



Effects of IPO timing on the underpricing of shares of companies listed on the Nairobi Securities Exchange (NSE), Kenya

Mutai Joseph

Department of Management Science, School of Business and Economics,
Moi University P.O. BOX 3900-30100 Eldoret

Email: mutaij@gmail.com or taitamutai@gmail.com

ABSTRACT

One of the most intriguing aspects associated with (initial public offerings (IPOs) is the apparent abnormal increase in share price on the first day of trading. Although the phenomenon has been subject to a plethora of explanations, none of them has been sufficiently acceptable. Few studies have looked at the possible explanations for the short run underpricing of IPOs of listed companies in Kenya. The objective of this study was to investigate the effect of IPO timing on underpricing of shares of companies listed on the NSE. An explanatory survey design was adopted for the study, with IPO timing (the date of the IPO offer) as the explanatory variable while first-day return was the endogenous variable. The target population of the study was 12 companies that had sold shares to the public between January 1996 and December 2013 and 54 other companies on the Stock Exchange, which were used to compute benchmarks (NSE-20 share index), against which the companies that had issued IPOs in the study were compared. The entire population (census) of the companies was used in the study, as the target population was small. The study analysed company data (prospectuses and annual statements) and the stock share price on the first day of trading after IPO from the NSE. The study found an average underpricing of 55.36% and a median underpricing of 24.71%, with all companies except one, having had its offer price under-priced. Short run underpricing was always found, regardless of the type of industry, the nature of ownership of the firm, age of the company or the size of the IPO offer. However, the study found that the more an IPO was oversubscribed, the more the abnormal return that ensued ($r=0.59$, $p=0.046$). Regression analyses revealed that the prevailing market sentiment is a significant predictor of abnormal initial return, with more significant underpricing occurring during bull markets compared with bear markets ($\beta = .603$, $t=2.393$, $p=0.038$). The study thus found evidence for the importance of “investor sentiment” in explaining short run underpricing. The study recommends that investors should rationally analyse each company performance and history before investing in the IPO, rather than joining the ‘band wagon’ of investment as oversubscribed issues experience more significant underpricing.

Keywords: IPO timing, initial return, investor sentiment

INTRODUCTION

An initial public offering (IPO) or a stock market launch is a type of public offering where shares of stock in a company are sold to the public, on a securities exchange for the first time, transforming a hitherto private company into a public one. The primary objective for firms going public is to raise equity capital and to create a public market in which founders and other shareholders can convert some of their wealth into cash at a future date (Ritter and Welch, 2002). The move, however, is fraught with many pitfalls, requiring at least a year of effort, particularly on the part of a company's top management team to prepare and market the company. In addition, the firm undergoes numerous internal changes as it prepares to



become “professional” and acquires new obligations in the form of transparency and disclosure requirements. It also 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 (Loughran and Ritter, 2002; Welbourne and Andrews, 1996).

One of the most intriguing aspects associated with IPOs is the apparent abnormal increase in share price on the first day of trading. Stoll and Curley (1970), Logue (1973), Reilly (1973) and Ibbotson (1975) were the first researchers to document a seemingly anomalous increase from the offer price to the first day closing price. This phenomenon is also called first-day return (initial return), as it signifies the share price on the first day of trading, or underpricing, since if the first day trading price truly represents the company’s value as dictated by supply and demand, then the offer price was in reality below the actual value of the firm. Underpricing causes the issuing company (or major stockholders) to lose money, a phenomenon called “money left on the table”, which is counterintuitive as to why the company went public in the first place, which was to raise capital. The differences between the IPO offering price and the first day closing price have been found to occur too often and to be, on average, too large to be explained away by error in auditing practices. IPO, lampooned by Adams *et al.* (2008), as Instant Profit Opportunity, is also an enigma for the efficient market hypothesis, which envisages that security prices fully reflect all publicly and privately available information (Fama, 1998). Hence, issuers should generally receive market value for the shares issued while investors should not be able to purchase regularly IPOs at a discount to their market value.

