reports the correlation analysis between subscription rate and initial returns.

Table 5 Correlation between Initial Return and Subscription rate

Variable	Subscription Rate	Initial Return
Subscription Rate	1.0000	0.2191
Initial Return	0.2191	1.0000

The result above shows a correlation coefficient equal to 0.2191(21.9%). This implies a weak and positive relationship between initial return and subscription rate.

4.4.3 Analysis of variance (ANOVA)

Analysis of variance (ANOVA) of the regression relationship also showed that the regression model was not statistically significant (p=0.3037>0.05). It means that none of the predictor variables in the model has any significant association or inference on the dependent variable.

Table 6 Analysis of Variance Table

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.33158	0.33158	1.11	0.3037
Error	22	6.57735	0.29897		
Corrected Total	23	6.90893			

The linear regression model shows that the subscription rate explains very little of the variation in the initial return. The two variables have weak positive relationship and the model relating the two is not significant at either 5% or 10% level of significance.

4.5 Trend Line

In view of the weak relationship identified above by running the linear regression model, the researcher fitted a trend line to the figure 1 below, which plots initial return versus subscription rate. The aim is to see the nature of trend line, which can hint on the possible nature of relationship between initial return and subscription rate.

Figure 1 Plot of Initial Returns and Subscription Rate

Relationship between Initial Returns and Subscription Rate

The rugged curve joins the intersection points of initial return and subscription rate for each IPO offer over the period of study. While the smooth curve represents the line of best fit which provides an appreciation of the general relationship between the subscription rate and initial return over the period of the study. From the figure above, there appears no linear relationship between the two. The trend line shows a more quadratic (polynomial) relationship between initial returns and subscription rate. The researcher therefore decided to run regression analysis using quadratic regression model below:

$Y = b_0 + b_1X + b_2X^2 + \varepsilon$, where Y is initial return, X is subscription rate, b_0 is intercept and ε, is error term

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4.6 Quadratic Regression Analysis and Findings

4.6.1 Coefficient of Determination (R-Square)

When a quadratic regression equation of the form shown above is fitted to the statistical software model (SPSS). R-square becomes 0.2235 which implies that a quadratic model explains more variation (22.3%) in the model which is higher than a linear model where it only explained 4.8%. This compares favorable to findings by Summit Aggarwal (2003) when he found 18% in Hong Kong market using linear regression model.

See table 7 below for summary of findings.

Table 7

R-Square	Coeff Var	Root MSE	INITIAL_RETURN Mean
0.223468	125.4937	0.505447	0.402767

The correlation coefficient (R) is 0.47. which is moderate positive relationship between initial return and subscription rate when compared to 0.219 in linear regression model.

4.6.2 Analysis of variance (ANOVA)

Analysis of variance (ANOVA) of the quadratic model relationship is shown in table 8 below.

Table 8 Analysis of Variance Table

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1.54392478	0.77196239	3.02	0.0703
Error	21	5.36500375	0.25547637		
Corrected Total	23	6.90892853			

The table above shows that the quadratic regression model is statistically significant (p=0.0703<0.10). This means that in a quadratic model, the p-value of the ANOVA tables becomes 0.0703, which is smaller and significant at 10% level of significance as compared to 0.3037 in the linear regression model, which was not significant at 5% and also at 10%.

4.6.3 Parametric Estimates

Table 9 below shows the parameter estimates of the quadratic regression model.

Table 9 Parameter Estimates using A Quadratic model

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-.3457472740	0.32272933	-1.07	0.2962
Subscription Rate	0.4728642719	0.19572467	2.42	0.0249
Subscription Rate * Subscription Rate	-.0534871521	0.02455341	-2.18	0.0409

The coefficient for subscription rate is statistically significant (p<0.05) while the intercept is not. The parameter estimates using a quadratic model shows that the coefficients are significant (p=0.0249<0.05) except for the intercept is not significant (p=0.2962>0.05.

