

# **MEDIUM TERM PERFORMANCE OF THE INITIAL PUBLIC OFFERING AT NAIROBI STOCK EXCHANGE**

Presented  
By:

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**D61/P /7223/03**

**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL  
FULFILMENT OF THE REQUIREMENT OF THE AWARD OF THE  
DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF  
BUSINESS, UNIVERSITY OF NAIROBI**

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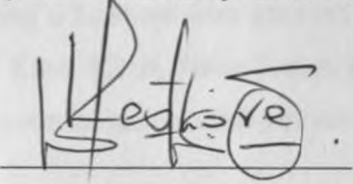
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**NOVEMBER, 2008**

## DECLARATION

I, the undersigned, declare that this is my original work and has not been submitted for a degree in this or any other University for examination.

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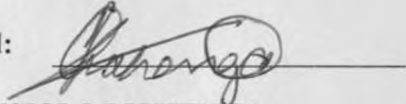
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This project has been presented for examination with our approval as the appointed supervisor.

Signed:



Mr. LUSIOLO LISHENGA  
(Supervisor)

18-11-08

Date

## DEDICATION

I dedicate this project to my wife Pauline M. Leshore and sons; Basbi Lemayan Leshore and Edwin Saning'o Leshore who gave me encouragement throughout this research process. To my classmates Kibet Kirui, James Letaro and Margaret Ndirangu, I say a big thank you for your moral and material support that you accorded me during the research process.

All praise goes to our Almighty Father.

## ABSTRACT

The aim of the study is to test for the existence of IPO under pricing anomaly at the NSE. The central hypothesis under investigation in this study is that IPOs are usually under priced in the short run. The best-known pattern associated with the process of going public is the frequent incidence of large initial returns to investors in IPOs of common stock.

The research methodology was based on an event study. This design is valuable for detailed analysis. The sample that was used in this study comprised of 18 companies, which issued and listed their shares at the Nairobi Stock Exchange between 1 January 1994 and 31 July 2007. The primary source of data was the NSE's IPO Database. The prices of the new issues at their launch and their respective prices at the end of first day, the fifth day, the tenth day, the fifteenth day, the twentieth day, the twenty fifth day and thirtieth day of trading were recorded. The daily prices were obtained from NSE's IPO Trading Database. A total of 18 companies were listed during the period under study.

From the findings one can safely conclude that the 18 IPOs show a first day return ranging from -0.30276 to a high of 1.40399. HFCK Company shows the highest first day total return of 1.22476 followed by KenGen Company. Only Athi River Mining Company reported a negative first day total return of -0.30276.



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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

One of the most important events in the life of a firm and one of particular interest to institutional investors is the transition from being a private company to a public one through the initial public offerings (IPO) process. Initial Public Offering is the first sale of stock by a company to the public (Ritter, 1991). In the United States, an IPO (initial public offering) is a first and one-time only sale of publicly tradable stock shares in a company that has previously been owned privately. An IPO is also sometimes known as "going public." Technically, an IPO is the offering to sell but virtually all IPO's result in all the stock offered being sold. IPO's are generally managed by companies that specialize in handling IPO's and have experience in determining what the likely IPO offering price should be. If the IPO manager determines that the stock will not sell at an offering price that is acceptable to the company, the application for an IPO is usually withdrawn until a better time. As soon as all shares of an IPO have been sold, the stock is now tradable through stock exchanges or specialists that trade in the stock and the stock price may go up or down (Ibboston and Ritter, 2001).

Going public marks an important watershed in the life of a young company. It provides access to public equity capital and so may lower the cost of funding the company's operations and investments. It also provides a venue for trading the company's shares, enabling its existing shareholders to diversify their investments and to crystallize their capital gains from backing the company – an important consideration for venture capitalists (Brennan, and Franks, 1997). The act of going public itself shines a spotlight on the company, and the attendant publicity may bring indirect benefits, such as attracting a different calibre of manager. At the same time, the company acquires new obligations in the form of transparency and disclosure requirements, and becomes accountable to a larger group of relatively anonymous shareholders who will tend to vote with their feet (by selling the shares) rather than assist the company's decision-makers in the way a venture capitalist might. Most companies that go public do so via an initial public offering of shares to investors.

A large volume of research has demonstrated that investors purchasing initial public offerings (IPO's) of common stocks earn a large positive abnormal return in the early aftermarket period.



For example, using U.S. data from 1980 to 2001, Welch and Ritter (2002) report that, at the end of the first day of trading, IPO's traded at 18.6% (on average) above the price at which the company sold them. However, researchers Lee, Taylor and Walter (1995) have documented that the gains from early price appreciation are not sufficient to compensate the losses that occur throughout subsequent price declines. Short-run under pricing is the positive return that a shareholder can achieve when a new public share is brought at its offering price and sold at its closing day price or within a few days or weeks after the closing of the offering. It refers to the widespread observation that regardless of the method of coming to market, IPO's tend to yield substantial returns in the days immediately following the issue. Initial public offerings (IPO's) are generally under priced in the short-run and under performers in the long run.

The under pricing phenomenon has been well documented in the US market, for example, by Miller and Fisher (1987), Ritter (1984) and many others. The IPO long-term underperformance is documented by Ibbotson and Jaffe (1975), Ritter (1991), Loughran and Ritter (1995). This implies that IPO's are a good investment in the short term and become a poor investment over the long term. For example, Ritter (1991) examines a sample of new U.S. issues listed between 1975 and 1984 and finds that for a three-year holding period, IPO's underperformed a control sample of matching seasoned companies. However, Ritter and Loughran (1995) find negative long-term returns are not as significant if companies are matched. Among the factors that have been investigated are firm age and size, industry, underwriter reputation and listing exchange. Loughran et al. (1994) present the results of research (done by the authors or others) on the short-run under pricing and long run performance of IPO's in other markets.

Finally, the level of the price of the IPO (Price) is thought to have an impact on short-term IPO performance. Following the research findings on low priced stocks earning higher returns than higher priced stocks, the researcher will hypothesize that low price IPO's will outperform IPO's priced at higher levels. From this evidence, the abnormal initial returns have ranged from 6.5% observed in Canada to a high of 256.9% observed in China. Therefore, if the offering price is set too low the investors systematically overvalue IPO's on the first trading day (s)

Traditionally, IPO under pricing was explained on the basis of risk aversion on the part of underwriters, under pricing new issues greatly reduces the chances that the underwriter will end up with an under-subscribed issue with the associated losses. Investment banker's possesses

substantial information advantage over IPO issuers and can use this power to lower their risks on loss. Baron (1982) suggests that under pricing results from such vertical information asymmetry and serves to compensate the underwriter for the use of his superior information. Tonic (1988) suggests that IPO under pricing serves as a form of insurance. He demonstrates that gross under pricing serves as an efficient form of protection against legal liabilities and the associated damages to the reputations of both the investment bankers and issuers

### **1.2 Initial Public Offerings in Kenya**

During the period, 1994-2007 there have been 18 IPO's issued at the Nairobi Stock Exchange (NSE) (see Appendix 1). It is observed that at the NSE there has been over subscription of all successful IPO's (NSE, 2007). It is also noted that unlike the developed markets such as the US and European markets, most of the IPO's were made directly to the investing public as opposed to investment banks. It is during the year 2002 when the Capital Markets Authority (CMA) released guidelines for the investment banks (CMA, 2002). The Kenyans based on the subscription rates; it is evident that they have a high affinity of initial public offerings. A case in point is the KENGEN IPO, which was oversubscribed. ACCESS Kenya also followed the same cue. During its initial public offerings in 1986, Barclays Bank of Kenya recorded the highest subscription rate of 613% since the inception of the NSE in 1954. In 2001, Mumias Sugar Company recorded the lowest rate of 60% (See Appendix 1).

The establishment of NSE in 1954 is an important milestone in the development of capital markets in Kenya. The exchange has shown remarkable growth in terms of both trading volume and number of listed companies. As of the end of August 2007, with 53 listed companies, annual trading volume reached Kshs 9.25 billion, and total market capitalization stood at Kshs 811.23 billion (See Appendix 3). These figures put NSE ahead of many emerging markets in the region. While NSE is the only secondary market for trading common stock, Capital Markets Authority (CMA) was set up in 1989 as the regulatory authority for capital markets. All publicly held companies must register with CMA and obtain permission for issuing debt and equity securities. In order to be listed on NSE, corporations should have at least 15% of their shares floating, their audited financial statements should display profits in the last two years and they should accept certain disclosure requirements. It is obvious that for Kenyan corporations, most of which are closely held, family owned companies, going public would expose them to uncertainties in

governance while at the same time presenting new financing opportunities. Another group of companies that would go public are government owned firms to be privatized.

The first case of a collapsed IPO in the history of the NSE was that of the Anglo African Property Holdings Ltd. In October 2000, the company sought to strengthen the financial position by retiring residual liabilities and raise additional equity. The offer collapsed as very few investors subscribed to the shares. On the other hand, the first largest share issue in the history of the NSE was the privatization of Kenya Airways (KQ) in 1996. More than 11,000 shareholders acquired a stake in the airline. Consequently, Kenya Airways privatization team was awarded the World Bank Award for excellence for 1998 for being a model success story in the divestiture of state owned enterprise. However, the KenGen issue in 2006 has broken the record by attracting 240,000 investors with a total amount of Kshs 7.8 billion being raised.

### **1.3 Problem Statement**

Previous research on IPO's has also identified several factors or issue characteristics that are related with the level of short-term under-pricing. Some of these issues features are the firm size, market trend, size of the offer, investment banker reputation, method of intermediation, stock price range and investor type. The objective of this study is to develop a model based on these features to forecast the medium-term performance of IPO's in Nairobi Stock Exchange. To this end, the researcher will analyze the IPO's in the Nairobi stock market in the period 1994-2007 by using 18 IPO's. Attempts to explain IPO under-pricing have several empirical implications by pointing out certain features of the new issue as proxies for the arguments towards subsequent under-pricing. First among them is the size of the firm going public (Size) and the total proceeds of the IPO (Proceeds). Both Ritter (1984) and Brav and Gompers (1987) suggest that due to higher uncertainty new issues of smaller firms may have bigger discounts. Similarly larger issues in terms of total proceeds have less uncertainty; hence they are expected to be less under-priced. Kiyamaz (2000) reports significant effects of firm size and total IPO proceeds. Kiyamaz (2000) found out that IPO's of smaller firms and IPO's with smaller total proceeds are priced lower.

The correct pricing of an IPO is important to both the issuing firm and investors. In reality, the pricing of IPO's is more of an art than a science. Consequently, price changes may be expected immediately the stocks start trading. The changes have serious implications on investor strategies, be they individuals or institutions such as pension/provident funds or insurance



companies. Whereas the NSE has continued to grow over the years, it is important to look back and see how the IPO's have performed during the subsequent six months since their launch and make recommendations for future research in this area.

It is hoped that this study will initiate studies on this subject. The study is aimed at filling the void and provides evidence on the initial and medium-term performance of IPO's in Kenya.

#### **1.4 Objective of the study**

The aim of the study is to test for the existence of IPO under-pricing anomaly at the NSE.

#### **1.5 Hypothesis**

The central hypothesis under investigation in this study is that IPO's are usually under priced in the medium-term.

#### **1.6 The importance of the study**

The NSE with about 53 listed companies is a relatively small market as compared to other exchanges where a lot of research has been done. If one was to consider the annual turnover at the NSE and market capitalization, it is evident that the NSE contributes a great deal to our economy; it is for this reason that the NSE has become a focus of many finance research studies.

The study will be useful to the following:

##### **➤ Private companies**

This study will be of benefit to private companies in Kenya that may be considering listing their shares at the exchange in future. The study is aimed at adding value to other local and international studies done in the past on his subject.

##### **➤ Investors**

The study will also be useful to investors in seeing the trend and returns that IPO's yield during the first six months. As a result of this study, one would be able to see whether it is more beneficial to buy and hold shares during an initial IPO issuance or wait and buy the same in the secondary market.

## **CHAPTER TWO LITERATURE REVIEW**

### **2.1 Background**

Once a firm's capital structure has been established, it must decide how equity holders are to finance the planned growth, initially the choice is restricted to two options i.e. retained earnings or new equity. So long as the growth rate is not phenomenon, the existing shareholders can afford to finance the growth. However, if growth is dramatic there may be needed to apply to the capital market regulators for permission to make a public issue. Once permission is granted then the applying firm must furnish the regulators and prospective investors with information to enable them to appraise the investment (Lerner, 1994).

A key piece of information provided in the prospectus is the issue price. This price is determined by the management of the firm upon advice furnished by professional investment analysis. Several valuation methods are used in valuation including comparative valuation, earning valuation and net asset. But the most important consideration in valuation is the amount and uncertainty of future cash flows. A firm's potential earnings is one of the primary factors that determine the value. An IPO price is normally based on a pro-forma estimate of earnings (Lee, Shleifer, and Thaler, (1991).

While some known facts are considered, such as historical and recent earnings trends, a projection of future earnings is one of the primaries of value. These projections reflect the use of the new capital injected into the firm through the public offering.

### **2.2 The financing decision**

Achieving the goals of corporate finance requires that any corporate investment be financed appropriately. As above, since both hurdle rate and cash flows (and hence the riskiness of the firm) will be affected, the financing mix can affect the valuation. Management must therefore identify the "optimal mix" of financing – the capital structure that results in maximum value (Paul, 1997).

The sources of financing will, generally, comprise some combination of debt and equity. Financing a project through debt results in a liability that must be serviced - and hence there are cash flow implications regardless of the project's success. Equity financing is less risky in the sense of cash flow commitments, but results in a dilution of ownership and earnings. The cost of

equity is also typically higher than the cost of debt, and so equity financing may result in an increased hurdle rate, which may offset any reduction in cash flow risk. Management must also attempt to match the financing mix to the asset being financed as closely as possible, in terms of both timing and cash flows.

One of the main theories of how firms make their financing decisions is the Pecking Order Theory, which suggests that firms avoid external financing while they have internal financing available and avoid new equity financing while they can engage in new debt financing at reasonably low interest rates. Another major theory is the Trade-Off Theory in which firms are assumed to trade-off the Tax Benefits of debt with the Bankruptcy Costs of debt when making their decisions. One last theory about this decision is the Market timing hypothesis which states that firms look for the cheaper type of financing regardless of their current levels of internal resources, debt and equity (Madura, 1998).

### **2.3 Merits of going Public**

Firstly, if a company needs to raise capital, it can sell stock (equity) or it can issue bonds (debt securities). An initial equity offering can bring immediate proceeds to a company. These funds may be used for a variety of purposes including; growth and expansion, retiring existing debt, corporate marketing and development, acquisition capital and corporate diversity (Kent, 1999). Once public, a company's financing alternatives are increased. A publicly traded company can return to the public markets for additional capital via a bond or convertible bond issue or secondary equity offering. A public status can also provide favorable terms for alternative financing from public and private investors. In general, public companies have a higher valuation than private enterprises.

Secondly, to sell the stock of a private company, a stockholder must find another individual that is interested in owning the shares. This is very difficult, especially for minority positions. By going public, a company creates a market for its stock in which buyers and sellers participate. In general, stock in a public company is much more liquid than stock in a private enterprise. Liquidity is created for the investors, institutions, founders, owners and venture capital professionals. Investors of the company may be able to buy or sell the stock more readily upon completion of the public offering. This liquidity can elevate the value of the corporation. The stock's liquidity is contingent on a variety of factors including, registration rights, lock-up

restrictions and holding periods. A public company has greater opportunity to sell shares of stock to investors. Ownership of stock in a public company may help the company's principles to eliminate personal guarantees. Liquidity can also provide an investor or company owner an exit strategy, portfolio diversity, and flexibility of asset allocation (Kent, 1999).