Underpricing has been documented in many markets around the world. In a study of more than three thousand IPO issues on Wall Street between 1990 through 1998, Loughran and Ritter (2002) documented the average gain in the first day of trading to be 14.1%, although returns were found to vary somewhat with the performance of the market. During the internet boom in the U.S.A (1999 – 2000), underpricing averaged an enormous 63.5% with 803 companies leaving roughly \$65 billion on the table when they went public (Loughran and Ritter, 2004). Loughran *et al.* (1994) and Ritter (2003) reported that underpricing was a common phenomenon in several countries around the world, with abnormal returns ranging from 6% in Canada, 18% in UK, 31% in Taiwan, 33% in Mexico to 79% in Brazil. Underpricing has been reported, regardless of the industry (Ritter, 2003). Chambers and Dimson (2009) in a comprehensive study of British IPOs since World War I reported that public offers were underpriced by an average of 3.80% (between 1917 – 1945), 9.15% (between 1946 – 1986) and 19% (between 1986 – 2007). On the NSE, Tenai *et al.* (2011) found an average underpricing of 49.44% amongst Kenyan IPOs offered between 1994 and 2008. In this study, the authors found that investor sentiment, post-IPO ownership retention, firm size, board prestige and age of the firm had no significant influence on the IPO offer price.

A plethora of theories has been proposed since the early 1980s to account for IPO underpricing. Most of the earlier underpricing models were based on information asymmetries between owners, underwriters and outside investors while later theories, emerging in the late 1990s, make fewer assumptions about information distribution frictions and could be termed as information symmetry theories (Wan Hussin, 2005). The former includes adverse selection models, where uninformed investors are induced to participate in IPOs by lowering the offer price (Carter and Manaster, 1990), signalling model, in which



high-quality issuers ‘signal’ their quality by deliberately selling their shares at a lower price (Ritter & Welch, 2002), and the hazard model, where issuers compensate underwriters for their information (Eisenbeis and McEnally, 1995). Information symmetry theories include prospect theory (Loughran and Ritter, 2002), in which managers don’t care about losing the money during under-pricing, since their unsold stock will gain when the share price jumps on the first day while Hughes and Thakor (1992) argued that issuers underprice their shares to reduce their legal liability.

Beginning with Ritter and Welch (2002) and Ljungqvist (2004), many researchers felt that deficiencies in theories based on asymmetric information (hitherto the most plausible explanations for underpricing) could be explained by behavioural theories. The latter models assert, mostly, the presence of irrational (also called sentiment or noise) investors, who show irrational exuberance, over optimism, and over enthusiasm about investment opportunities without any relevant justification. Thus, at the heart of most behavioural theories is investor sentiment, defined by Baker and Wurgler (2007) as “a belief about future cash flows and investment risks that is not justified by the facts at hand”. Sentimental investors do not rationally assess a fundamental value of an investment but instead buy or sell assets depending on their emotions. The opposite of sentiment investors are rational investors or ‘arbitrageurs’, who are usually institutional or regular investors. Ljungqvist *et al.* (2006) were among the first researchers to argue that the presence of sentiment investors could explain underpricing and long-run underperformance. According to them, the sentiment investors’ behavior and stocks demand is transient and unpredictable. However, regular investors can hold IPO stock in inventory but this entails risk as sentiment demand could cease and the hot market end before offloading the entire inventory. Thus, the optimal solution involves the “issuer allocating stock to regular institutional investors for subsequent resale to sentiment investors, at prices the regulars maintain by restricting supply” (Ljungqvist *et al.*, 2006). Since sentiment demand might decline and the hot market cease, institutional investors are compensated for expected losses by receiving underpriced shares. Nevertheless, Ljungqvist *et al.* (2006) did not empirically test their postulations. Hrnjic and Sankaraguruswamy (2011) and Campbell *et al.* (2008), tested the effect of sentiment investors on IPO underpricing and found a significant relationship. Several studies conducted on Kenyan IPOs have presented solid evidence on underpricing and long-run underperformance (Tenai *et al.*, 2011 and Makokha, 2013). These studies did not plausibly explain the probable cause for underpricing experienced in the Kenyan IPO. The objective of this study was to investigate the effect of IPO timing on underpricing of shares of companies listed on the NSE.