A study by Summit Aggarwal (2003) reports cross-sectional regression results showing that the subscription ratio is a moderate predictor of initial returns using linear regression model. They found that subscription rate contributes to, on average, a 18 percent increase in initial returns. In the Kenyan market from above results in table 7, it shows a positive moderate relationship between initial return and subscription rate using quadratic model. The results shows that 22.3 % change in initial return is explained by subscription rate when quadratic model is used which is better than what the linear regression model results gave. The linear regression model as shown in table 4 above found that 4.8% change in initial return was being explained by subscription rate.

CHAPTER FIVE

5.0 SUMMARY AND CONCLUSIONS

5.1 Summary

The findings of this study show that initial public offerings at NSE are on average issued at a discount and realize positive initial returns except in the case of Athi River. which realized a negative. return. Save for Athi River IPO offer. IPOs at NSE are on average underpriced and implies that short term investors can make a capital gain by investing in shares at NSE. Estimated underpricing in NSE is found to be 40.28% and represents an increase of 17.71% as compared to study by Maina (2004) when he found initial return to be 22.57%. This finding also compares favorably to those reported by Summit Agarwal (2003) when they found average first day return of 20.76%.

The study further found out that average subscription rate stands at 291.08% which shows an increase of 62.30% as compared to 228.78% in a study by Maina (2004). The highest subscription rate to date is 800% achieved during Eveready IPO offer. The lowest subscription rate was in Mumias IPO offer at 60%. The results also compares favorably to findings by Summit Agarwal (2003) in Hong Kong market when they found average subscription rate of 90%.

Initial return was then related to subscription rate using linear regression model. The results show that the relationship between the initial return and subscription rate is weak and positive. The linear regression model explains 4.8% of the variation in initial return is attributed to subscription rate. However the relationship is not significant.

When a quadratic regression equation is fitted to the model. coefficient of determination (R-square) becomes 0.2235. which implies that a quadratic regression model explains more variation (22.3%) in the equation. which is higher than a linear model where it only explained 4.8%. The correlation coefficient (R) in Quadratic

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model is 0.47. which is moderate positive relationship between initial return and subscription rate. This is better than 0.219 obtained in linear regression model.

Analysis of variance (ANOVA) of the quadratic model relationship is statistically significant (p=0.0703<0.10). This means that in a quadratic model. the p-value of the ANOVA table becomes 0.0703. which is smaller and significant at 10% level of significance as compared to 0.3037 in the linear regression model. which was not significant at 5% and also at 10%.

5.2 Implication of the study

The findings of this study have the following implications:

The short term holding of IPO is profitable to the subscribers. This is due to the high average positive initial return of over 40.28% (Appendix 4) realized in the Kenyan market. This means that an investor can earn a higher return as opposed to buying shares after the offer is trading in the market. The study shows that IPO initial returns in the Kenyan market has almost doubled since last study done by Maina (2004) where he found initial return of 22.57%. The study shows that firms going public are incurring high costs in form of underpricing initial public offering. This might hurt them as they try to raise capital for expansion because underpricing by issuing firm is a cost to them as much as it is a return to the investing public.

The history of underpricing hence high positive initial return has led to high demand for IPOs in the Kenyan market. This explains why the subscription rate stands at an average of 291% (Appendix 3). The study has established that a quadratic regression model as opposed to linear regression model best defines IPO market in Kenya. The Kenyan market is explained better by quadratic model than a linear regression model possibly because of the herding theory. Kenyan investors tend to follow majority investors without carrying out actual analysis to identify the actual performance of a company before investing or subscribing for an IPO. The second category of investors in the stock market after company has listed appear to do their homework and if they evaluate that the issue is not very profitable. it gives rise to low demand on the first day hence low initial return despite having recorded high subscription rate. To

highlight briefly the above, a look at Appendix 4 shows that the Eveready offer which to date has highest subscription rate of 800% achieved low first day return of 15.79% as compared with the highest first day return in the Kengen offer at 236.13% which had 337% subscription rate.