Thirdly, many companies use stock and stock option plans to attract and retain talented employees. It is increasingly common to recruit and compensate executives with a combination of salary and stock. Stock in a public company can be issued as a performance based reward or incentive. This reward is more desirable if the stock has a public market. Stock can be instrumental in attracting and keeping key personnel. In addition, certain tax advantages are a consideration when issuing stock to an employee. Generally, capital gains taxes are lower than ordinary income taxes. Owners and employees may have specific restrictions relating to the liquidity and sale of the stock. A public offering can create a market for the company's stock. This market can result in liquidity and reward for the company's employees (Kent, 1999). A stock plan for employees demonstrates corporate good will allows employees to become partial owners in the company where they work. An allocation of ownership or division of equity can lead to increased productivity, morale and loyalty. This type of compensation is a way of connecting an employee's financial future to the company's success.

Lastly, once a company is public and the market for its stock is established, the stock can be considered as valuable as cash when acquiring other businesses (Tsai, 2003). A successful IPO can have a dramatic effect on a company's profile, perceived competitiveness and stability. This perception can lead to expanded business relationships and added confidence in the consumer. A valuation of a private company often reflects liquidity. A successful public offering will increase a company's valuation leading to a variety of opportunities for mergers and acquisitions. With the ability to raise additional capital by returning to the public markets for another offering, a public company is better able to finance a cash acquisition. A public company also has the advantage of using the market's valuation when exchanging stock in an acquisition. CMA disclosure requirements offer merger candidates the assurance of shareholder scrutiny and accurate reporting of the financial condition or solvency of the public company. Using stock to acquire another company can be easier and less expensive than other methods. Additionally, many private firms do not appear on the radar screen of potential acquirers. Being public makes it easier for other companies to notice and evaluate the firm for potential synergies.



## **2.4 Demerits of going public**

Firstly, going public requires a time commitment in setup and in statutory compliance. In addition, it will take the business owners and managers' attention away from the everyday management of the company (Zingales, 1998).

Secondly, going public requires money. You will need to pay for the time spent on compliance. In addition, you will need to pay legal counsel when setting up and maintaining the public offering.

Thirdly, there are many new legal obligations. These include keeping stockowners informed about business operations, management, legal issues, financial standing, and business costs. Company time and money will be spent dealing with these and additional compliance issues.

Lastly, gaining public shareholders may reduce a business owners control over the company. This is especially true if shareholders are given approval power over business actions.

## **2.5 Reasons for issuing equity**

At present, there are two theories and one somewhat conjectural hypothesis about why and when firms issue equity. The first is the trade-off theory, which focuses primarily on the debt side of the capital structure equation and asserts that a firm's decision about which security to issue balances the marginal costs and benefits of debt. The marginal costs include the anticipatory and direct (out-of-pocket) costs of bankruptcy and agency costs due to shareholder-debt holder conflicts. The marginal benefits include the debt tax shield and reduction of free-cash-flow problems (Zingales, 1998). The strongest prediction of this theory is that there is an optimal capital structure determined by the intersection of marginal costs and benefits of debt and, since changes in stock price will cause the firm's actual capital structure to deviate from this optimum, the firm will return to this optimum by issuing equity.

## **2.6 Determining the Issue Price**

With all the media hype surrounding the IPO, the fundamental analysis of an IPO's true market value is what really matters when it comes to making an informed IPO investment decision (Zingales, 1998). IPO valuation analysis may probably be the single most critical component of the IPO investment decision and investors who gain a good understanding of IPO valuations

could hold one of the keys to IPO investing success (Ritter, 2002). The central issue in IPOs is the determination of the offering price. Standard techniques in security analyses are used in order to approximate the correct price i.e. discounted cash flows, earning multiples or book value multiples. The output of such techniques is highly dependent on their input, which is based on the subjective opinion of the analysts.

A company's potential for earnings is one of the primary determinants of value. An IPO price is usually based on a pro-forma estimate of earnings (Zingales, 1998). While some known facts are considered, such as historical and recent earnings trends, a projection of future earnings is one of the primary components of value. These projections reflect the use of the new capital injected into the company through the public offering. The underlying assumption in the IPO pricing includes a projection of earnings based upon a successful IPO and a capital infusion into the company.

In an analysis of fair market value, the past performance of a company is typically an analysis's best evidence of expected future performance and current earning power is projected based upon past performance and future prospects. All IPO's across the globe share one characteristic- under pricing. The offering price is on average lower than the post – listing market price (Ritter, 2002).

### **2.7 Deciding when to issue**

There are clear windows of opportunity that open and close for IPO issuers (Singh, 1998). Most of what determined suitability includes the general stock market condition (e.g. the index), the industry market condition and the frequency and size of all IPO's in the financial cycle.

There is normally a 3-6 months lead-time between starting the IPO process and going public, so, the firm needs to forecast the market conditions 3-6 months later. It is therefore not a bad guess to make decisions about public on current stock market conditions. In order for a company to go public, it needs to hire the services of several professional firms. It is important for entrepreneurs to hire someone independently who understands IPO's, preferably someone who understands IPO's in the same industry.

### **2.8 The Role of Underwriters**

Carter, Dark, and Singh (1998) shows that IPO's managed by more reputable underwriters are associated with less short-run under pricing. The underwriter reputation hypothesis states that by

choosing a highly reputed investment bank as the lead manager, firms could send a credible signal to be a high value. Previous research suggests that underwriter reputation signals the underlying risks of the offering that are impounded in the immediate aftermarket return. On the one hand, investment banks must under price IPO's to maintain good relationships with their buy-side clientele, i.e., potential investors who purchase an issue. On the other hand, if investment banks under price too heavily, they will lose reputation with potential issuers. This conflict of interest in earlier work is by Beatty and Ritter (1986) and Titman and Trueman (1986). Carter, Dark, and Singh (1998) develop a new version of the reputation measure originally developed by Carter and Manaster (1994).

### **2.9 The role of Capital Markets Authority**

The CMA is a statutory body created by an Act of parliament (CAP 485A) of the laws of Kenya. The Act was enacted in 1989. The basic objective of the Act is to establish an Authority for the purpose of promoting and facilitating the development of an orderly, fair and efficient Capital Market in Kenya. The CMA has the following responsibilities:

- (a) To encourage savers to invest in securities
- (b) To encourage companies to issue securities or to go public.
- (c) To ensure fair and equal treatment of all market players.
- (d) To enforce adequate disclosure to enable the securities market to perform its key functions.

### **2.10 General Listing Requirements**

The CMA's eligibility requirements for public offering of shares and listings are:

1. The issuer shall have a minimum authorised issued and fully paid-up share capital of Kshs 50 million.
2. Net assets immediately before the public offering of shares should not be less than Kshs 100 million.
3. The issuer shall have published audited financial statements complying with International Accounting Standards (IAS) for an accounting period ending on a date not more than three months prior to the proposed date of the offer for issuers whose securities are not listed at the securities exchange and six months for issuers whose securities are listed at the securities exchange.

4. The issuer must have declared positive profits after tax attributable to shareholders in at least three of the last five years completed accounting periods to the date of the offer.

### **2.11 Pricing of an IPO**

When a firm issues stock for the first time, it is much more difficult to determine what the correct price should be (Lee, 1991). Having no previous public market, there is no stock price benchmark. Consequently, there is more uncertainty than there is when a public company sells additional stock i.e. seasonal price offerings (SPO's).

It seems that the underwriters normally set the price of an IPO. They price the IPO at a level they believe will reflect the true market value. In most cases the underwriters do not make their value calculations public information, making it difficult for investors to determine if their set-offering price is fair or accurate. There are three major parties involved in the IPO; the issuing company, the underwriter and investor's. Rock (1986) categories investors as informed and uninformed participate in the market. Though researchers in this aspect of the subject differ in method of analysis of the problem, their common view is that under pricing in IPO occurs because of differences in the level of valuable information that one has of IPO market participants possesses over others. IPO are characterized by great deal of uncertainty about their true value because of the scarcity of public information at the time of the initial offering. In such an environment, determining the true value of a new issue is obviously a difficult task. Consequently, the initial return on an IPO reveals significant information because it provides the first public indication that the markets average assessment of the IPO differ from that of the underwriter and the issuing company.

### **2.12 IPO Valuation Methodologies**

Valuation plays a central role in corporate finance for several reasons (Groth, Lewellen, Schlarbaum, and Lease, 1979). First, corporate control transactions such as hostile takeovers and management buyouts require the valuation of equity. Second, privately held corporations that need to set a price for their initial public offerings, or public firms that require further equity financing, must first establish the value of their equity. Finally, the estimated equity value is important in setting the capital structure of these issuing firms.



### **2.12.1 Comparative Valuation-**

This involves looking at comparative companies that are public and in the business. Here, the comparison is made on earning per share (EPS), market share, size of business, price-earning multiples etc

### **2.12.2 Earnings Valuation**

This involves analyzing the profits of the company at that particular time and the previous years (May be 5 years). Projections of profits in the coming years are made for about 10 years. The profits are then discounted to the present value and then a price is fixed at par.

### **2.12.3 Net Asset Valuation**

This involves the valuation of the firm's financial tangible and intangible assets. Based on their value, a price is fixed after deducting liability claims. Their valuation necessary requires the involvement of the relevant valuations experts.

## **2.13 Methods of issuing IPO's**

There are three common methods globally for issuing IPO's –1) public offer (also referred to as fixed price, open offer or universal offer) in which the issue price is first set, and then orders are taken from investors who typically pay in advance for part or all of the shares that are ordered; 2) Book building. Under this method, underwriters do road shows and take nonbinding orders from investors before setting the issue price. The underwriter has substantial control over allocations and tends, in practice, to favor regular investors and investors that provide information (Cornelli and Goldreich, 2001); and 3) a tender or auction in which allocations are based on current bids, without regard to any past relationship between certain bidders and the auctioneer

The public offer method normally includes "fairness rules" which limit discrimination. It is the ability to allocate shares freely that makes "book building" (the advance gathering of indications of interest) possible. Under an auction or public offer system, underwriters are free to do road shows and to solicit for indications of interest. However, without the ability to make allocations dependent on the information reported, there is no way for underwriters to give investors the incentive to accurately report their information. Hybrid offerings, with separate tranches using different methods, are common. There have been hybrid auction/public offer and auction/book building IPOs, but by far the most common combination is book building/public offer. For most hybrids, book building is used to set the price and to allocate shares to institutional and foreign

investors, while a public offer tranche is reserved for local retail investors who do not participate in the price-setting process.

#### **2.14 Performance of IPO**

Because of the need to raise finance at the crucial stage in the growth of companies, it is important that prices of their shares reflect the true value of company assets and growth potential. In particular, if their shares are sold too cheaply, these firms will have raised less capital than was warranted by the intensive values of their assets. In other words their shares will have been under priced (Groth, 1999).

IPO's have interested financial economists for many decades. Early writers, notably Logue (1973) and Ibbotson (1975), documented that when companies go public, the shares they sell tend to be under priced, in that the share price jumps substantially on the first day of trading. Since the 1960s, this 'under pricing discount' has averaged around 19% in the United States, suggesting that firms leave considerable amounts of money on the table. Under pricing has tended to fluctuate a great deal, averaging 21% in the 1960s, 12% in the 1970s, 16% in the 1980s, 21% in the 1994s, and 40% in the four years since 2000 (reflecting mostly the tail-end of the late 1994s internet boom). Clearly, under pricing is costly to a firm's owners: shares sold for personal account are sold at too low a price, while the value of shares retained after the IPO is diluted. In dollar terms, IPO firms appear to leave many billions 'on the table' every year in the U.S. IPO market alone. The IPO provides a fresh source of capital that is critical to the growth of the firm and provides the founder and other shareholders a liquid market for their shares. From an institutional investor's point of view, the IPO provides an opportunity to share in the rewards of the growth of the firm.

Short-run under pricing is the positive return that a shareholder can achieve when a new public share is brought at its offering price and sold at its closing day price or within a few days or weeks after the closing of the offering. It refers to the widespread observation that regardless of the method of coming to market, IPO's tend to yield substantial returns in the days immediately following the issue.

A common perception is that the under pricing of IPO's is a challenge to market efficiency, and that may hurt emerging firms trying to raise capital for expansion (Loughran *et al.*, 1994). A number of theories of IPO under pricing have been put forward and tested against the data of

various stock markets. Ibbotson *et al.* (1988) found that the average first-day IPO return was 16.3 percent in the years 1960-1987 in the US market. Levis (1994) studied a sample of 123 offers for sale on the London Stock Exchange for the period 1985 to 1988 and found that on average the market-adjusted discount was 8.6% on the first day of trading. Loughran *et al.* (1994) also confirmed that this IPO under pricing phenomenon exists in 25 countries studied by them, with higher IPO under pricing in developing markets than in developed markets.

### **2.15 Short –run Performance**

Considerable evidence shows that new or initial public equity offerings are under priced on average. That is the prices of firms shares offered to the public for the first time are on average set below prices investors appear willing to pay when the stocks start trading in the secondary market, Jumba (2002) in her study concluded that IPO are deliberately under priced in the market leading to initial high returns. In her study she reported that all IPO's registered initial high returns in comparison to the market return for the same period. She also found that the average daily returns for a sample of 9 IPO's were 0.6% in the three years after going public. In addition, Maina (2004) in his study found out that the first day return of 14 IPO's (1984 – 2001) obtained a mean underlying return of 22.5% with a standard deviation of 24.09. He concluded that this shows that IPO's are generally under-priced at the offer stage as their prices go up significantly in their first day of trading at the stock market.

Tim Loughran, Jay Ritter and Kristian Rydqvist have provided international evidence of the under pricing phenomenon for 44 countries from various sources as reproduced in appendix 5. From this evidence, the abnormal initial returns have ranged from 6.5% observed in Canada to a high of 256.9% observed in China. Therefore, either the offering price is set too low or the investors systematically overvalue IPO's on the first trading day(s).

To date, no complete explanation of the under pricing phenomenon exists, though various theories based on different rationales shed light on the factors that may influence, with different theories focusing on various aspects of the relations between investors, issuers and the investment bankers taking the firms public. First; winners curse (Rock 1986), second; costly information acquisition hypothesis (Benveniste & Pindt, 1989), third; cascades hypothesis (Welsh, 1992) and fourth; the investment banker's monopsony hypothesis (Baron & Holmstrom 1980 and Baron, 1982) and others. These theories are discussed in detail later in this chapter.

Traditionally, IPO under pricing was explained based on risk aversion on the part of underwriters. Under pricing new issues greatly reduces the chances that the underwriter will end up with an under-subscribed issue with the associated losses. Investment bankers possess substantial information advantage over IPO issuers and can use this power to lower their risks or loss. Baron (1982) suggests that under pricing results from such vertical information asymmetry and serves to compensate the underwriter for the use of his superior information. Tonic (1988) suggests that IPO under pricing serves as a form of insurance. He demonstrates that gross under pricing serves as an efficient form of protection against legal liabilities and the associated damages to the reputations of both the investment bankers and the issuers.

Another model is by Rock (1986) that applies the concept of the winners curse to the new issues market. It is based on horizontal asymmetry of information specified to exist between different groups of investors. He specifies that there are two groups of potential investors in the market, called 'informed and "Uninformed'. Large investors are more likely to possess further information about the company, thus they are expected to invest in under priced issues more often, Rock (1986). When an investor or group of investors subscribes to more than 10% of the issue it is regarded as the presence of a large investor. Following a similar line of reasoning, presence of a foreign investor is another feature that may influence the pricing of a new issue (Foreign). Since foreign investors employ the services of reputable professional analysts, they will also subscribe to under priced issues more often than ordinary investors will.

Shares of companies going public for the first time are typically at a price below that achieved on their first day trading subscribing investor's large positive returns. There is widespread observation that regardless of the method of coming to market, IPO tend to yield substantial returns in the days and sometimes weeks immediately following the issue. Loughran, Ritter and Rydqvist, initial public offerings: International insights 1994 and updated in 2002 have provided international evidence on this phenomenon (see Appendix 5).

These empirical studies look at the stock price performance immediately (a few days or weeks) after the issue. Numerous studies have been undertaken since the pioneering works of Ibbotson. Ibbotson (1975) was among the first to report on the so called "under pricing of IPO's by documenting initial excess returns of 11.44% on US common stocks of IPO on the first day of



trading. Levis (1993) reported an average first day return of 14.3% for 712 UK IPO during the period 1980 to 1988. Graves (1995) examined the performance of 2096 US IPO's during the period 1975 to 1991 and found out that the IPO's outperformed matched firms of the same size by 6.4 % over the first three months of trading. Stoll and Curly (1970) found significant positive short-term returns for their sample of 205 small offerings as do Chalk and Pevey (1987) for 649 IPO's in the first six months following the offering.