METHODOLOGY

An explanatory survey design was adopted for the study, with IPO timing (the date of the IPO offer) as the explanatory variable while first-day return was the endogenous variable. The target population of the study was 12 companies that had sold shares to the public between January 1996 and December 2013 and 54 other companies on the Stock Exchange, which were used to compute benchmarks (NSE-20 share index), against which the companies that had issued IPOs in the study were compared. The complete enumeration was used in the study, as the target population was small. The study analysed company data (prospectuses and annual statements) and the stock share price on the first day of trading after IPO from the NSE. The 12 companies in the study were distributed, four each, in the



three major divisions of the NSE: industrial and allied, commercial and services, and finance and investment.

Most of the proxies that have been used to measure investor sentiment can be classified into two basic groups, explicit (direct) and implicit (indirect) measures. The former are based on surveys, in which investors are asked about the economic conditions prevailing at the time. The latter measures gauge investor sentiment, based on some kind of market statistics (Hrnjic and Sankaraguruswamy, 2011), for instance, aggregate trading volume, net fund flows, equity-to-debt ratio, IPO returns and IPO volumes. Because some of the IPOs had been issued in the distant past, obtaining reliable surveys might have been difficult. Consequently, this study adopted IPO volume as a proxy for investor sentiment. The variable consisted of either an IPO being issued in a “bull” market (hot market) or a bear market. The study considered IPOs issued between 2005 and May 2008 as being issued during a ‘bullish’ market. This was because this period witnessed intense IPO activity on the NSE and it was before the advent of the global financial crisis. For instance, the equities turnover in 2008 closed at Kshs 97.5 Billion; up 9% from Kshs 88.62 Billion in 2007, which was a 6% drop from Kshs 95 Billion in 2006. The number of equities transactions in 2008 closed at 890,542 deals, down 9% from 973,548 deals in 2007, a 63% jump from 598,301 deals in 2006. The collapse of Lehman Brothers in mid-September 2008 triggered a near complete freezing up of global credit markets. Upon Lehman’s collapse, investors around the world retreated from shares, mutual funds, and riskier assets in general. This triggered a dramatic pullback from the emerging markets by many hedge funds and asset managers (Oakley, 2008; CMA, 2008). Thus, the period between June 2008 and 2011, was considered as a ‘bearish’ market with many investors (both local and international retreating from the stock market (Oakley, 2008). In addition, the period between 1996 and 2000 was considered ‘bearish’ because of political upheavals (for instance, the ‘SabaSaba’ march on 7th of July 2007, just two days before the opening of the ARM IPO), the agitation for political freedom and the general poor economic performance (CMA, 2008). According to this classification, Table 1 provides the prevailing market sentiment at the time of issue of each IPO in the study.

Table 1: Market sentiment at time of IPO

Company	Year of IPO offer	Market sentiment at time of IPO
Safaricom	May, 2008	Bullish
Cooperative	December, 2008	Bearish
Britam	September, 2011	Bearish
Scangroup	August, 2006	Bullish
Access Kenya	June, 2007	Bullish
Eveready	December, 2006	Bullish
Kengen	May, 2006	Bullish
Kenya Reinsurance	August, 2007	Bullish
Mumias Sugar	December, 2006	Bullish
KCB	May, 1998	Bearish
Kenya Airways	June, 1996	Bearish
Athi River Mining	August, 1997	Bearish

Thus, seven (58%) of the companies issued their IPO when the prevailing market sentiment was “bullish” whereas five (42%) of the firms offered their IPOs when the market sentiment was “bearish”.



The initial return was defined as, the difference between the price on offering date and the closing price on the first publicly traded day and was calculated as in Equation 1 (Ritter (1991):

$$Rr_{i1} = \left[\left(\frac{P_{i1}}{P_{i0}} \right) - 1 \right] \times 100\% \quad (1)$$

Where, P_{i1} was the closing price of stock i on the first trading day, and P_{i0} was the prospectus price on the opening day.