Another possible explanation for the polynomial curve explaining the relationship in Kenyan market between subscription rate and initial return could be explained by speculative bubble hypothesis. Investor demand for an IPO is largely driven by the over-optimistic and over-pessimistic reaction by investors to the information about the IPO prospects prior to offerings. Consequently, both high- and low-demand IPOs are not priced at intrinsic values in first day trading. But, eventually their true values are reflected in the evolution of the pricing process. Specifically, a high-demand IPO, which, due to investors' over optimism, is more likely to create a speculative bubble. The speculative bubble may temporarily push the stock price above its intrinsic value, followed by long-run price correction. As a result, a relatively high positive initial return will be followed by a negative long-run return. Summit Aggarwal (2003). What it implies in the Kenyan market is that investors may become overenthusiastic about an IPO offer and subscribes for it in large numbers but when the offer starts to trade in stock market, other factors like economic performance comes to play and dictates the demand. Other information on the company might come up which were not available at the subscription stage, which may then interfere with demand for the IPO in the secondary market.

In Kenyan market it appears that, a strong demand for an IPO before listing in stock exchange does not always lead to a strong demand for the same stocks during the first day of trading in the stock market. An explanation for subsequent weak demand in stock market could be unfavorable new information about the firm received in the market after IPO offer but before trading in the stock market. As a result, investors in stock market incorporate the news and trading information into their beliefs on the firm's prospects, to the extent that the demand of trading for the stock could change to be reflective of the new information. That could have been the case with Eveready shares which had 800% subscription rate but 15.79% first day return when compared

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with Kengen shares which had the highest initial return of 236.13% and low demand of 337%. The Athi River shares had 250% subscription rate but on first day of trading achieved a negative return of -26.12 %. This could imply that the high demand achieved during the IPO offer was affected possibly by negative information about the company performance before trading in stock market hence the negative return realized.

According to winners curse hypothesis on IPO underpricing, if some investors are more likely to attempt to buy shares when the issue is underpriced, then the amount of excess demand will be higher when there is more underpricing. This theory appears not fully observed in the Kenyan market as seen above those IPOs with highest initial return do not also have the highest investors demand and vice versa. If this hypothesis was holding in the Kenyan market, we then would have expected the Eveready offer which achieved the highest subscription rate to also achieve the highest initial return but we find it only achieved a low initial return of 15.79%. The company with lowest subscription rate of 60% is Mumias, which realized a zero initial return, which is better than the return, realized in Athi River, which had a subscription rate of 250% but realized a negative initial return of -26.12%. Such erratic behavior in the Kenyan market may tend to explain why quadratic model is better in explaining the nature of relationship between subscription rate and initial return as opposed to linear regression model which would hold if the winners curse hypothesis is consistently observed in the Kenyan market.

A number of empirical implications with regard to the IPO performance can be developed from Rock (1986)'s model, including the relationship between investor demand and IPO performance. According to his model, informed investors with superior information have selection ability to distinguish between "good" and "bad" IPOs. They will subscribe to only high quality issues and let uninformed investors subscribe to low quality issues. Therefore, the action by informed investors should lead to high demand for good IPOs. On the other hand, low quality IPOs will have mainly uninformed investors, which, in turn, lead to low demand. This is particularly true in those markets including Kenya, where the offer price is set well in advance of

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the trading in stock market. If the above hypothesis holds, we would expect a linear regression to explain the relationship between initial return and subscription rate. But because in the Kenyan market it is quadratic model, which explains better relationship between initial return and subscription rate, it implies that the Rock model is not fully observed in the Kenyan market.