Lee, Taylor and Walter (1996) investigate initial and long-run returns for Singaporean IPO during the period of 1973-1993. They reported initial returns of 30%, which is positively related to the level of over subscription and retained ownership. In another paper, Lee Taylor & Walter (1996) studied the price performance of 266 Australian Industrial firms during the period 1976 to 1989 and found an overpricing of over 11.8% on the first day the stocks started trading. Ritter (1997), Welsh (1989) Ibboston et al (1994) and Rajan and Servaes (1997) among others provided evidence suggesting that the existence of average initial returns of up to 16% regular feature of the US new issues market. Lee et al (1994), Jacquillat (1986) Kaneko and Pettway (1994) and Ljungqvist (1997) among others provided evidence of abnormal returns of up to 14% in the developed markets of the world such as Australia, France, Japan and Germany. Aggarwal, Leal and Hermandex (1993) examines the performance of IPO's in short and long -run based on sample of 62 Brazillian IPO's (during 1980-1990), 36 Chilean IPO's (1982-1994) and 44 Mexican IPO's (1978-1994). Results indicate that initial one-day returns are found to be 78.5%, 16.3% and 2.8% for Brazil, Chile and Mexico respectively.

In a study paper on IPO's (evidence from the British, French and Swedish Property share market) by Dirk Brounen and Piet Eichholtz on 54 European property share companies, IPO - outperformed the benchmark on the first day of trading on average with 25% returns. Janice How in her paper initial and Long -run Performance of Mining IPO's in Australia, for mining IPO's issued during the period 1979 to 1994 shows an average under pricing of 107.18%. Giancarlo, Giudici and Stefano Paearl (2001) have also provided evidence of initial under pricing using data from 169 listed companies at the Italian Stock Exchange for the period 1985-1999. They found positive under pricing of 23.58%

Therefore, either the offering price is set too low or the investors systematically overvalue IPO's on the first day of trading. One of the anomalies associated with the process of going public is

the frequent indulgence of large initial returns (The price change measured for the offering price to the market price within a few weeks of the following date) accruing to investors in IPO's of common stock

## **2.16 Reasons for new issue under pricing**

A number of reasons have been advanced for the new issues under pricing phenomenon, with different theories focusing on various aspects of the relationship between investors, issuers and the investment banks taking the firm public. Most of the theoretical models explaining IPO initial returns share three features:

- 1) Imperfect information and agency costs among firms, intermediaries and investors,
- 2) Choice and Institutional setting of introduction procedure and
- 3) Investors over-optimism in hot-issue markets.

A common explanation for the abnormal first-day price behavior of public shares is the –so called winners curse” According to Rocks (1986) model, the IPO market contains two investor's types; well-informed investors and uninformed, who lack special knowledge to correctly value the issue. This information asymmetry causes a ‘lemons problem’ where the uninformed investors are left with the less successful IPO's. In order to keep badly informed investors interested in the IPO market, issuing firms are required to sell their shares at a discount. An explanatory fact directly derived from this winners curse is the sizes of the issues. The larger the issue the more professionally it is likely to be managed and the more information about the true value will be available. This wider spread of information decreases the information asymmetry among investors. Because of this lower information asymmetry, these larger IPO's have less reason to under price and are expected to show less initial out-performance.

A second factor that might explain the abnormal price behavior of IPO's is the degree of debt financing. Smith and Watts (1992) argued that a firm with high growth potential will rely less on debt financing. This low reliance on debt financing is caused by their higher profiles, which make the debt market less accessible. When these growth companies go to the stock market during an IPO, the public will consider them more risky and will demand a higher risk premium in the form of under pricing.

Another issue related to the under pricing of IPO is the amount of uncertainty concerning the true value of the company involved. Alli Yau and Young (1994) have examined this relationship by

studying initial aftermath price behavior of financial institutions, since financial institutions asymmetry problem and uncertainty regarding true value should be less severe for financial institutions than for non-financial institutions.

## **2.17 Theories for under pricing of IPO's**

### **2.17.1. The winner's Curse Hypothesis**

The key parties to an IPO transaction are the issuing firm, the bank underwriting and marketing the deal, and the investors buying the stock. Asymmetric information models of under pricing assume that one of these parties knows more than the others. Perhaps the best-known asymmetric information model is Rock's (1986) winner's curse, which is an application of Akerlof's (1970) lemons problem. Rock assumes that some investors are better informed about the true value of the shares on offer than are investors in general, the issuing firm, or its underwriting bank. Informed investors bid only for attractively priced IPO's, whereas the uninformed bid indiscriminately. This imposes a 'winner's curse' on uninformed investors. In unattractive offerings, they receive all the shares they have bid for, while in attractive offerings, their demand is partly crowded out by the informed investors. In the extreme case, the uninformed investors are rationed completely in under priced IPO's and receive 100 percent allocations in overpriced IPO's, resulting in average returns that are negative.

When conditional expected returns are negative, uninformed investors will be unwilling to bid for IPO allocations, so the IPO market will be populated only with (equally) informed investors. Rock (1986) assumes that the primary market is dependent on the continued participation of uninformed investors, in the sense that informed demand is insufficient to take up all shares on offer even in attractive offerings. This requires that conditional expected returns are non-negative so that the uninformed at least break even. In other words, all IPO's must be under priced in expectation. This does not remove the allocation bias against the uninformed – informed investors in the most under priced offerings will still crowd them out – but they will no longer (expect to) make losses on average, even adjusted for rationing.

For simplicity, Rock (1986) groups all investors into two categories: perfectly informed and completely uninformed with respect to knowledge of the future market price of the shares being sold. In the model, informed investors will only attempt to buy shares when an issue is under priced. Uninformed investors on the other hand, do not know which issues will be under priced

or overpriced and so will be allocated only a fraction of the most desirable new issues while they are allocated all of the least desirable new issues.

Numerous studies have attempted to test Rocks winners curse model, both for the US and other countries. A cross-sectional implication of the model developed in Beatty & Ritter (1986), is that riskier issues should have greater under pricing on average. While the evidence is consistent with this prediction, other explanation of the under pricing phenomenon also make this prediction. A direct test of the model by Koc & Walter (1989) using data from Singapore supported the model.

### **2.17.2 The Costly Information Acquisition Hypothesis**

Welch (1992) presents an equilibrium model in which he argues that the IPO market is subject to cascades. 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 that no one else wants to buy, he may decide not to buy even when he has favorable information (Welch, 1992). 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.

### **2.17.3 The Information Asymmetry Hypothesis**

This hypothesis focuses on information asymmetries between issuing firms and their investment bankers, Baron & Holmstrom (1980) and Baron (1982) hypothesis that investment bankers take advantage of their superior knowledge of market condition to under price offerings, which permits them to expand 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 for IPO shares than the issuers, because they possess greater information about investor demand for the securities. In addition, underwriter have an incentive to recommend an offering price below the true market value to reduce the marketing effort and to avoid unsold shares.

### **2.17.4 The Lawsuit Avoidance Hypothesis**

Since the U.S Securities Act of 1933 makes all participants in 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. Tonic (1988) develops this hypothesis, and presents evidence that is consistent with it.

#### **2.17.5 The Signaling Hypothesis**

Under priced new issues leave a good taste with investors allowing the firms interested to sell future offering at a higher price than would otherwise be the case. This reputation argument has been formalized in signalling models by Allen & Faulhaber (1989) Welch (1989) and Grinblatt & Hwang (1989). In these Models issuing firms have private information about whether they have high or low values. They follow a dynamic issue strategy, in which a seasoned offering will follow the IPO. 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's will have little consequence for the seasoned offering.

#### **2.17.6. The Stabilization Hypotheses**

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 aftermarket in an effort to prevent the price from falling.

#### **2.17.7. The Ownership Dispersion Hypothesis**

Issuing firms may intentionally under price their shares in order to generate excess demand and be able to have large number of small shareholders. The disperse ownership will both increase the liquidity of the market for the stock, and make it more difficult for outsiders to challenge management.

### **2.18 Long-run Performance**

A large body of evidence shows that on average, IPO underperforms in the aftermarket i.e. aftermarket hype. Lounghran et al (1994) provide international evidence on this long-run underperformance.

Jumba (2002) reported an average daily return of 0.06% for a sample of nine IPOs (1992- 2000) in the three years after going public. According to her study, a market model of the index consistent companies produced an average daily return of 0.3% over the same three –year period.

Aggrawal and Rivoli (1990) attribute underperformance to a temporary overvaluation of the IPO Company at the offering date, the so-called facts theory. After a while the over optimism disappears and the value of the new shares will be downwardly. Ritter (1991) has further advanced the fads theory and showed that IPO firms with a high risk profile (young, smaller and active in certain sector) are sooner subject to shareholder sentiment: the so called fads of the stock market. Loughran and Ritter(1995) find evidence that underperformance in the long-run is the result of the utilization of windows of opportunity by the issuer and the lead manager. Companies for public at the moment of relative overvaluation i.e. high market-to book ratio.

If after a while those firms do not live up to their expectations their value will be adjusted downwards, based on the provided information investors initially overvalue the issue. If the company is not able to fulfill the expectations after going public investors will re-value their positions, which will cause the stock price to fall.

Levis (1993) reports in a study of 712 UK firms during the period 1980 to 1988 a long run underperformance of 11.4% 3 years after issue of the stocks Levis confirms Ratters (1991) finding of statistically significant long-run IPO underperformance, although he notes that average underperformance in his UK sample appears to be less excessive than in Ritter's US sample.

Lee Taylor et al (1996) in a study of 266 Australian industrial firms found out that the stocks underperformed the market by 51% in the 3-year period subsequent to the listing. Lee Taylor et al (1996) in Singapore study covering the period 1973 to 1993 failed to detect any significant underperformance.

Buser & Chan (1987) find a mean 2-year adjusted return of 11.2% for 1078 NASDAQ/NMS IPO's in 1981-1985. Ritter (1984) & Sterns Bornstein (1985) provide evidence suggestive of negative aftermath performance Ritter (1991) finds a significant mean market-adjusted return - 24.33% at the end of 3<sup>rd</sup> year following the offering for a sample of 1526 IPO's over the period 1975 to 1984. However, this result appears to be time sensitive; mean three-year aftermarket returns are positive for 1975-1980 IPO's and negative for 1981 1984 IPO's

Aggrarwal and Ravioli (1990) similarly find negative aftermath performance of 13.73% in the first year following the initial offering for 1435 IPO's in the period 1977-1987 and so do Carter

and Dark (1990) who finds a significant average return of -8.3% over the first 18 months for sample of 927 IPO's over the period 1979-1984. Loughran (1993) further documents that such underperforming extends for five years following initial offering. Similar underperformance has been documented in many other markets, including London (Levis 1993) and Latin America (Aggrawal, Leal and Harmandez, 1993).

Arif et al (1999), using IPO's listed on the London Main Market from 1991-1998 have documented a long-run underperformance of 17.81%. They have also found that the pre-IPO performance of a firm has significant effect on the long run, for example, they found a significant relationship between the long-run performance and their first day return.

Loughran and Ritter (1995) have documented long-term underperformance for up to five years following seasoned equity offerings. John Affleck-Grave (1995) found that IPO's that were initially under priced outperformed matched firms by 6.4% over the first three months of trading. By contrast, IPO's, which were initially, overpriced underperformed, matched firms of the same size by an average of 4.42% over the first month of trading. Subsequently, overpriced IPO's earned a similar negative abnormal returns implying gross underperformance in the long run. Dirk-Brounen and Piet Eichholtz in a study of 54 European property shares IPO's which became publicly listed during the period 1984-1999, found that the IPO's tended to under perform their benchmark over the twelve-month period subsequent to their initial offering.

Arosio et al (2001) found in their study of Italian IPO's that if an individual purchased the average IPO on the first listing and sold it at any time till the 6<sup>th</sup> year of listings they would earn on average a negative market adjusted return.

Stele et al (2000) consider long-run IPO performance in Germany using buy and hold abnormal returns; they found that consistent with Ljungqvist (1997). German IPO's under perform similar sized companies by about 6% in the three year post listing

Dr. Halil Kiyamaz in his study, long Run performance of IPO's: Case of Istanbul Stock Exchange has also provided further evidence of long-run underperformance of IPO's. His sample considered of 138 firms listed and traded on the Istanbul Stock Exchange during the period 1990-1995. He reported that the Turkish IPO's are under priced on initial trading day on average of 13.6%.

## **2.19 Theories for long –run Underperformance**

The following three theories have been advanced to explain the phenomenon of the long –run underperformance of IPO

### **2.19.1 The divergence of opinion Hypothesis**

Miller (1977) argues that investors who are most optimistic about an IPO will be the buyers .If there is a great deal of uncertainty about the value of an IPO the valuations of optimistic investors may be much higher than those of pessimistic investors. As time goes on and more information becomes available, the divergence opinion between optimistic and pessimistic investors will narrow and consequently, the market will drop, thus miller predicts that IPO's will under perform in the long run.

### **2.19.2 The Impresario hypothesis**

Shiller (1990) presents an impresario hypothesis in which he argues that the market for IPO is subjected to fads and that IPO's under priced by investment bankers (the impresarios) to create the appearance of excess demand. Shiller's hypothesis predicts that companies with the highest initial returns should have the lowest subsequent returns. There is some evidence of the relations in Ritter (1991)

### **2.19.3 The windows of opportunity hypothesis**

If there are periods when investors are especially optimistic about the growth potential of companies going public, the large cycle in volume may represent a response by firms attempting to time their IPO's to take advantage of these swings in investor's sentiment

Ritter (1991) and Loughran & Ritter (1995) argue that the low–run returns on IPO's are consistent with issuers taking advantage of windows of opportunity in which the market is willing to overpay for their equity. The windows of opportunity frameworks predicts that there will be a low long-run returns on firms conducting IPO's and on firms conducting seasoned equity offerings. Loughran & Ritter (1995) provide evidence that this is indeed the case. Mixed results for long-term performance exist, with many countries showing underperformance. Hence evidence for long run performance is not conclusive. The implication of long run underperformance of IPO's mean that the share holders of thesis shares who hold them over a long time loose value through time.



## **2.20 The IPO Cycles**

There is existing evidence on the determinants of the fluctuations of IPO volume and the fluctuations in initial returns individually. Several possible explanations have been suggested for the cyclical pattern in each of these series.

### **2.20.1 IPO Volume**

Lowry (2001) shows that the observed fluctuations in IPO volume are related to three factors: changes in private firms' aggregate demand for capital, changes in the adverse selection costs of issuing equity, and variation in investor optimism. More companies tend to raise public equity for the first time when private firms' total demands for capital are higher, the adverse selection costs of issuing equity are lower, and investors are especially optimistic and therefore willing to overpay for IPO firms. Lee and Henderson (1999), Bayless and Chaplinsky (1996), Choe, Masulis, and Nanda (1993), Rajan and Servaes (1997), Lee, Shleifer and Thaler (1991), Helwege and Liang (1996), Pagano, Panetta, and Zingales (1998), and Cook, Jarrell, and Kieschnick (1999) provide additional evidence that equity issuance is related to one or more of the above factors.

More generally, both Persons and Warther's (1997) and Stoughton, Wong, and Zechner's (2000) models suggest that the cycles in IPO volume are potentially consistent with efficient markets and do not necessarily reflect irrational bubbles. Persons and Warther show that if firms rationally condition their decision to go public on the outcome of recent IPO's, then we may observe clustering of IPO's in certain periods. Stoughton, Wong, and Zechner posit that the clustering of IPO's is the result of information effects. One firm's IPO provides information about industry prospects, thus causing many similar companies to go public soon after.