The effect of industry type (whether industrial and allied, commercial and services, or finance and investment) on initial return was analysed using analysis of variance (ANOVA) and post-hoc analysis carried out by Tukey's Honestly Significant Difference (HSD) test. Independent Samples t-test was used to determine the relationship between abnormal return and whether the company was wholly owned by a private entity at the time of the IPO or was partly owned by the Government of Kenya (GoK). Pearson's correlation coefficients were computed to analyse the effects of the age of the company at IPO (in years), amount of funds raised at IPO (in millions of Kenya Shillings), and the percentage subscription of the shares offered.

To study the effect of IPO timing on initial return, the following general function (Equation 2) was utilised:

$$Y = f(X, \varepsilon) \quad (2)$$

Where Y was initial return, X was the market sentiment at the time of IPO (1 and 0 for bull and bear markets, respectively) and ε was error term, whose variance is normally and randomly distributed. Data was fitted to a linear function using ordinary least square techniques (OLS) as in Nimoh *et al.* (2012). The resultant linear regression equation was in the form implicitly represented by Equations 3.

$$Y = \alpha + bX + \varepsilon \quad (3)$$

Where α was the constant or intercept, b the coefficient for market sentiment while Y , ε , X were as defined in Equation 2. All statistical tests were two-tailed. Significant levels were measured at 95% confidence level with significant differences recorded at $p < 0.05$.

RESULTS

Initial Return performance

The study found an average underpricing of 55.36% (Table 2) and a median underpricing of 24.71%. All companies in the study, except Britam, experienced an underpricing on the first day of trading. The abnormal return ranged from -11.11% for Britam to a maximum of 236.13% for Kengen. The highest underpricing was found with Kengen (236.13%), followed by Scangroup (139.23%), Eveready (105.26%), Kenya Reinsurance (68.42%) and Safaricom (47%) while the the lowest underpricing was observed in IPOs of Britam (-11.11%), ARM (2.86%), Mumias Sugar (5.45%), Cooperative Bank (10%), KQ (11.56%), and KCB (15%).



Table 2: Initial return performance

Company	IPO year	Prospectus price (P ₀) Ksh.	First day trading closing price (P ₁) Ksh.	Initial stock return
Safaricom	2008	5.00	7.35	47.00
Cooperative Bank	2008	9.50	10.45	10.00
Britam/BA	2011	9.00	8.00	-11.11
Scangroup	2006	10.45	25.00	139.23
Access Kenya	2007	10.00	13.45	34.50
Eveready	2006	9.50	19.50	105.26
Kengen	2006	11.90	40.00	236.13
Kenya Reinsurance	2007	9.50	16.00	68.42
Mumias Sugar	2006	49.50	52.20	5.45
KCB (3 rd IPO)	1998	65.00	74.75	15.00
KQ	1996	11.25	12.55	11.56
ARM	1997	12.25	12.60	2.86
Mean		17.74	24.32	55.36
Standard deviation		18.84	20.89	72.71
Median		10.23	14.73	24.71
Range		5.00 – 65.00	7.35 – 74.75	-11.11 – 236.13
Skew		2.15	1.64	1.65

Key: BA=Britam, KCB = Kenya Commercial Bank, KQ= Kenya Airways, ARM=Athi River Mining Company

Four companies (33.3%) in the study were owned wholly by private entities at the time of offering IPO. On the other hand, eight companies (66.7%) were partly owned by the Government of Kenya (GoK), which offloaded a proportion of the shares. The oldest company (from incorporation to the date of IPO offer) was found to be KCB (102 years old), followed by BA (46 years), Cooperative Bank (43 years) and Eveready (39 years) (Figure 1). The youngest was found to be Kengen (eight years), Scangroup and Safaricom (both ten years) and Access Kenya (12 years).