The rational expectation hypotheses if observed would have allowed us to use linear model to define the relationship between subscription rate and initial return. But from our findings, the quadratic model explains better the relationship between subscription rate and initial return; it implies that the rational expectation model is not fully observed in the Kenyan market The rational expectation model proposes to explain the IPO's underpricing puzzle by holding the view that the observed high initial returns are the result of an IPO being "underpriced" at the initial offering. It implies that the higher the underpricing, the higher the expected initial return once it starts to trade in the market.

Lastly another possible explanation for the relationship observed in the Kenyan market between initial return and subscription rate could be explained by the investors' motive for buying IPO shares. The Kenyan market could reflect a market where investors are interested in short term capital gains associated with IPO offers. During the first day trading, it appears the supply of shares is very high therefore lowering demand in the first day of trading hence affecting the initial return. This explains why demand for IPO before trading does not translate to the initial returns realized during the first day trading.

5.3 Conclusions

It has been demonstrated that the IPO issues from 1984 to 2008 at NSE have earned a high initial return of 40.8%. The share applications have realized a 291% average subscription rate. The results show that linear regression model is not the best model in explaining the association between initial return and subscription rate for it only

explained 4.8% variation in the model. The quadratic regression model is a better model as it explains 22.3% variation in model. It further has a higher correlation coefficient of 0.47 when compared to 0.219 realized in linear regression model.

The relationship observed in quadratic regression model is further significant at 10% unlike in linear regression model when it was not significant at either 5% or 10%.

5.4 Limitation of the study

Few firms listed at NSE since inception hence low sample size used in the study.

Data for period before 1984 was not easily available. During the formative years of NSE, most of its operations were not computerized making it difficult to retrieve the necessary data. This means that it would be difficult for any meaningful research to be carried out for companies listed prior to 1984 where probably over 100 previously listed companies got their IPOs listed.

The project used a sample of 24 IPO firms. A larger sample would have been ideal. As compared with other studies in other parts of the world (Appendix 5) this is a small sample. From Appendix 5, the largest sample used to compute initial return is in the study done in USA by Ibbotson, Sinderland & Ritter involving 13,308 firms in which an initial return of 15.8% was realized. The lowest sample used was 28 firms in the study by Rogiers, Mangart & Ooghe in Belgium, which obtained 10.10% initial return. It should be noted that the total firms ever listed at NSE is much smaller when compared with other markets studied.

5.5 Suggestion for further research

The study can be replicated in future using both linear regression model and quadratic regression model with a larger sample once more firms get listed at NSE. It is recommended that a study to evaluate factors such as subscription rate, age of the firm, firm's profitability, and long term performance of IPOs be carried out to ascertain the nature of relationship using multivariate regression model. A study could also be carried out to find out why there is low listing at NSE after trading for over 50 years and how more companies can be encouraged to list in NSE

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APPENDICES

APPENDIX 1

LISTED COMPANIES AS AT 30TH SEPTEMBER 2008
NATION CENTRE, (1st FLOOR), KIMATHI STREET
P.O. BOX 43633, NAIROBI. TEL: 2831000 FAX: 224200
E-MAIL: info@nse.co.ke: Website: www.nse.co.ke

Agriculture

1. Unilever Tea (K) Ltd.
2. Rea Vipingo Ltd.
3. Sasini Tea & Coffee Ltd.
4. Kakuzi Ltd.

Commercial and Services

1. Access Kenya Group
2. Marshalls E.A. Ltd.
3. Car & General Ltd.
4. Hutchings Biemer Ltd.
5. Kenya Airways Ltd.
6. CMC Holdings Ltd.
7. Uchumi Supermarkets Ltd.
8. Nation Media Group Ltd.
9. TPS (Serena) Ltd.
10. ScanGroup Ltd.
11. Standard Group Ltd.
12. Safaricom Limited

Finance and Investment

1. Barclays Bank of Kenya Ltd.
2. CFC Bank Ltd.
3. Housing Finance Company of Kenya Ltd.
4. ICDC Investment Company Ltd.
5. Kenya Commercial Bank Ltd.
6. National Bank of Kenya Ltd.
7. Pan Africa Insurance Holdings Co. Ltd
8. Diamond Trust Bank of Kenya Ltd.