### **2.20.2 Initial Returns**

Variation in average IPO initial returns can also be caused by a number of different factors. Ritter (1984) finds that underwriter monopsony power and differences in the average risk of companies going public are important. Specifically, the higher average initial returns during the early 1980s were driven by a large number of small, risky, natural resource companies going public and by the underwriters of these IPO's systematically pricing them far below their subsequent market value. In addition, Ritter (1991) provides evidence that investor over-reaction during certain periods contributes to the fluctuations in initial returns. When investors are overoptimistic, they bid up the after-market price of the IPO firms, resulting in especially high

initial returns. Finally, Loughran and Ritter's (2000) prospect theory explanation says that initial returns are related to public information that becomes available during the registration period. Such information is only partially incorporated into the offer price, meaning that offerings whose registration periods coincide with periods of high market-wide returns will tend to be especially under priced. Because the registration periods of IPO are close to one another in time overlap, this generates cycles in initial returns.

### **2.20.3 Information Spillover and IPO Cycles**

Neither changes in the average risk of companies going public nor time-variation in underwriter monopsony power seem likely to cause initial returns to be related to subsequent or lagged IPO volume. However, suppose that initial returns are related to some value-relevant information. For example, Loughran and Ritter (2000) find that initial returns are related to public information learned during the registration period, and Hanley (1993) finds that initial returns are related to private information learned in this same period. In addition, van Bommel and Vermaelen (2000) find that firms with higher first-day returns spend more money on investment after the IPO, suggesting that initial returns are positively related to the market's assessment of the firm's prospects. In a similar spirit, Stoughton, Wong, and Zechner (2000) show that firms with higher first-day returns should gain larger market share in the product market. Consistent with Stoughton, Wong, and Zechner's predictions, Ward (1997) finds that when a firm announces an IPO, the stock price reactions of competitor firms are strongly negatively correlated with the IPO firm's eventual under pricing. Benveniste, Busaba, and Wilhelm (2000) note that the information produced by firms that go public influences not only their own production decisions but also those of their rivals. Consistent with this idea, Benveniste, Wilhelm, and Yu (1999) find that issuing firms structure their IPO's conditional on various features of recent offerings. If high initial returns indicate that private companies can raise more money in an IPO than they previously thought, then these prior findings suggest that high initial returns should be followed by periods of high volume. Information spillovers can similarly explain the negative relation between IPO volume and subsequent initial returns. As more firms go public, companies have better information about how much money they can expect to raise in an IPO. Thus, the uncertainty surrounding the true value of these companies decreases, and average initial returns decrease.

## **2.21 Evidence of IPO's under pricing.**

Under pricing is estimated as the percentage difference between the price at which the IPO shares were sold to investors (the offer price) and the price at which the shares subsequently trade in the market (Emillsen, 1991). In well-developed capital markets and in the absence of restrictions on how much prices are allowed to fluctuate from day to day, the full extent of under pricing is evident fairly quickly, certainly by the end of the first day of trading and so most studies use the first-day closing price when computing initial under pricing returns. Using later prices, say at the end of the first week of trading, typically makes little difference. In less developed capital markets, or in the presence of 'daily volatility limits' restricting price fluctuations, aftermarket prices may take some time before they equilibrate supply and demand. The Athens Stock Exchange, for instance, specified daily volatility limits of plus or minus eight percent during the 1994s. Thus for many under priced IPO's, the first-day return would equal 8% by force of regulation. In such cases, it makes more sense to measure under pricing over a longer window.

In the U.S. and increasingly in Europe, the offer price is set just days (or even more typically, hours) before trading on the stock market begins (Isa and Young, 1998). This means that market movements between pricing and trading are negligible and so usually ignored. But in some countries (for instance, Taiwan and Finland), there are substantial delays between pricing and trading, and so it makes sense to adjust the estimate of under pricing for interim market movements. As an alternative to computing percentage initial returns, under pricing can also be measured as the (dollar) amount of 'money left on the table'. This is defined as the difference between the aftermarket trading price and the offer price, multiplied by the number of shares sold at the IPO (Aussenegg, 1999). The implicit assumption in this calculation is that shares sold at the offer price could have been sold at the aftermarket trading price instead, that is, the aftermarket demand is price-inelastic. Appendix 5 provides evidence of under pricing in a range of countries. The U.S. probably has the most active IPO market in the world, the number of companies going public and by the aggregate amount of capital raised. Over long periods of time, under pricing in the U.S. averages between 10 and 20 percent, but as Appendix 3 shows, there is a substantial degree of variation over time. There are occasional periods when the average IPO is overpriced, and there are (more frequent) periods when waves of companies go public at quite substantial discounts to their aftermarket trading value. In 1999 and 2000 for instance, the average IPO was under priced by 71% and 57% respectively. In dollar terms, U.S.

issuers left an aggregate of \$62 billion on the table in those two years alone. Such periods are often called 'hot issue markets'. Given these vast amounts of money left on the table, it is surprising that issuers appear to put so little pressure on underwriters to change the way IPO's are priced.

### 2.22 Concluding Remarks

The empirical IPO literature is now fairly mature. We know that IPO's are under priced in virtually all countries and that the number of companies going public and the extent of under pricing fluctuate over time. There is a large body of theoretical work explaining IPO under pricing, and most theories have been subjected to rigorous empirical testing. Broadly speaking, the empirical evidence supports the view that information frictions (including agency conflicts between the issuing company and its investment bank) have a first-order effect on under pricing.



## CHAPTER THREE RESEARCH METHODOLOGY

### 3.1 Research Design

This research is an event study on companies which issued IPO'S and listed at the NSE. This method is chosen because it enables the researcher to probe and obtain an in-depth understanding of a case such as the NSE. This design is valuable for detailed analysis. Young, (1960) and Kothari, (1990) concur that a case study often provides focused and valuable insights to a phenomena that may be vaguely known and less understood.

### 3.2 The population of the study

The sample that was used in this study comprised 18 companies, which issued and listed their shares at the Nairobi Stock Exchange between 1 January 1994 and 31 July 2007. The primary source of data was the NSE IPO's Database. The prices of the new issues at their launch and their respective prices at the end of first day, the fifth day, the tenth day, the fifteenth day, the twentieth day, the twenty fifth day and thirtieth day of trading will be recorded. The daily prices were obtained from NSE IPO's Trading Database. A total of 18 companies were listed during the period under study. However, three IPOs were seasonal equities thus leaving out 15 IPOs for analysis and interpretation purposes.

For the evaluation, data was collected for all the 15 companies regarding share price index, total turnover value (in Kshs) and market capitalization (in Kshs)

### 3.3 IPO Under pricing

#### 3.3.1 Empirical methodology

To examine the amount of under pricing, the researcher calculated market-adjusted initial returns. Following previous research, the initial return period covers the first day of trading, i.e., it relates the first closing price to the offering price of an issue. Benchmark-adjusted returns are calculated as the raw return on a stock minus the benchmark return over the first day of trading as applied by (Carter etal, 1998).

The total stock return for stock 'k' at the end of the first trading day has been calculated as:

$$R_{i,k} = \ln(P_{i,1} / P_{i,0}) \text{-----(1)}$$

Where:

- $R_{i,1}$  -Total first day return on the stock
- $P_{i,1}$  - Price of stock, k at the close of the first trading day at the first trading day,
- $P_{i,0}$  -Is the offering price.

On the other hand, the return on the market index during the same period has been computed as:

$$R_{i,k} = \ln(I_{m,i} / I_{m,o}) \text{-----}(2)$$

Where:

- $R_{m,k}$  -The first day's comparable market return,
- $I_{m,1}$  - The market index value at the close of the first trading; and,
- $I_{m,0}$  -The market index value on the offer day of the appropriate stock

In order to compute the market adjusted abnormal return (MAAR) for each IPO on the first day of trading, the researcher used the returns obtained in formulas (1) and (2) above as follows:

$$MAAR_{i,0} = 100 * [\{1+R_{i,1}\} / (1+R_{m,1})\} - 1] \text{-----}(3)$$

### 3.4 Data description:

Appendix 1 shows the number of Kenyan IPO's on all different segments of the NSE during the 1994 to 2007 period. The most apparent observation is that the number of IPO's varies substantially from year to year. Specifically, there were two IPO waves, one from 1996 to 1997 and another from 2006 to 2007. However, an interesting observation from appendix 1 is that there were no issuances from 2001 to 2006. This could be attributed to licensing of the investment banks by the CMA to oversee IPO issuance. The data will enable the researcher to examine whether the performance of the IPO's in the segments in which the firm is categorized affects their performance as well.

### 3.5 Data analysis

Data collected for all the 15 companies that were listed during the period 1994 to 2007 were analyzed. The data analyzed will show the computations of the first day returns, total returns on the index, weekly returns and market adjusted abnormal returns using formula 3.



## **CHAPTER FOUR DATA ANALYSIS AND INTERPRATATIONS**

### **4.1 Introduction**

The study sets out to test for the existence of IPO under pricing anomaly at the NSE. The chapter covers the data analysis and interpretation of the same. To obtain information on short-term performance of IPOs at the NSE, the study adopted an event study. The closing price on the first day of trading is used as the most appropriate place to start measurement of short-term performance of IPOs. Initial return is defined as the return from buying shares at the offering price and selling them at the closing price on the first day of trading.

In order to obtain weekly returns during the one month period, the closing weekly share price have been used for each IPO. The analysis of initial returns has used raw data.

### **4.2 Short-run performance of IPOs**

The first day market adjusted returns were computed for the 18 IPOs. As shown in table 1, the IPOs have an average return of 57.60211%, standard deviation of 23.40956 and median of 57.60211. HFCK Company showed the highest initial returns of 143.95561% and ARM Company showed the lowest return of -28.31449% as its first day posting price was Kshs 9.05 as compared to the offer price of Kshs 12.25. This shows that the best time for short-term investors to buy shares of a company at its initial public offer as the prices rise significantly during the first few days of trading.

The 18 IPOs show a first day return ranging from -0.30276 to a high of 1.40399. HFCK Company shows the highest first day total return of 1.22476 followed by Kengen Company. Only Athi River Mining Company reported a negative first day total return of -0.30276.

### **4.3 Other possible factors that may influence the performance of IPOs**

#### **4.3.1 Foreign versus Domestic Companies**

A multinational company is a company that operates in more than two countries. In the study, only two multinational companies issued IPOs during the period 1984 to 2007. They are Barclays Bank of Kenya and Standard Chartered Bank. Barclays Bank had an initial return of 42.48533% while standard Chartered recorded a return of 72.02545% (Appendix 6 schedule 1). Athir River mining recorded the lowest return on first day return, with a return of -28.31449%.

The two multinational companies have had good performance in terms of profitability, market capitalization and share price compared to the local companies. The results also on share price growth during the first 12 weeks after the issuance of the IPO show that Athi River Mining traded at Kshs 9.05 down from the initial offer price of Kshs 12.25. This means that the shares depreciated by 26.12% compared to the initial price. Barclays Bank and Standard Chartered Bank which are multinational banks did not trade at prices below tier initial offer prices. Whereas this is not conclusive evidence that multinational companies perform better than the local companies, it is true to say that multinational companies listed at the NSE have shown greater and steady growth of their share prices, profitability and a high level of professional management.

#### **4.3.2 A company's size**

The 18 IPOs under study were of various sizes before going public. The size could be rated in terms of annual turnover, number of employees, asset base, previous ownership and general perception. Investor's perspective assumes that the bigger the size of a company before going public, the greater the potential for growth, profitability and perhaps the level of dividend payment. This, however, may not always be the case. It is perhaps for these considerations that some companies such as Athi River Mining have continued to perform poorly in terms of their share prices, turnover, profitability and dividend payment while the big companies have continued to attract impressive interest in form of demand for their shares.

The first reported case of a collapsed IPO in the history of NSE was that of Anglo African Properly Holdings Ltd in October 2000 the company sought to go public to strengthen its financial position by retiring residual liabilities and raise additional equity working capital. The offer collapsed as very few investors subscribed to the shares. The resultant collapse of the IPO was perhaps caused by strict listing rules and procedures, absence of market makers, economic recessions, but probably by the profile of the company's owners, size of the company, and previous financial performance. This is indicative that investors consider several factors before buying IPOs.

#### **4.3.3 Private companies versus Government owned enterprises**

In the study only HFCK, Mumias, KenGen, ICDCI, Kenya Commercial Bank, Uchumi Supermarkets Ltd, Housing Finance of Kenya and Kenya Airways have or have had substantial government holding. Selling their shares to the public was part of the government's privatization



program. The most successful privatization of government enterprise was that of Kenya Airways with an over subscription of 194.5% raising a record of Kshs. 2.664 billion. High initial return on privatization IPOs may be a result of deliberately chosen behaviour by the government. Thus privatization of an IPO at significant under pricing seems to be an appropriate vehicle to accomplish various objectives of privatization. Thus share ownership distribution in a country may be an important factor explaining the performance of privatization IPOs.

However, there is usually a general feeling that the government owned enterprises are usually mismanaged through lack of good corporate governance, loss making and the reason why the government would want to privatize them. Kenya Airways is an example. Before it went public, Kenya Airways was a loss making company with lots of unserviceable liabilities. Upon going public, the most crucial thing was to engage a strategic partner, KLM Royal airlines. The company has since recorded very good profits over the years and declaring dividends during some years. However, the performance of its shares has remained low in terms of the share price, which has in most cases, averaged below the initial offer price of Kshs. 11.25. During the first thirty six months of trading, the share traded at a high of Kshs. 10.10 per share and a low of Kshs. 7.00 per share (a share price depreciation of about 38% relative to the offer price), though the share continued to experience a huge trading volume. In terms of share price, Kenya Airways has not recorded significant growth since going public. Even when other securities have tended to rise in share price, its share price has remained relatively low.

Apart from multinational companies, that is, Barclays Bank of Kenya and Standard Chartered Bank which are foreign owned, others are privately owned. Before going public, National Industrial Bank was owned by Barclays Bank of Kenya. Based on the first day returns it is apparent that both private companies and government-owned enterprises have shown high returns with the highest recorded by a private company, Standard Chartered Bank with a rate of 72%.

#### **4.4 Interpretations**

The result show that the first day market adjusted returns have an average return of 57.60211% with HFCK Company showing the highest initial returns of 143.95561% and ARM Company showed the lowest return of -28.31449%. This shows that the best time for short-term investors

to buy shares of a company at its initial public offer as the prices rise significantly during the first few days.

In addition, the type of a company whether a multinational or a domestic company also determines the medium term performance of a company. For instance, Barclays Bank of Kenya and Standard Chartered Bank. Barclays Bank had an initial return of 42.48533% while Standard Chartered recorded a return of 72.02545% (Appendix 6 schedule 1) compared to Athi River Mining which recorded the lowest return of first day return, of -28.31449%. The two multinational companies have had good performance in terms of profitability, market capitalization and share price compare to the local companies.

Finally, the size of the company also affects the medium term performance of an IPO since investor's perspective assumes that the bigger the size of a company before going public, the greater the potential for growth, profitability and perhaps the level of dividend payment and this could be the reason why Athi River Mining continued to perform poorly in terms of their share prices, turnover, profitability and dividend payment while the big companies have continued to attract impressive interest in form of demand for their shares.



## CHAPTER FIVE CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

In this study, the short run market performance of initial public offerings in Kenya was analyzed. The first day return of 18 IPOs from 1984 to 2001 obtaining a mean under pricing of 22.57% with a standard deviation of 24.09. This shows that IPOs are generally underpriced at the offer stage as their prices go up significantly on their first day of trading at the stock market.

The above findings are consistent with other studies carried out in other market across the world and further confirm that IPOs are indeed grossly under priced at the initial stage. A number of reasons have been put forward for the new issues under pricing phenomenon, each with different theories focusing on various aspects of the relations between investors, issuers and the under writers taking the firms public. Jumba (2002) she found out that the average daily return for a sample of nine IPOs (1992 to 2000) was .06% in the three years after going public. However, in the same study, a market model of the NSE index constituent companies produced a daily average return of 0.3% over the same period three year period. Her findings suggested that IPOs in Kenya are deliberately under priced in the pre-market leading to high initial returns in comparison to the market return or the same period.