9. Jubilee Insurance Co. Ltd
10. Standard Chartered Bank Ltd.
11. National Industrial Credit Bank Ltd.
12. Equity Bank Ltd.
13. Centum Investment Company Ltd

Industrial and Allied

1. Athi River Mining Ltd.
2. BOC Kenya Ltd.
3. British American Tobacco Kenya Ltd.
4. Carbacid Investments Ltd.
5. Olympia Capital Holdings Ltd.
6. E.A. Cables Ltd.
7. E.A. Breweries Ltd.
8. Sameer Africa Ltd.
9. Kenya Oil Ltd.
10. Mumias Sugar Company Ltd.
11. Unga Group Ltd.
12. Bamburi Cement Ltd.
13. Crown Berger (K) Ltd.
14. E.A Portland Cement Co. Ltd.
15. Kenya Power & Lighting Co. Ltd.
16. Total Kenya Ltd.
17. Eveready East Africa Ltd.
18. Kengen Ltd.

Alternative Investment Market Segment

19. A. Bauman & Co. Ltd
20. City Trust Ltd
21. Eaagads Ltd
22. Express Ltd
23. Williamson Tea Kenya Ltd
24. Kapchorua Tea Co. Ltd
25. Kenya Orchards
26. Limuru Tea Co. Ltd

Appendix 2 IPO Issues between 1984-2008

Year of Issue	Company	Shares Floated	share Applications	Subscription Rate	Issue Price	1st Day Closing Price
1984	Jubilee Insurance	800,000	1,760,000	220.00%	14.4	15
1986	Barclays-1st Issue	5,000,000	30,650,000	613.00%	16	23
1988	KCB-1st Issue	7,500,000	24,525,000	327.00%	20	36
1988	NMG	2,500,000	3,325,000	133.00%	11.5	11.8
1989	SCBK	21,000,000	48,930,000	233.00%	14.5	27
1992	Uchumi	16,000,000	16,512,000	103.20%	14.5	17.75
1992	Crown Berger	8,638,000	8,983,520	104.00%	16	16.5
1994	HFCK-1st Issue	18,000,000	72,000,000	400.00%	7	10.5
1994	Firestone	40,000,000	40,400,000	101.00%	33.5	34
1994	NBK-1st Issue	40,000,000	120,000,000	300.00%	10	15
1994	NIC	179,300,000	138,061,000	77.00%	52	56
1996	Rea Vipingo	8,000,000	17,280,000	216.00%	10.5	12
1996	Kenya Airways	235,423,896	458,134,902	194.60%	11.25	12.55
1997	Serena	12,890,000	51,560,000	400.00%	13	16.8
1997	ARM	23,000,000	57,500,000	250.00%	12.25	9.05
2000	African Lakes	4,000,000	6,000,000	150.00%	94.5	98
2001	Mumias	300,000,000	180,000,000	60.00%	6.25	6.25
2006	Scan Group	69,000,000	345,000,000	500.00%	10.45	15
2006	Equity Bank	90,000,000	207,000,000	230.00%	70	166
2006	Access Kenya	80,000,000	240,000,000	300.00%	10	13.45
2006	Eveready	63,000,000	504,000,000	800.00%	9.5	11
2006	KENGEN	659,508,437	2,222,543,433	337.00%	11.9	40
2007	Kenya Re	240,000,000	972,000,000	405.00%	9.5	16
2008	Safaricom	10,000,000,000	53,200,000,000	532.00%	5	7.35

SOURCE: NSE

Appendix 3 SUMMARY STATISTICS FOR THE SUBSCRIPTION RATE

	Year		Subscript. Ratio %
1	1984	Jubilee Insurance	220.00%
2	1986	Barclays-1st Issue	613.00%
3	1988	KCB-1st Issue	327.00%
4	1988	NMG	133.00%
5	1989	SCBK	233.00%
6	1992	Uchumi	103.20%
7	1992	Crown Berger	104.00%
8	1994	HFCK-1st Issue	400.00%
9	1994	Firestone	101.00%
10	1994	NBK-1st Issue	300.00%
11	1994	NIC	77.00%
12	1996	Rea Vipingo	216.00%
13	1996	Kenya Airways	194.60%
14	1997	Serena	400.00%
15	1997	ARM	250.00%
16	2000	African Lakes	150.00%
17	2001	Mumias	60.00%
18	2006	Scan Group	500.00%
19	2006	Equity Bank	230.00%
20	2006	Access Kenya	300.00%
21	2006	Eveready	800.00%
22	2006	KENGEN	337.00%
23	2007	Kenya Re	405.00%
24	2008	Safaricom	532.00%
			291.10%
		Mean	291.10%
		Std. Dev.	185%

Research findings

Appendix 4
SUMMARY STATISTICS FOR THE INITIAL RETURN

		Year	Subscription Rate	FIRST DAY CLOSING PRICE KSHS	OFFER PRICE KSHS	INITIAL RETURN (CP_OP)/OP
1	Mumias	2001	60.00%	6.25	6.25	0.00%
2	NIC	1994	77.00%	56	52	7.69%
3	Firestone	1994	101.00%	34	33.5	1.49%
4	Uchumi	1992	103.20%	17.75	14.5	22.41%
5	Crown Berger	1992	104.00%	16.5	16	3.13%
6	NMG	1988	133.00%	11.8	11.5	2.61%
7	African Lakes	2000	150.00%	98	94.5	3.70%
8	Kenya Airways	1996	194.60%	12.55	11.25	11.56%
9	Rea Vipingo	1996	216.00%	12	10.5	14.29%
10	Jubilee Insurance	1984	220.00%	15	14.4	4.17%
11	Equity Bank	2006	230.00%	166	70	137.14%
12	SCBK	1989	233.00%	27	14.5	86.21%
13	ARM	1997	250.00%	9.05	12.25	-26.12%
14	NBK-1st Issue	1994	300.00%	15	10	50.00%
15	Access Kenya	2006	300.00%	13.45	10	34.50%
16	KCB-1st Issue	1988	327.00%	36	20	80.00%
17	KENGEN	2006	337.00%	40	11.9	236.13%
18	HFCK-1st Issue	1994	400.00%	10.5	7	50.00%
19	Serena	1997	400.00%	16.8	13	29.23%
20	Kenya Re	2007	405.00%	16	9.5	68.42%
21	Scan Group	2006	500.00%	15	10.45	43.54%
22	Safaricom	2008	532.00%	7.35	5	47.00%
23	Barclays-1st Issue	1986	613.00%	23	16	43.75%
24	Eveready	2006	800.00%	11	9.5	15.79%
				686	483.5	967%
				28.583333	20.145833	40.28%
				28.58	20.15	40.28%

Mean	40.28%
Std. Dev.	54.81%

Research findings

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APPENDIX 5
Average initial returns for 33 countries