One observation made from the 15 companies studied is that there is a general over subscription of IPOs in Kenya with Barclays Bank of Kenya reporting the highest subscription rate of 613% and Mumias sugar company with the lowest rate of 77%. It is therefore fair to say that nearly all the IPOs placed at Nairobi stock market have had very good response from investors. However, it is important for the investors to note that IPOs are generally timed to benefit the seller by aiming to extract the maximum value from the market. According to the winner's curse hypothesis on IPO under pricing, if some investors are more likely to attempt to buy shares when the issue is under priced, then the amount of excess demand will be higher when there is more under pricing. The signaling hypothesis on under pricing of IPOs indicates that under priced issues leave a good taste and investors, allowing the firms and insiders to sell future offerings at a higher price than would otherwise to the case. This reputation argument has been formalized in several signaling models. In these models, issuing firms have private information about whether they have high or low values. The study found out that in the medium-term the IPOs over

performed the growth in the index indicating that apart from the first day abnormal returns, IPOs generally may be very good investment in the medium-term.

## **5.2 Limitations of the study**

### **5.2.1 Slow trading activities at the NSE**

Since its inception in 1954, the NSE was witnessed significant growth in terms of annual turnover, capitalization, index level and number of listed companies. However, despite this remarkable growth, activities of NSE have been low as compared to other stock markets where similar research projects have been carried out.

An article in the business week, Daily Nation, Tuesday, 21 November 2000 summarizes the market as one starved of investment opportunities. The article points out that incremental public issue borne out of privatization as having been very scant. The article goes on to say that, while the market capitalization has risen over the years, there has not been similar upswing in the number of deals necessary to evolve a liquid market.

The laws at the NSE have been blamed on among others, strict listing rules and procedures, lack of an alternative investment markets segment absence of market makers and a depressed economy. Also, the cost of going public may be a hindrance for some companies to go public. It may be the reason why some companies in Kenya prefer cheap debt financing rather than going public. The low activity of the NSE may also be caused by lack of investment knowledge on the part of prospective investors. The effect of the small number of investors is exemplified by the low turnover and low activity on the market.

### **5.2.2 Incomplete computerized services**

While collecting data for this project at the NSE library, it was evident that share prices of listed companies and other important details prior to 1993 were not available. For companies listed between 1984 and 1993, the share prices were extracted from the Daily Nation and standard Group libraries on the daily NSE market reports. During the formative years of the NSE, most of its operations were not computerized making it very 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 this period as relevant information is not available. One limitation faced in data



collection was that the NSE operations for a long time were not computerized thus making it difficult to retrieve the necessary information.

### **5.2.3 Small sample size**

This project considered only 15 IPOs out of 54 companies listed at NSE. This translates to about 27.8%. A larger sample would have been ideal. As compared to other researchers in other countries this is a very small sample. It is evident that the Nairobi Stock Exchange is not as developed as those in Europe and the US. It was noted that the sample used in the study was relatively small compared to other studies carried out in other countries particularly in the developed world. This is because the Nairobi Stock Exchange is not as big as in other countries. By end of 2001, the NSE had 40 listed companies on the main investment market segment (MIMS) and 10 companies in the alternative investment market segment (AIMS). With 50 companies, NSE is indeed a small exchange market though it is the most developed within the East African region. A bigger sample would probably have given better results of the performance of IPOs in Kenya.

### **5.3 Recommended areas for further study**

The researcher recommends that a study be carried out for all the IPOs issued since the inception of the NSE in 1954 so as to provide more comprehensive evidence of the performance of IPOs listed at the Nairobi stock Exchange. This study covered only IPOs issued between June 1994 and July 2007.

It is further recommended that a study to determine other pre-IPO factors that determine the medium-term performance of IPOs such as the age of the firm, the reputation of the under writer, the firm's profitability, experience of the board of directors and level of corporate governance, and the state of the economy

Another area for further study is determining why there have been very few IPOs at the NSE after operating for nearly fifty years and how other successful private companies could be encouraged to float their equity to the public in future.



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Year	Number of IPOs	Total Value (\$)	Number of IPOs	Total Value (\$)
1980	103	1,100,000,000	103	1,100,000,000
1981	104	1,100,000,000	104	1,100,000,000
1982	105	1,100,000,000	105	1,100,000,000
1983	106	1,100,000,000	106	1,100,000,000
1984	107	1,100,000,000	107	1,100,000,000
1985	108	1,100,000,000	108	1,100,000,000
1986	109	1,100,000,000	109	1,100,000,000
1987	110	1,100,000,000	110	1,100,000,000
1988	111	1,100,000,000	111	1,100,000,000
1989	112	1,100,000,000	112	1,100,000,000
1990	113	1,100,000,000	113	1,100,000,000
1991	114	1,100,000,000	114	1,100,000,000
1992	115	1,100,000,000	115	1,100,000,000
1993	116	1,100,000,000	116	1,100,000,000
1994	117	1,100,000,000	117	1,100,000,000
1995	118	1,100,000,000	118	1,100,000,000
1996	119	1,100,000,000	119	1,100,000,000
1997	120	1,100,000,000	120	1,100,000,000
1998	121	1,100,000,000	121	1,100,000,000
1999	122	1,100,000,000	122	1,100,000,000
2000	123	1,100,000,000	123	1,100,000,000
2001	124	1,100,000,000	124	1,100,000,000
2002	125	1,100,000,000	125	1,100,000,000
2003	126	1,100,000,000	126	1,100,000,000
2004	127	1,100,000,000	127	1,100,000,000
2005	128	1,100,000,000	128	1,100,000,000
2006	129	1,100,000,000	129	1,100,000,000
2007	130	1,100,000,000	130	1,100,000,000
2008	131	1,100,000,000	131	1,100,000,000
2009	132	1,100,000,000	132	1,100,000,000
2010	133	1,100,000,000	133	1,100,000,000
2011	134	1,100,000,000	134	1,100,000,000
2012	135	1,100,000,000	135	1,100,000,000
2013	136	1,100,000,000	136	1,100,000,000
2014	137	1,100,000,000	137	1,100,000,000
2015	138	1,100,000,000	138	1,100,000,000
2016	139	1,100,000,000	139	1,100,000,000
2017	140	1,100,000,000	140	1,100,000,000
2018	141	1,100,000,000	141	1,100,000,000
2019	142	1,100,000,000	142	1,100,000,000
2020	143	1,100,000,000	143	1,100,000,000
2021	144	1,100,000,000	144	1,100,000,000
2022	145	1,100,000,000	145	1,100,000,000
2023	146	1,100,000,000	146	1,100,000,000
2024	147	1,100,000,000	147	1,100,000,000
2025	148	1,100,000,000	148	1,100,000,000
2026	149	1,100,000,000	149	1,100,000,000
2027	150	1,100,000,000	150	1,100,000,000
2028	151	1,100,000,000	151	1,100,000,000
2029	152	1,100,000,000	152	1,100,000,000
2030	153	1,100,000,000	153	1,100,000,000



## Appendices

### Appendix 1: Initial Public Offers, 1984 to July 2007

Year	Company	Subscription rate (%)	Amount raised (Kshs)	Shares Floated	First Listing Price	Issue Price
1984	Jubilee insurance	220	11,600,000	800,000	15.00	14.40
1986	Barclays Bank	613	80,000,000	5,000,000	23.00	16.00
1988	KCB	147	297,000,000	7,500,000	36.00	20.00
1988	Nation Printers	133	28,750,000	2,500,000	11.80	11.50
1989	SCB	233	30,450,000	21,000,000	27.00	14.50
1991	KFC	110	40,800,000	600,000,000	14.00	12.50
1992	UCHUMI	103.20	232,000,000	16,000,000	17.75	14.50
1992	CROWN BERGER	104	138,000,000	8,640,000	16.50	16.00
1992	HFCK	400	126,000,000	18,000,000	28.50	7.00
1993	E A OXYGEN	100	42,400,000	20,000,000	16.00	8.00
1993	CMC	100	20,000,000	800,000,000	27.00	9.00
1994	FIRESTONE	101	1,420,000,000	40,000,000	34.00	33.50
1994	NBK	300	400,000,000	40,000,000	30.00	10.00
1994	NIC	77	718,000,000	17,930,000	56.00	52.00
1995	REA VIPINGO	100	102,000,000	8,000,000	16.50	8.50
1996	KCB	147	297,000,000	10,000,000	36.00	12.50
1996	KQ	194.60	2,664,000,000	150,000,000	38.00	14.00
1996	NBK	275	600,000,000	13,500,000	35.50	13.00
1997	TPS	400	167,609,000	12,890,000	16.80	13.00
1997	ARM	250	281,750,000	23,000,000	19.05	12.25
1999	HFCK	< 100	1,650,000	15,000,000	11.00	8.00
2000	AFRICAN LAKES	150	378,000,000	25,000,000	15.00	10.00
2001	MUMIAS	60	1,125,000,000	300,000,000	11.25	6.25
2001	ICDCI	64	331,208,164	15,500,000	34.50	15.00
2006	KenGen	333	7,800,000,000	2,198,361,456	40.50	11.90
2006	Scan Group	100	721,000,000	450,000,000	16.00	9.00
2007	Access Kenya	363	800,000,00	2,900,000	16.50	10.00
2007	Eveready East Africa	105	556,800,000	63,000,000	19.50	9.50
2007	Kenya Re	334	432,000,000	240,000,000	18.50	9.50

Source: Nairobi Stock Exchange

**Appendix 2: Financial Performance****Capital strength**

	<b>Dec '06</b>	<b>Dec '05</b>
	KSHS. '000	KSHS. '000
a) Core capital	4,360,556	3,604,662
b) Minimum Statutory Capital	250,000	250,000
c) Excess/(Deficiency)	4,110,556	3,354,662
d) Supplementary capital	415,727	1,996,366
e) Total capital	4,776,283	5,601,028
f) Total risk weighted assets	32,798,837	31,701,746
g) Core capital/total deposit liabilities	9.0%	8.0%
h) Minimum Statutory Ratio	8.0%	8.0%
i) Excess/(Deficiency)	1.0%	0.0%
j) Core capital/total risk weighted assets	13.3%	11.0%
k) Minimum Statutory Ratio	8.0%	8.0%
l) Excess/(Deficiency)	5.3%	3.0%
m) Total capital/total risk weighted assets	14.6%	18.0%
n) Minimum Statutory Ratio	12.0%	12.0%
o) Excess/(Deficiency)	2.6%	6.0%
<b>Liquidity</b>		
a) Liquidity Ratio	41.4%	35.7%
b) Minimum Statutory Ratio	20.0%	20.0%
c) Excess/(Deficiency)	21.4%	15.7%

**Appendix 3: Summary of Key Market Indicators**  
**Equities Market 31<sup>st</sup> July 2007 and 31<sup>st</sup> August 2007**

Equities market	31 <sup>st</sup> July 2007	31 <sup>st</sup> Aug 2007	Change	%Change
A) NSE Index (at end month)	5,340.08	5,372	31.64	0.59
B) Market Cap (Kshs bn)	781.03	811.23	30.20	3.55
C) No. of shares traded (Mn)	168.56	248.14	79.58	47.21
D) No. of issued shares (bn)	12.60	13.21	0.61	4.84
E) Turnover (Kshs bn)	6.44	9.25	2.81	43.63
F) No. of Transactions	74,162	96,045	21,883	29.51
<b>Fixed Income Securities Market</b>				
Total Bond Turnover (Kshs bn)	8.24	10.83	2.59	31.43
Number of Trading Days	22	23		

Source: NSE Monthly bulletin August 2007

## **Appendix 4: Companies Listed at the NSE**

### **Main Investments Market Segment (Mims)**

#### **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. Nation Media Group Ltd.
8. TPS (Serena) Ltd.
9. ScanGroup Ltd.
10. Standard Group Ltd.

#### **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. Kenya Re



**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 Investments Markets Segment (AIMS)**

1. A. Baumann and Company Ltd.
2. Citytrust Ltd.
3. Eaagads Ltd
4. Express Kenya Ltd.
5. Kapchorua Tea Co. Ltd.
6. Kenya Orchards
7. Williamson Tea Kenya Ltd
8. Limuru Tea Co. Ltd.

**Appendix 5: Table 3: Country patterns in IPO methods**

	Book Building			Public Offer		Auction
	Used at least sometimes	Dominant or gaining popularity	Hybrid BB/PO used	Used in past	Used today (not incl. hybrids)	Used today
<b>Europe</b>						
Austria	yes	yes	yes	yes	?	
Czech Republic				yes	yes	?
Finland	yes	yes	yes	yes	yes	
France	yes	yes	yes	yes		occasionally
Germany	yes	yes	yes	yes		
Hungary	yes	yes	yes	yes	yes	
Ireland	yes		yes	yes	yes	
Italy	yes	yes	yes	yes		
Netherlands	yes	yes	yes	yes		
Norway	yes	yes	yes	yes		occasionally
Portugal	yes	yes	yes	yes	yes	
Spain	yes	yes	yes			
Sweden	yes	yes	yes	yes	yes	
Switzerland	yes	yes	yes	yes		
United Kingdom	yes	yes	yes	yes	yes	
<b>N. &amp; S. America</b>						
Argentina	yes	yes	yes			
Barbados				yes	yes	
Brazil	yes	yes	?	yes	yes	
Canada	yes	yes	yes			
Chile	yes	yes				hybrid
Mexico	yes			yes	?	
Paraguay				yes	yes	
Peru	yes	yes	yes	yes	yes	occasionally
United States	yes	yes	yes			occasionally
<b>Asia/Pacific</b>						
Australia	yes	yes	yes	yes		
Bangladesh				yes	yes	
China	yes	yes	yes	yes	yes	
Hong Kong	yes	yes	yes	yes	yes	
India	yes		yes	yes	yes	
Indonesia				yes	yes	
Japan	yes	yes	yes			
Korea	yes	yes	yes	yes		
Malaysia				yes	yes	
New Zealand	yes	yes	yes	yes	yes	
Philippines		yes	yes	yes	?	
Singapore	yes		yes	yes	yes	
Sri Lanka				yes	yes	
Taiwan				yes	yes	yes
Thailand				yes	yes	
<b>Africa/Middle East</b>						
Kenya				yes	yes	
Israel				yes	yes	yes
Jordan				yes	yes	
South Africa	yes		yes	yes		
Turkey				yes	yes	

Source: Global Trends in IPO Methods: Book Building vs. Auctions: Ann E. Sherman Department of Finance and Business Economics University of Notre Dame 259 Mendoza College of Business Notre Dame March, 2002

## Appendix 6: International Evidence of Underpricing of IPOs

Country/Source	Sample size	Time period	Average Initial Return (%)
Australia (Lee, Taylor & Walter)	381	1976-1995	12.1
Austria (Aussenegg)	76	1984-1999	6.5
Belgium (Rogiers, Manigart)	86	1984-1999	14.6
Brazil (Aggarwal, Leal etc)	62	1979-1990	78.5
Canada (Jog and Riding)	500	1971-1999	6.3
Chile (Aggarwal, Leal)	55	1982-1987	8.8
China (Dattar and Mao)	432	1990-2000	256.9
Denmark (Jakobsen and Sorensen)	117	1984-1998	5.4
Finland (Keloharju)	99	1984-1997	10.1
France (Husson & Jacquillant)	571	1983-2000	11.6
Germany (Ljungqvist)	407	1978-1999	27.7
Greece (Kazantzis & Thomas)	129	1987-1994	51.7
Hong Kong (Markquiness)	334	1980-1996	15.9
India (Krishnamurti)	98	1992-1993	35.3
Indonesia (Hanafi)	106	1989-1994	15.1
Israel (Kandel, Sarig)	285	1990-1994	12.1
Italy (Arosio, Giudici)	164	1985-2000	23.9
Japan (Fukuda)	1689	1970-2001	28.4
Korea (Dhatt, Kim)	477	1980-1996	74.3
Malaysia (Isa and Yong)	401	1980-1998	104.1
Mexico (Aggarwal, Leal)	37	1987-1990	33.0
Netherlands (Wessels)	143	1982-1999	10.2
New Zealand (Vos & Cheung)	201	1979-1999	23.0
Nigeria (Ikoku)	63	1989-1963	19.1
Norway (Emilsen etc)	68	1984-1996	12.5
Philippines (Sullivan & Unite)	104	1987-1997	22.7
Poland (Aussenegg)	149	1991-1998	35.6
Portugal (Almeida & Duque)	21	1992-1998	10.6
Singapore (Lee, Taylor & Walter)	128	1973-1992	31.4
South Africa (Page & Reyneke)	118	1980-1991	32.7
Spain (Ansotegui & Fabregat)	99	1986-1998	10.7
Sweden (Rydqvist)	251	1980-1994	34.1
Switzerland (Kunz & Aggarwal)	42	1983-1989	35.8
Taiwan (Lin & Sheu)	293	1986-1998	31.1
Thailand (Wethyavivorn etc)	292	1987-1997	46.7
Turkey (Kiyamaz)	138	1990-1996	13.6
United Kingdom (Dimson, Levis)	3122	1959-2001	17.4
United States (Ibboston, S. & Ritter)	14840	1960-2001	18.4

Source: Loughran T., Ritter, J.R., and Rydqvist, *Pacific-Basin Finance Journal*, June 1994 (Updated September 5, 2002), 165-169.

**Appendix 7: Data Analysis Results: Summary of Abnormal Market Stock Returns**

YEAR	IPO	offer price	1st post listing price	Total Return for stock i	NSE Index on offer day	NSE Index on 1st day		formula 1 1st Day Total Return	formula 2 1st Return on market index		Formula 3 Market Adjusted Abnormal Return
1984	JUBILEE INSURANCE	14.40	15.00	0.04	385.51	385.56	0.00	0.04082	0.00013	0.04069	4.06870
1986	BARCLAYS BANK	16.00	23.00	0.36	470.09	450.09	-0.04	0.36291	-0.04348	0.42485	42.48533
1988	KCB	20.00	36.00	0.59	829.08	847.46	0.02	0.58779	0.02193	0.55372	55.37183
1988	NATION PRINTERS	11.50	11.80	0.03	855.68	853.66	0.00	0.02575	-0.00236	0.02818	2.81826
1989	SCB	14.50	27.00	0.62	871.12	822.61	-0.06	0.62169	-0.05730	0.72025	72.02545
1991	KFC	12.50	14.00	0.11	1260.00	820.00	-0.43	0.11333	-0.42956	0.95171	95.17107
1992	UCHUMI	14.50	17.75	0.20	1265.95	1175.77	-0.07	0.20224	-0.07390	0.29817	29.81712
1992	CROWN BERGER	16.00	16.50	0.03	1240.35	1152.99	-0.07	0.03077	-0.07304	0.11199	11.19856
1992	HFCK	7.00	10.50	0.41	1231.38	1213.56	-0.01	0.40547	-0.01458	0.42626	42.62561
1993	E A OXYGEN	8.00	16.00	0.69	1400.00	1213.00	-0.14	0.69315	-0.14338	0.97653	97.65339
1993	CMC	9.00	27.00	1.10	3800.00	3500.00	-0.08	1.09861	-0.08224	1.28666	128.66631
1994	FIRESTONE	33.50	34.00	0.01	4023.00	3499.00	-0.14	0.01482	-0.13955	0.17940	17.94013
1994	NBK	10.00	30.00	1.10	4015.00	3700.00	-0.08	1.09861	-0.08170	1.28533	128.53345
1994	NIC	52.00	56.00	0.07	4012.25	3854.11	-0.04	0.07411	-0.04021	0.11911	11.91097
1995	REA VIPINGO	10.50	12.00	0.13	3180.99	3075.67	-0.03	0.13353	-0.03367	0.17303	17.30269
1996	KQ	11.25	12.55	0.11	3075.24	2907.12	-0.06	0.10935	-0.05622	0.17544	17.54356
1996	NBK	13.00	35.50	1.00	3241.00	3254.00	0.00	1.00458	0.00400	0.99659	99.65908
1997	TPS	13.00	16.80	0.26	3288.00	3288.00	0.00	0.25643	0.00000	0.25643	25.64295
1997	ARM	12.25	9.05	-0.30	3377.87	3286.69	-0.03	-0.30276	-0.02736	-0.28314	-28.31449
1999	HFCK	8.00	11.00	0.32	1231.38	1213.56	-0.01	0.31845	-0.01458	0.33796	33.79575

2000	AFRICAN LAKES	10.00	15.00	0.41	2352.40	2341.12	0.00	0.40547	-0.00481	0.41225	41.22533
2001	MUMIAS	6.25	11.25	0.59	1621.68	1607.68	-0.01	0.58779	-0.00867	0.60167	60.16740
2001	ICDCI	15.00	34.50	0.83	1657.00	1612.00	-0.03	0.83291	-0.02753	0.88480	88.48036
2006	KENGEN	11.90	40.50	1.22	4196.48	4167.40	-0.01	1.22476	-0.00695	1.24034	124.03423
2006	SCAN GROUP	9.00	16.00	0.58	4220.52	4451.41	0.05	0.57536	0.05326	0.49570	49.56994
2007	ACCESS KENYA	10.00	16.50	0.50	5895.18	5766.44	-0.02	0.50078	-0.02208	0.53466	53.46608
2007	EVEREADY EAST AFRICA	9.50	19.50	0.72	4481.70	4588.94	0.02	0.71912	0.02365	0.67941	67.94103
2007	KENYA RE	9.50	18.50	0.67	4900.00	4612.00	-0.06	0.66648	-0.06057	0.77393	77.39324
	<b>Mean</b>	<b>13.86</b>	<b>21.54</b>	<b>0.44</b>	<b>2584.96</b>	<b>2487.85</b>	<b>-0.04</b>	<b>0.44</b>	<b>-0.05</b>	<b>0.49849</b>	<b>49.84921</b>
	<b>Standard Deviation</b>	<b>9.08</b>	<b>11.34</b>	<b>0.22</b>	<b>1557.51</b>	<b>1534.17</b>	<b>-0.02</b>	<b>0.39</b>	<b>0.09</b>	<b>0.24111</b>	<b>24.11120</b>
	<b>Median</b>	<b>11.70</b>	<b>16.65</b>	<b>0.41</b>	<b>2713.82</b>	<b>2624.12</b>	<b>-0.03</b>	<b>0.41</b>	<b>-0.03</b>	<b>0.46</b>	<b>46.10</b>

#### SCHEDULE 1: FIRESTONE

Time	end of week price	$pi,t-1$	$pi,t-1/pi,t-1$	$Ri,1=\ln(pi,t-1/pi,t-1)$	NSE index						
1	40.25				3483.54						
2	37.00	40.25	0.91925	0.00000	4559.40	3483.54	1.3088	0.3088	-0.3088		
3	33.00	37.00	0.89189	-0.11441	3939.68	4559.40	0.8641	-0.1359	0.0215		
4	28.00	33.00	0.84848	-0.16430	3897.42	3939.68	0.9893	-0.0107	-0.1536		
5	28.25	28.00	1.00893	0.00889	3639.86	3897.42	0.9339	-0.0661	0.0750		
6	25.00	28.25	0.88496	-0.12222	3519.44	3639.86	0.9669	-0.0331	-0.0891		
7	26.00	25.00	1.04000	0.03922	3405.49	3519.44	0.9676	-0.0324	0.0716		
8	22.25	26.00	0.85577	-0.15575	3464.23	3405.49	1.0172	0.0172	-0.1730		
9	24.00	22.25	1.07865	0.07571	3326.11	3464.23	0.9601	-0.0399	0.1156		
10	24.25	24.00	1.01042	0.01036	3114.60	3326.11	0.9364	-0.0636	0.0740		
11	24.00	24.25	0.98969	-0.01036	2845.43	3114.60	0.9136	-0.0864	0.0761		
12	23.75	24.00	0.98958	-0.01047	3307.68	2845.43	1.1625	0.1625	-0.1729		



**SCHEDULE 2: NATIONAL BANK OF KENYA**

Time	end of week price	pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index					
1	10.00				3118.78					
2	30.00	10.00	3.00000	0.00000	3128.01	3118.78	1.0030	0.0030	-0.0030	
3	31.00	30.00	1.03333	0.03279	3148.45	3128.01	1.0065	0.0065	0.0263	
4	32.00	31.00	1.03226	0.03175	3188.54	3148.45	1.0127	0.0127	0.0190	
5	34.00	32.00	1.06250	0.06062	3221.56	3188.54	1.0104	0.0104	0.0503	
6	35.00	34.00	1.02941	0.02899	3273.16	3221.56	1.0160	0.0160	0.0130	
7	33.00	35.00	0.94286	-0.05884	3301.67	3273.16	1.0087	0.0087	-0.0675	
8	34.00	33.00	1.03030	0.02985	3307.07	3301.67	1.0016	0.0016	0.0282	
9	35.00	34.00	1.02941	0.02899	3353.26	3307.07	1.0140	0.0140	0.0150	
10	36.00	35.00	1.02857	0.02817	3344.21	3353.26	0.9973	-0.0027	0.0309	
11	34.00	36.00	0.94444	-0.05716	3335.18	3344.21	0.9973	-0.0027	-0.0545	
12	33.00	34.00	0.97059	-0.02985	3341.56	3335.18	1.0019	0.0019	-0.0318	

**SCHEDULE 3: NIC**

Time	end of week price	pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index					
1	52.00				3585.56					
2	45.50	52.00	0.87500	0.00000	3483.54	3585.56	0.9715	-0.0285	0.0285	
3	55.50	45.50	1.21978	0.19867	4559.40	3483.54	1.3088	0.3088	-0.1102	
4	50.50	55.50	0.90991	-0.09441	3939.68	4559.40	0.8641	-0.1359	0.0415	
5	48.50	50.50	0.96040	-0.04041	3897.42	3939.68	0.9893	-0.0107	-0.0297	
6	42.75	48.50	0.88144	-0.12619	3639.86	3897.42	0.9339	-0.0661	-0.0601	
7	42.00	42.75	0.98246	-0.01770	3519.44	3639.86	0.9669	-0.0331	0.0154	
8	41.00	42.00	0.97619	-0.02410	3405.49	3519.44	0.9676	-0.0324	0.0083	
9	43.00	41.00	1.04878	0.04763	3464.23	3405.49	1.0172	0.0172	0.0304	
10	42.25	43.00	0.98256	-0.01760	3326.11	3464.23	0.9601	-0.0399	0.0223	
11	42.00	42.25	0.99408	-0.00593	3114.60	3326.11	0.9364	-0.0636	0.0577	
12	42.25	42.00	1.00595	0.00593	2845.43	3114.60	0.9136	-0.0864	0.0924	

**SCHEDULE 4: REA VIPINGO**

Time	end of week price	$pi,t-1$	$pi,t-1/pi,t-1$	$Ri,1=\ln(pi,t-1/pi,t-1)$	NSE index					
1	11.00				3019.20					
2	11.30	11.00	1.02727	0.00000	3031.02	3019.20	1.0039	0.0039	-0.0039	
3	11.45	11.30	1.01327	0.01319	3144.33	3031.02	1.0374	0.0374	-0.0242	
4	11.50	11.45	1.00437	0.00436	3150.08	3144.33	1.0018	0.0018	0.0025	
5	11.20	11.50	0.97391	-0.02643	3073.88	3150.08	0.9758	-0.0242	-0.0022	
6	10.80	11.20	0.96429	-0.03637	3089.83	3073.88	1.0052	0.0052	-0.0416	
7	10.10	10.80	0.93519	-0.06701	3055.97	3089.83	0.9890	-0.0110	-0.0561	
8	10.50	10.10	1.03960	0.03884	3042.06	3055.97	0.9954	-0.0046	0.0434	
9	10.00	10.50	0.95238	-0.04879	3114.11	3042.06	1.0237	0.0237	-0.0725	
10	11.00	10.00	1.10000	0.09531	3476.67	3114.11	1.1164	0.1164	-0.0211	
11	10.50	11.00	0.95455	-0.04652	3473.99	3476.67	0.9992	-0.0008	-0.0457	
12	9.00	10.50	0.85714	-0.15415	3354.72	3473.99	0.9657	-0.0343	-0.1198	

**SCHEDULE 5: KENYA AIRWAYS**

Time	end of week price	$pi,t-1$	$pi,t-1/pi,t-1$	$Ri,1=\ln(pi,t-1/pi,t-1)$	NSE index					
1	7.05				3144.33					
2	9.75	7.05	1.38298	0.00000	3150.00	3144.33	1.0018	0.0018	-0.0018	
3	10.10	9.75	1.03590	0.03527	3073.88	3150.00	0.9758	-0.0242	0.0594	
4	9.35	10.10	0.92574	-0.07716	3089.83	3073.88	1.0052	0.0052	-0.0823	
5	8.90	9.35	0.95187	-0.04933	3055.97	3089.83	0.9890	-0.0110	-0.0384	
6	8.70	8.90	0.97753	-0.02273	3042.06	3055.97	0.9954	-0.0046	-0.0182	
7	8.50	8.70	0.97701	-0.02326	3114.11	3042.06	1.0237	0.0237	-0.0469	
8	8.45	8.50	0.99412	-0.00590	3476.67	3114.11	1.1164	0.1164	-0.1223	
9	8.35	8.45	0.98817	-0.01190	3473.99	3476.67	0.9992	-0.0008	-0.0111	
10	8.35	8.35	1.00000	0.00000	3354.72	3473.99	0.9657	-0.0343	0.0343	
11	8.20	8.35	0.98204	-0.01813	3288.84	3354.72	0.9804	-0.0196	0.0015	
12	8.20	8.20	1.00000	0.00000	3460.55	3288.84	1.0522	0.0522	-0.0522	

**SCHEDULE 6: TPS SERENA**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index					
1	10.00					3118.78				
2	30.00	10.00	3.00000	0.00000	3128.01	3118.78	1.0030	0.0030	-0.0030	
3	31.00	30.00	1.03333	0.03279	3148.45	3128.01	1.0065	0.0065	0.0263	
4	32.00	31.00	1.03226	0.03175	3188.54	3148.45	1.0127	0.0127	0.0190	
5	34.00	32.00	1.06250	0.06062	3221.56	3188.54	1.0104	0.0104	0.0503	
6	35.00	34.00	1.02941	0.02899	3273.16	3221.56	1.0160	0.0160	0.0130	
7	33.00	35.00	0.94286	-0.05884	3301.67	3273.16	1.0087	0.0087	-0.0675	
8	34.00	33.00	1.03030	0.02985	3307.07	3301.67	1.0016	0.0016	0.0282	
9	35.00	34.00	1.02941	0.02899	3353.26	3307.07	1.0140	0.0140	0.0150	
10	36.00	35.00	1.02857	0.02817	3344.21	3353.26	0.9973	-0.0027	0.0309	
11	34.00	36.00	0.94444	-0.05716	3335.18	3344.21	0.9973	-0.0027	-0.0545	
12	33.00	34.00	0.97059	-0.02985	3341.56	3335.18	1.0019	0.0019	-0.0318	

**SCHEDULE 7: ATHI RIVER MINING**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index					
1	16.50					3460.55				
2	17.25	16.50	1.04545	0.00000	3530.43	3460.55	1.0202	0.0202	-0.0202	
3	17.50	17.25	1.01449	0.01439	3466.92	3530.43	0.9820	-0.0180	0.0324	
4	17.25	17.50	0.98571	-0.01439	3403.22	3466.92	0.9816	-0.0184	0.0040	
5	16.50	17.25	0.95652	-0.04445	3447.41	3403.22	1.0130	0.0130	-0.0574	
6	13.80	16.50	0.83636	-0.17869	3314.85	3447.41	0.9615	-0.0385	-0.1402	
7	14.00	13.80	1.01449	0.01439	3046.60	3314.85	0.9191	-0.0809	0.0953	
8	15.00	14.00	1.07143	0.06899	3415.14	3046.60	1.1210	0.1210	-0.0520	
9	16.00	15.00	1.06667	0.06454	3377.34	3415.14	0.9889	-0.0111	0.0756	
10	16.50	16.00	1.03125	0.03077	3562.23	3377.34	1.0547	0.0547	-0.0240	
11	13.60	16.50	0.82424	-0.19329	3213.30	3562.23	0.9020	-0.0980	-0.0953	
12	14.00	13.60	1.02941	0.02899	3015.01	3213.30	0.9383	-0.0617	0.0907	