Country	Author(s) of Article(s)	Sample Size	Time Period	Average initial Return
Australia	Lee, Taylor & Walter	266	1976-89	11.90%
Austria	Aussenegg	67	1964-96	6.50%
Belgium	Rogiers, Manigart & Ooghe	28	1984-90	10.10%
Brazil	Aggarwal, Leal & Hernandez	62	1979-90	78.50%
Canada	Jog & Riding; Jog & Srivastava	258	1971-92	5.40%
Chile	Aggarwal, Leal & Hernandez	19	1982-90	16.30%
China	Datar and Mao	226	1990-96	388.00%
Denmark	Bisgard	32	1989-97	7.70%
Finland	Keloharju	85	1984-92	9.60%
France	Husson & Jacquillat; Leleux & Muzyka; Paliard & Belletante	187	1983-92	4.20%
Germany	Ljungqvist	170	1978-92	10.90%
Greece	Kazantzis and Levis	79	1987-91	48.50%
Hong Kong	McGuinness; Zhao and Wu	334	1980-96	15.90%
India	Krishnamurti and Kumar	98	1992-93	35.30%
Israel	Kandel, Sarig & Wohl	28	1993-94	4.50%
Italy	Cherubini & Ratti	75	1985-91	27.10%
Japan	Fukuda; Dawson & Hiraki; Hebner & Hiraki; Pettway & Kaneko; Hamao, Packer, & Ritter	975	1970-96	24.00%
Korea	Dhatt, Kim & Lim	347	1980-91	78.10%
Malaysia	Isa	132	1980-91	80.30%
Mexico	Aggarwal, Leal & Hernandez	37	1987-90	33.00%
Netherlands	Wessels; Eijgenhuijsen & Buijs	72	1982-91	7.20%
New Zealand	Vos & Cheung	149	1979-91	28.80%
Norway	Emilsen, Pedersen &	68	1984-96	12.50%

	Saettern			
Portugal	Alpalhao	62	1986-87	54.40%
Singapore	Lee, Taylor & Walter	128	1973-92	31.40%
Spain	Rahnema, Fernandez & Martinez	71	1985-90	35.00%
Sweden	Rydqvist	251	1980-94	34.10%
Switzerland	Kunz & Aggarwal	42	1983-89	35.80%
Taiwan	Chen	168	1971-90	45.00%
Thailand	Wethyavivorn & Koo-smith	32	1988-89	58.10%
Turkey	Kiymaz	138	1990-95	13.60%
United Kingdom	Dimson; Levis	2,133	1959-90	12.00%
United States	Ibbotson, Sindelar & Ritter	13,308	1960-96	15.80%
	Average Return			**38.77%**

Sources: Loughran, Ritter, and Rydqvist, Pacific Basin Finance Lournal,(1994).

APPENDIX 6:   DESCRIPTIVE STATISTICS

1. Linear Regression Model Findings Summary

Correlation			
Variable	Label	Subs_Rate	INITIAL_RETURN
Subs_Rate	Subs_Rate	1.0000	0.2191
INITIAL_RETURN	INITIAL RETURN	0.2191	1.0000

Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.33158	0.33158	1.11	0.3037
Error	22	6.57735	0.29897		
Corrected Total	23	6.90893			

R-Suare

Root MSE	0.54678	R-Square	0.0480
Dependent Mean	0.40277	Adj R-Sq	0.0047
Coeff Var	135.75648		

Parameter Estimates						
Variable	Label	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	Intercept	1	0.21346	0.21159	1.01	0.3240
Subs_Rate	Subs_Rate	1	0.06504	0.06176	1.05	0.3037

2. Quadratic Regression Model Findings Summary

ANOVA Tables

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	1.54392478	0.77196239	3.02	0.0703
Error	21	5.36500375	0.25547637		
Corrected Total	23	6.90892853			

R-Square	INITIAL_RETURN Mean
0.223468	0.402767

Source	DF	Type I SS	Mean Square	F Value	Pr > F
Subs_Rate	1	0.33157981	0.33157981	1.30	0.2674
Subs_Rate*Subs_Rate	1	1.21234497	1.21234497	4.75	0.0409

Source	DF	Type III SS	Mean Square	F Value	Pr > F
Subs_Rate	1	1.49118874	1.49118874	5.84	0.0249
Subs_Rate*Subs_Rate	1	1.21234497	1.21234497	4.75	0.0409

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	-.3457472740	0.32272933	-1.07	0.2962
Subs_Rate	0.4728642719	0.19572467	2.42	0.0249
Subs_Rate*Subs_Rate	-.0534871521	0.02455341	-2.18	0.0409