**SCHEDULE 8: AFRICAN LAKES**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index				
1	12.00				4012.16				
2	12.00	12.00	1.00000	0.00000	3997.43	4012.16	0.9963	-0.0037	0.0037
3	17.50	12.00	1.45833	0.37729	3963.25	3997.43	0.9914	-0.0086	0.3858
4	15.55	17.50	0.88857	-0.11814	3919.17	3963.25	0.9889	-0.0111	-0.1070
5	15.55	15.55	1.00000	0.00000	3900.4	3919.17	0.9952	-0.0048	0.0048
6	15.55	15.55	1.00000	0.00000	3560.12	3900.4	0.9128	-0.0872	0.0872
7	15.55	15.55	1.00000	0.00000	3349.11	3560.12	0.9407	-0.0593	0.0593
8	15.55	15.55	1.00000	0.00000	3372.35	3349.11	1.0069	0.0069	-0.0069
9	15.55	15.55	1.00000	0.00000	3373.47	3372.35	1.0003	0.0003	-0.0003
10	15.55	15.55	1.00000	0.00000	3373.47	3373.47	1.0000	0.0000	0.0000
11	15.55	15.55	1.00000	0.00000	3362.23	3373.47	0.9967	-0.0033	0.0033
12	15.60	15.55	1.00322	0.00321	3329.23	3362.23	0.9902	-0.0098	0.0130

**SCHEDULE 9: MUMIAS SUGAR**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index				
1	12.00				2352.21				
2	12.00	12.00	1.00000	0.00000	2354.12	2352.21	1.0008	0.0008	-0.0008
3	17.50	12.00	1.45833	0.37729	2316.11	2354.12	0.9839	-0.0161	0.3934
4	15.55	17.50	0.88857	-0.11814	2308.29	2316.11	0.9966	-0.0034	-0.1148
5	15.55	15.55	1.00000	0.00000	2303.18	2308.29	0.9978	-0.0022	0.0022
6	15.55	15.55	1.00000	0.00000	2312.41	2303.18	1.0040	0.0040	-0.0040
7	15.55	15.55	1.00000	0.00000	2301.92	2312.41	0.9955	-0.0045	0.0045
8	15.55	15.55	1.00000	0.00000	2290.28	2301.92	0.9949	-0.0051	0.0051
9	15.55	15.55	1.00000	0.00000	2308.43	2290.28	1.0079	0.0079	-0.0079
10	15.55	15.55	1.00000	0.00000	2277.19	2308.43	0.9865	-0.0135	0.0135
11	15.55	15.55	1.00000	0.00000	2265.41	2277.19	0.9948	-0.0052	0.0052
12	15.60	15.55	1.00322	0.00321	2247.09	2265.41	0.9919	-0.0081	0.0113

**SCHEDULE 10: ICDCI**

Time	end of week price	pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index					
1	12.00				1621.68					
2	12.00	12.00	1.00000	0.00000	1607.68	1621.68	0.9914	-0.0086	0.0086	
3	17.50	12.00	1.45833	0.37729	1588.01	1607.68	0.9878	-0.0122	0.3895	
4	15.55	17.50	0.88857	-0.11814	1564.04	1588.01	0.9849	-0.0151	-0.1030	
5	15.55	15.55	1.00000	0.00000	1536.29	1564.04	0.9823	-0.0177	0.0177	
6	15.55	15.55	1.00000	0.00000	1519.21	1536.29	0.9889	-0.0111	0.0111	
7	15.55	15.55	1.00000	0.00000	1499.45	1519.21	0.9870	-0.0130	0.0130	
8	15.55	15.55	1.00000	0.00000	1457.39	1499.45	0.9719	-0.0281	0.0281	
9	15.55	15.55	1.00000	0.00000	1428.30	1457.39	0.9800	-0.0200	0.0200	
10	15.55	15.55	1.00000	0.00000	1427.62	1428.30	0.9995	-0.0005	0.0005	
11	15.55	15.55	1.00000	0.00000	1392.14	1427.62	0.9751	-0.0249	0.0249	
12	15.60	15.55	1.00322	0.00321	1386.40	1392.14	0.9959	-0.0041	0.0073	

**SCHEDULE 11: KEN GEN**

Time	end of week price	pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index					
1	49.50				4220.52					
2	47.00	49.50	0.94949	0.00000	4451.41	4220.52	1.0547	0.0547	-0.0547	
3	47.00	47.00	1.00000	0.00000	4383.83	4451.41	0.9848	-0.0152	0.0152	
4	49.00	47.00	1.04255	0.04167	4365.9	4383.83	0.9959	-0.0041	0.0458	
5	56.00	49.00	1.14286	0.13353	4280.96	4365.9	0.9805	-0.0195	0.1530	
6	45.00	56.00	0.80357	-0.21869	4216.79	4280.96	0.9850	-0.0150	-0.2037	
7	44.00	45.00	0.97778	-0.02247	4285.23	4216.79	1.0162	0.0162	-0.0387	
8	47.00	44.00	1.06818	0.06596	4218.1	4285.23	0.9843	-0.0157	0.0816	
9	40.00	47.00	0.85106	-0.16127	4263.59	4218.1	1.0108	0.0108	-0.1721	
10	43.00	40.00	1.07500	0.07232	4278.18	4263.59	1.0034	0.0034	0.0689	
11	42.00	43.00	0.97674	-0.02353	4246.44	4278.18	0.9926	-0.0074	-0.0161	
12	40.00	42.00	0.95238	-0.04879	4521.37	4246.44	1.0647	0.0647	-0.1135	



**SCHEDULE 13: SCAN GROUP**

Time	end of week price	Pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index						
1	11.50					4196.48					
2	44.00	11.50	3.82609	0.00000	4167.14	4196.48	0.9930	-0.0070	0.0070		
3	42.00	44.00	0.95455	-0.04652	4131.78	4167.14	0.9915	-0.0085	-0.0380		
4	43.00	42.00	1.02381	0.02353	4088.26	4131.78	0.9895	-0.0105	0.0341		
5	44.00	43.00	1.02326	0.02299	4069.29	4088.26	0.9954	-0.0046	0.0276		
6	39.00	44.00	0.88636	-0.12063	4045.13	4069.29	0.9941	-0.0059	-0.1147		
7	38.00	39.00	0.97436	-0.02598	3916.55	4045.13	0.9682	-0.0318	0.0058		
8	37.00	38.00	0.97368	-0.02667	3916.25	3916.55	0.9999	-0.0001	-0.0266		
9	37.00	37.00	1.00000	0.00000	4005.35	3916.25	1.0228	0.0228	-0.0228		
10	38.00	37.00	1.02703	0.02667	4115.90	4005.35	1.0276	0.0276	-0.0009		
11	36.00	38.00	0.94737	-0.05407	4056.65	4115.90	0.9856	-0.0144	-0.0397		
12	35.00	36.00	0.97222	-0.02817	3976.32	4056.65	0.9802	-0.0198	-0.0084		

**SCHEDULE 15: ACCESS KENYA**

Time	end of week price	pi,t-1	pi,t-1/pi,t-1	Ri,1=ln(pi,t-1/pi,t-1)	NSE index						
1	49.50					4220.52					
2	47.00	49.50	0.94949	0.00000	4451.41	4220.52	1.0547	0.0547	-0.0547		
3	47.00	47.00	1.00000	0.00000	4383.83	4451.41	0.9848	-0.0152	0.0152		
4	49.00	47.00	1.04255	0.04167	4365.9	4383.83	0.9959	-0.0041	0.0458		
5	56.00	49.00	1.14286	0.13353	4280.96	4365.9	0.9805	-0.0195	0.1530		
6	45.00	56.00	0.80357	-0.21869	4216.79	4280.96	0.9850	-0.0150	-0.2037		
7	44.00	45.00	0.97778	-0.02247	4285.23	4216.79	1.0162	0.0162	-0.0387		
8	47.00	44.00	1.06818	0.06596	4218.1	4285.23	0.9843	-0.0157	0.0816		
9	40.00	47.00	0.85106	-0.16127	4263.59	4218.1	1.0108	0.0108	-0.1721		
10	43.00	40.00	1.07500	0.07232	4278.18	4263.59	1.0034	0.0034	0.0689		
11	42.00	43.00	0.97674	-0.02353	4246.44	4278.18	0.9926	-0.0074	-0.0161		
12	40.00	42.00	0.95238	-0.04879	4521.37	4246.44	1.0647	0.0647	-0.1135		

**SCHEDULE 16: EVEREADY EAST AFRICAN**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index					
1	10.50				4481.70					
2	13.00	10.50	1.23810	0.00000	4585.94	4481.70	1.0233	0.0233	-0.0233	
3	12.00	13.00	0.92308	-0.08004	4839.24	4585.94	1.0552	0.0552	-0.1353	
4	13.00	12.00	1.08333	0.08004	4728.12	4839.24	0.9770	-0.0230	0.1030	
5	11.00	13.00	0.84615	-0.16705	4843.23	4728.12	1.0243	0.0243	-0.1914	
6	15.00	11.00	1.36364	0.31015	4889.68	4843.23	1.0096	0.0096	0.3006	
7	11.00	15.00	0.73333	-0.31015	4857.58	4889.68	0.9934	-0.0066	-0.3036	
8	10.00	11.00	0.90909	-0.09531	4910.60	4857.58	1.0109	0.0109	-0.1062	
9	9.00	10.00	0.90000	-0.10536	5177.90	4910.60	1.0544	0.0544	-0.1598	
10	12.00	9.00	1.33333	0.28768	5555.23	5177.90	1.0729	0.0729	0.2148	
11	13.00	12.00	1.08333	0.08004	5608.25	5555.23	1.0095	0.0095	0.0705	
12	14.00	13.00	1.07692	0.07411	5676.05	5608.25	1.0121	0.0121	0.0620	

**SCHEDULE 17: KENYA RE.**

Time	end of week price	$\pi_{i,t-1}$	$\pi_{i,t-1}/\pi_{i,t-1}$	$R_{i,1}=\ln(\pi_{i,t-1}/\pi_{i,t-1})$	NSE index					
1	10.50				4481.70					
2	12.00	10.50	1.14286	0.00000	4585.94	4481.70	1.0233	0.0233	-0.0233	
3	11.00	12.00	0.91667	-0.08701	4839.24	4585.94	1.0552	0.0552	-0.1422	
4	13.00	11.00	1.18182	0.16705	4728.12	4839.24	0.9770	-0.0230	0.1900	
5	14.00	13.00	1.07692	0.07411	4843.23	4728.12	1.0243	0.0243	0.0498	
6	12.00	14.00	0.85714	-0.15415	4889.68	4843.23	1.0096	0.0096	-0.1637	
7	11.00	12.00	0.91667	-0.08701	4857.58	4889.68	0.9934	-0.0066	-0.0804	
8	10.00	11.00	0.90909	-0.09531	4910.60	4857.58	1.0109	0.0109	-0.1062	
9	12.45	10.00	1.24500	0.21914	5177.90	4910.60	1.0544	0.0544	0.1647	
10	13.00	12.45	1.04418	0.04323	5555.23	5177.90	1.0729	0.0729	-0.0296	
11	15.00	13.00	1.15385	0.14310	5608.25	5555.23	1.0095	0.0095	0.1336	
12	16.00	15.00	1.06667	0.06454	5676.05	5608.25	1.0121	0.0121	0.0524	

**DESCRIPTIVE STATISTICS**

**Table 1: Summary of Descriptive Statistics for the Whole Market**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	275	22.5824	12.22614
NSE INDEX	275	2716.5898	1511.39870
Valid N (listwise)	275		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.156**
	Sig. (2-tailed)		.009
	N	275	275
NSE INDEX	Pearson Correlation	.156**	1
	Sig. (2-tailed)	.009	
	N	275	275

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.156 <sup>a</sup>	.024	.021	1495.56682	.024	6.832	1	273	.009

a. Predictors: (Constant), PRICE

**Table 2: Summary of Descriptive Statistics for Firestone**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	27.9792	5.77067
NSE INDEX	12	3541.9067	439.74751
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.627*
	Sig. (2-tailed)		.029
	N	12	12
NSE INDEX	Pearson Correlation	.627*	1
	Sig. (2-tailed)	.029	
	N	12	12

\*. Correlation is significant at the 0.05 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.627 <sup>a</sup>	.393	.332	359.45793	.393	6.463	1	10	.029

a. Predictors: (Constant), PRICE

**Table 3: Summary of Descriptive Statistics for National Bank of Kenya**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	31.4167	6.96039
NSE INDEX	12	3255.1208	89.60739
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.641*
	Sig. (2-tailed)		.025
	N	12	12
NSE INDEX	Pearson Correlation	.641*	1
	Sig. (2-tailed)	.025	
	N	12	12

\*. Correlation is significant at the 0.05 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.641 <sup>a</sup>	.410	.351	72.16351	.410	6.961	1	10	.025

a. Predictors: (Constant), PRICE



**Table 4: Summary of Descriptive Statistics for NIC**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	45.6042	4.82237
NSE INDEX	12	3565.0633	433.56506
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.807**
	Sig. (2-tailed)		.002
	N	12	12
NSE INDEX	Pearson Correlation	.807**	1
	Sig. (2-tailed)	.002	
	N	12	12

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.807 <sup>a</sup>	.651	.617	268.46345	.651	18.690	1	10	.002

a. Predictors: (Constant), PRICE

**Table 5: Summary of Descriptive Statistics for REA VIPINGO**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	10.6958	.72753
NSE INDEX	12	3168.8217	168.37040
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.274
	Sig. (2-tailed)		.388
	N	12	12
NSE INDEX	Pearson Correlation	-.274	1
	Sig. (2-tailed)	.388	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.274 <sup>a</sup>	.075	-.017	169.81361	.075	.814	1	10	.388

a. Predictors: (Constant), PRICE

**Table 6: Summary of Descriptive Statistics for Kenya Airways**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	8.6583	.80194
NSEINDEX	12	3227.0792	173.00661
Valid N (listwise)	12		

**Correlations**

		PRICE	NSEINDEX
PRICE	Pearson Correlation	1	-.394
	Sig. (2-tailed)		.205
	N	12	12
NSEINDEX	Pearson Correlation	-.394	1
	Sig. (2-tailed)	.205	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.394 <sup>a</sup>	.155	.070	166.79784	.155	1.834	1	10	.205

a. Predictors: (Constant), PRICE

**Table 7: Summary of Descriptive Statistics for ICDCI**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	42.6250	6.14272
NSE INDEX	12	3331.1950	40.26933
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.797**
	Sig. (2-tailed)		.002
	N	12	12
NSE INDEX	Pearson Correlation	.797**	1
	Sig. (2-tailed)	.002	
	N	12	12

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.797 <sup>a</sup>	.635	.599	25.50465	.635	17.422	1	10	.002

a. Predictors: (Constant), PRICE

**Table 8: Summary of Descriptive Statistics for TPS SERENA**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	15.6583	1.48704
NSE INDEX	12	3354.4167	177.03572
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.799**
	Sig. (2-tailed)		.002
	N	12	12
NSE INDEX	Pearson Correlation	.799**	1
	Sig. (2-tailed)	.002	
	N	12	12

\*\* . Correlation is significant at the 0.01 level (2-tailed).



**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.799 <sup>a</sup>	.638	.602	111.74585	.638	17.609	1	10	.002

a. Predictors: (Constant), PRICE

**Table 9: Summary of Descriptive Statistics for Athi River Mining**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	15.1250	1.56212
NSE INDEX	12	3626.0325	300.39334
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.396
	Sig. (2-tailed)		.202
	N	12	12
NSE INDEX	Pearson Correlation	-.396	1
	Sig. (2-tailed)	.202	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.396 <sup>a</sup>	.157	.073	289.23582	.157	1.865	1	10	.202

a. Predictors: (Constant), PRICE

**Table 10: Summary of Descriptive Statistics for African Lakes**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	15.1250	1.56212
NSE INDEX	12	2303.0533	31.21891
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.621*
	Sig. (2-tailed)		.031
	N	12	12
NSE INDEX	Pearson Correlation	-.621*	1
	Sig. (2-tailed)	.031	
	N	12	12

\*. Correlation is significant at the 0.05 level (2-tailed).

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.621 <sup>a</sup>	.386	.324	25.66415	.386	6.277	1	10	.031

a. Predictors: (Constant), PRICE

**Table 11: Summary of Descriptive Statistics for Mumias**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	15.1250	1.56212
NSE INDEX	12	1502.3508	83.44948
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.444
	Sig. (2-tailed)		.148
	N	12	12
NSE INDEX	Pearson Correlation	-.444	1
	Sig. (2-tailed)	.148	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.444 <sup>a</sup>	.197	.117	78.43376	.197	2.452	1	10	.148

a. Predictors: (Constant), PRICE

**Table 12: Summary of Descriptive Statistics for Scan Group**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	45.7917	4.52999
NSE INDEX	12	4311.0267	98.64566
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.164
	Sig. (2-tailed)		.610
	N	12	12
NSE INDEX	Pearson Correlation	-.164	1
	Sig. (2-tailed)	.610	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.164 <sup>a</sup>	.027	-.070	102.05563	.027	.277	1	10	.610

a. Predictors: (Constant), PRICE

**Table 13: Summary of Descriptive Statistics for Ken Gen**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	37.0417	8.63518
NSE INDEX	12	4057.0917	90.76926
Valid N (listwise)	12		



**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	-.241
	Sig. (2-tailed)		.450
	N	12	12
NSE INDEX	Pearson Correlation	-.241	1
	Sig. (2-tailed)	.450	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.241 <sup>a</sup>	.058	-.036	92.38258	.058	.619	1	10	.450

a. Predictors: (Constant), PRICE

**Table 14: Summary of Descriptive Statistics for ACCESS Kenya**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	11.9583	1.73805
NSE INDEX	12	5012.7933	401.11692
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.218
	Sig. (2-tailed)		.496
	N	12	12
NSE INDEX	Pearson Correlation	.218	1
	Sig. (2-tailed)	.496	
	N	12	12

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.218 <sup>a</sup>	.048	-.048	410.57932	.048	.499	1	10	.496

a. Predictors: (Constant), PRICE

**Table 15: Summary of Descriptive Statistics for Eveready East Africa**

**Descriptive Statistics**

	N	Mean	Std. Deviation
PRICE	12	12.4958	1.82164
NSE INDEX	12	5012.7933	401.11692
Valid N (listwise)	12		

**Correlations**

		PRICE	NSE INDEX
PRICE	Pearson Correlation	1	.717**
	Sig. (2-tailed)		.009
	N	12	12
NSE INDEX	Pearson Correlation	.717**	1
	Sig. (2-tailed)	.009	
	N	12	12

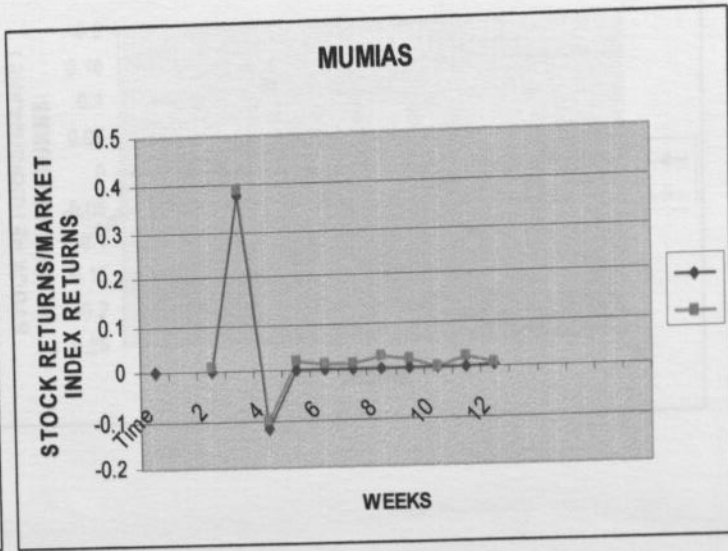
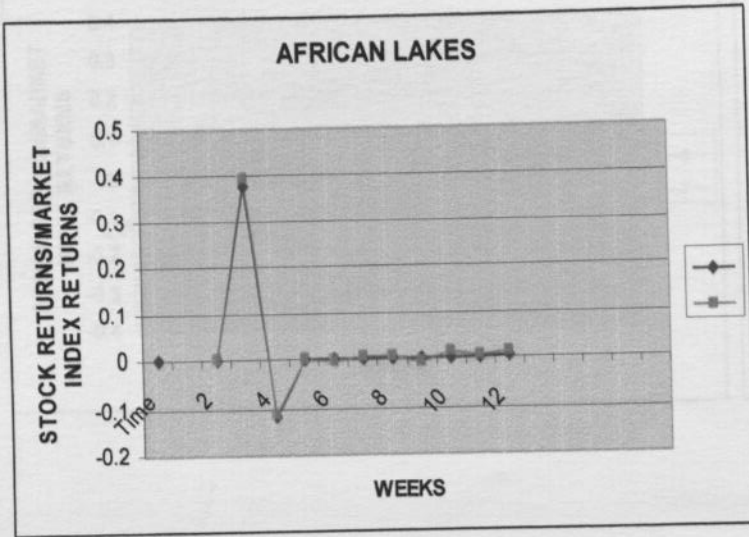
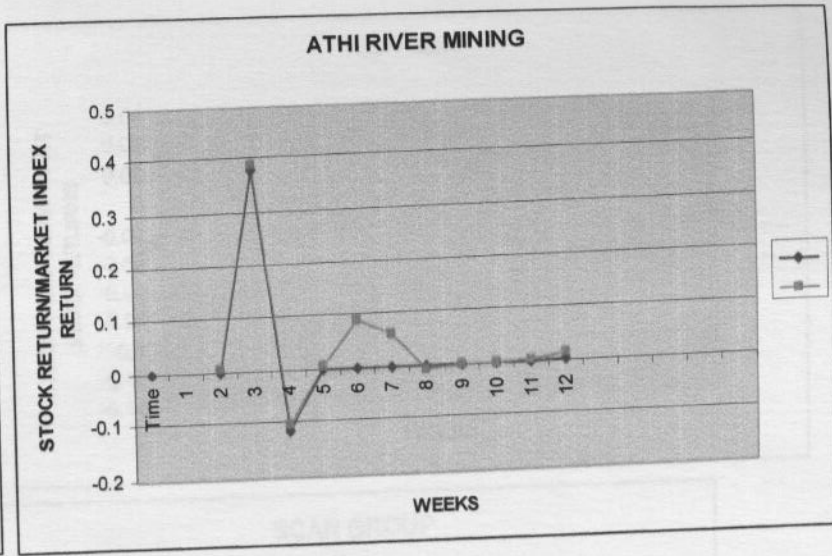
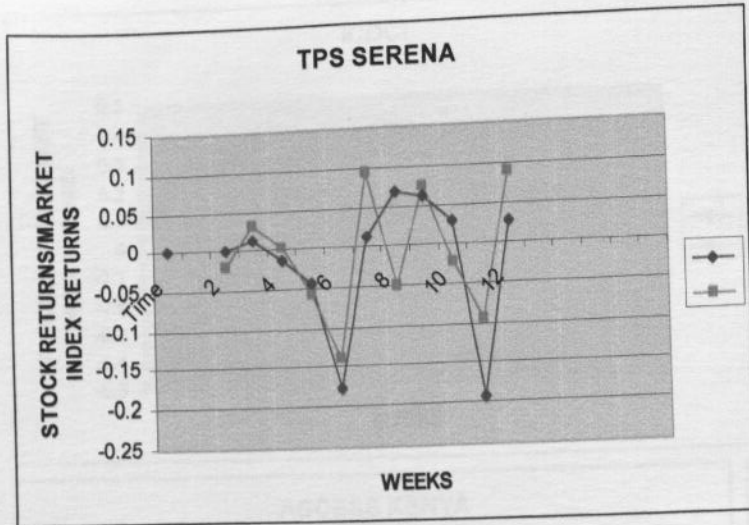
\*\* . Correlation is significant at the 0.01 level (2-tailed).

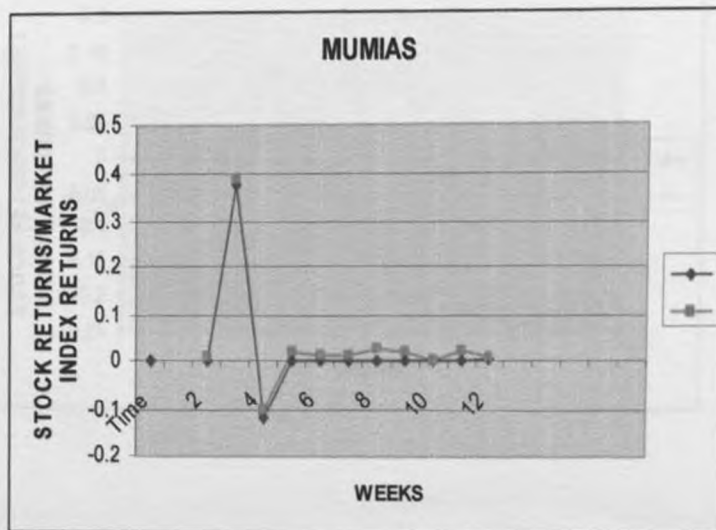
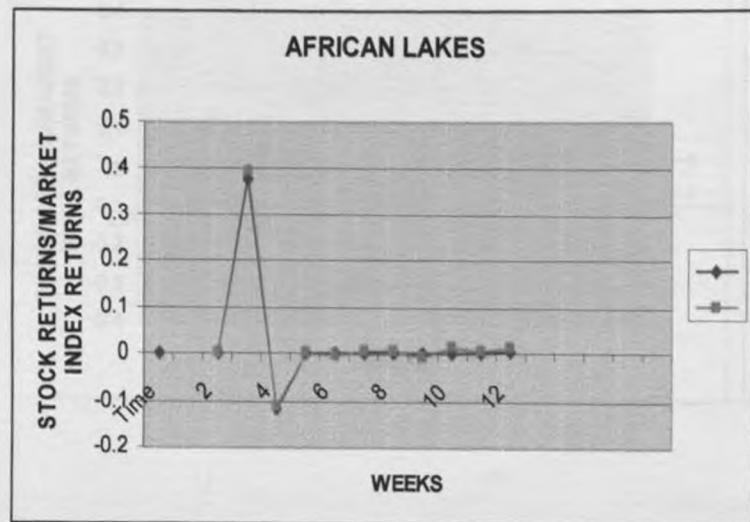
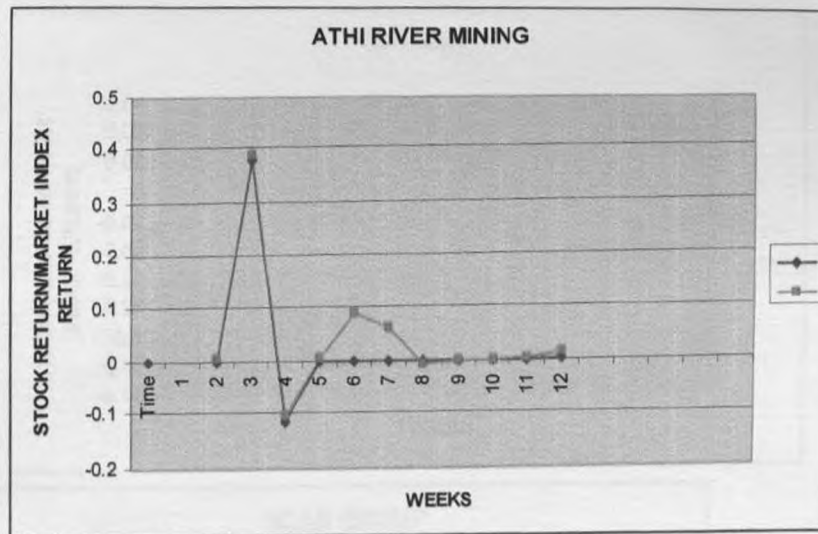
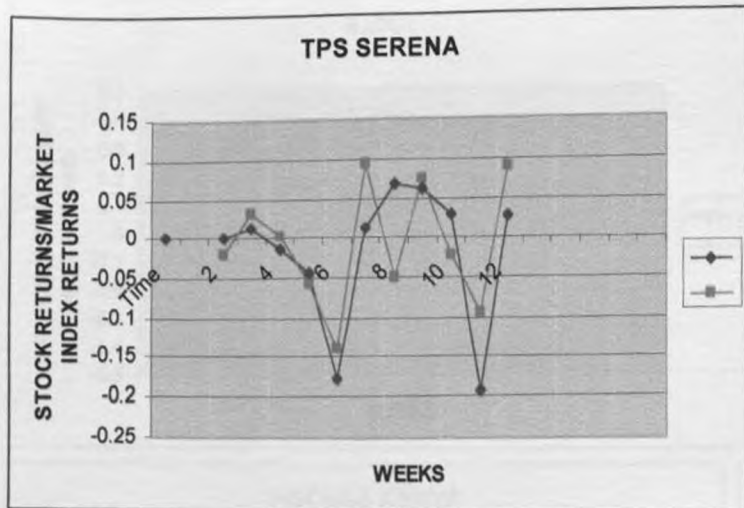
**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.717 <sup>a</sup>	.514	.465	293.30082	.514	10.573	1	10	.009

a. Predictors: (Constant), PRICE

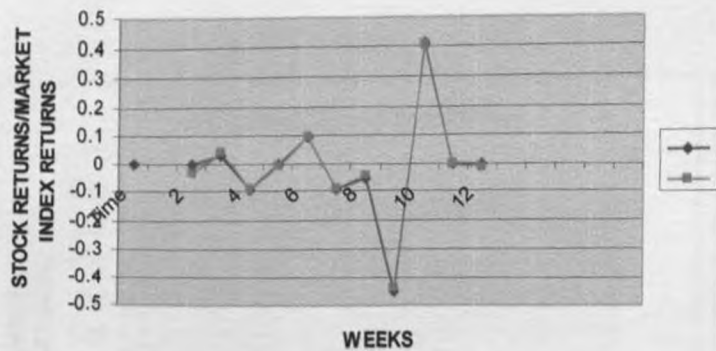
**Table 16: Summary of Descriptive Statistics for Kenya Re**



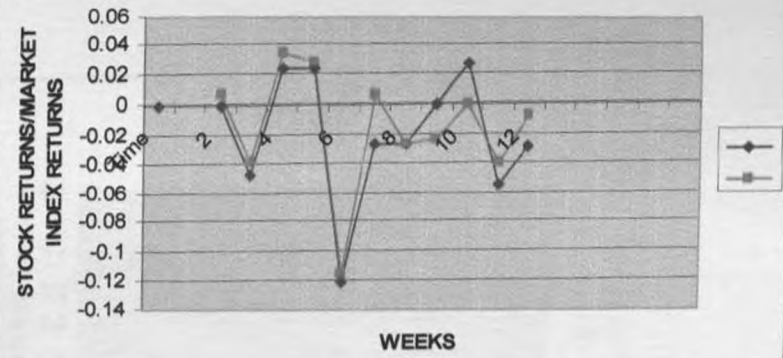




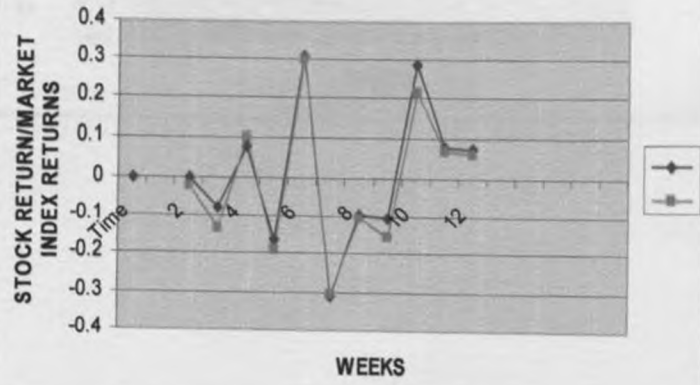
ICDCI



KENGEN



ACCESS KENYA



SCAN GROUP