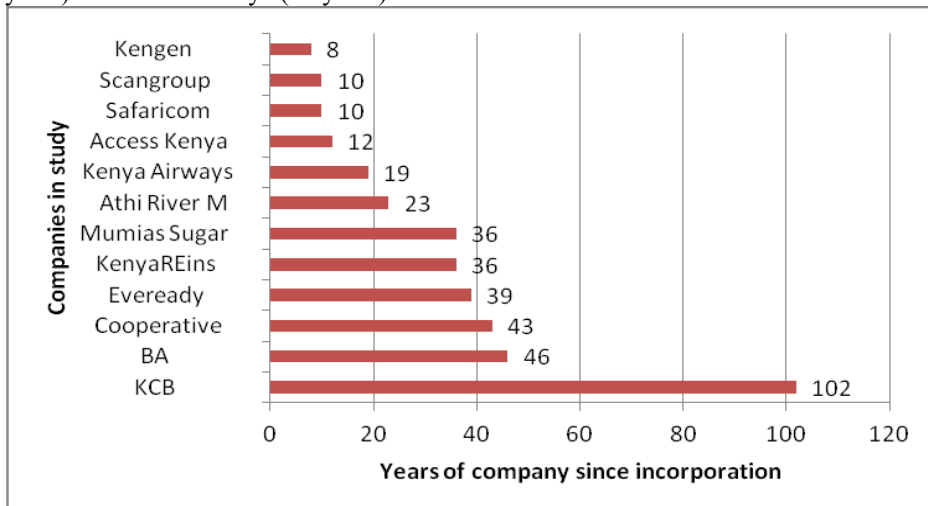


Figure 1: Company age from incorporation to IPO



With respect to amount of funds raised during an IPO, Safaricom (Figure 2) was found to have raised the highest amount (40 billion shillings), followed by Kengen (8 billion shillings), and cooperative bank (5 billion shillings). The smallest issues were found to be ARM (281 million Kshs), Eveready (599 million Kshs) and Scangroup (721 million Kshs).

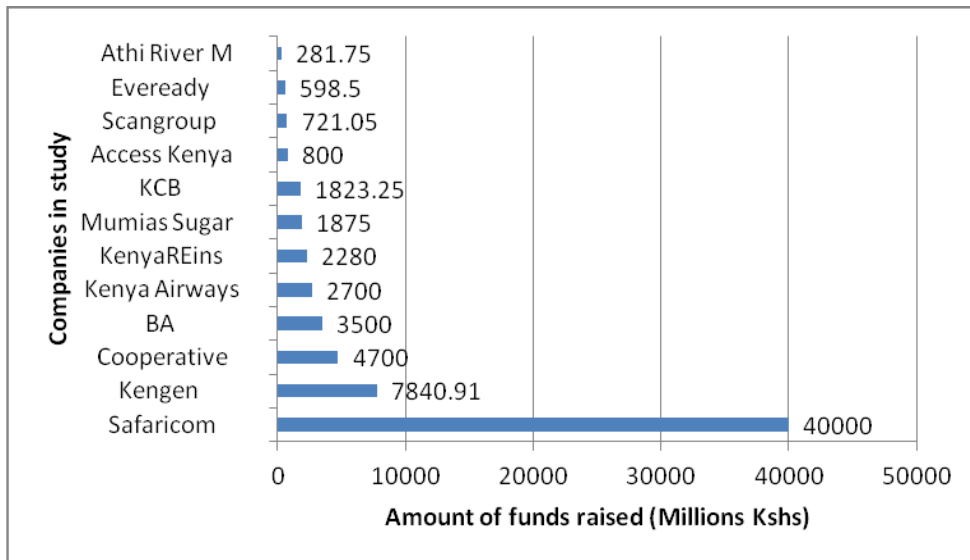


Figure 2: Size of firms as measured by amount of funds raised

All IPOs in the study were oversubscribed, with percentage oversubscription ranging from 60% for Mumias Sugar to 830% for Eveready (Figure 3). The most oversubscribed IPO was found to be Eveready (at 830%), followed by Scangroup (621%), Safaricom (453%), and Access Kenya (363%). The least oversubscribed IPO was found to be Mumias (60%), followed by Britam (61%), and Cooperative Bank (70%).

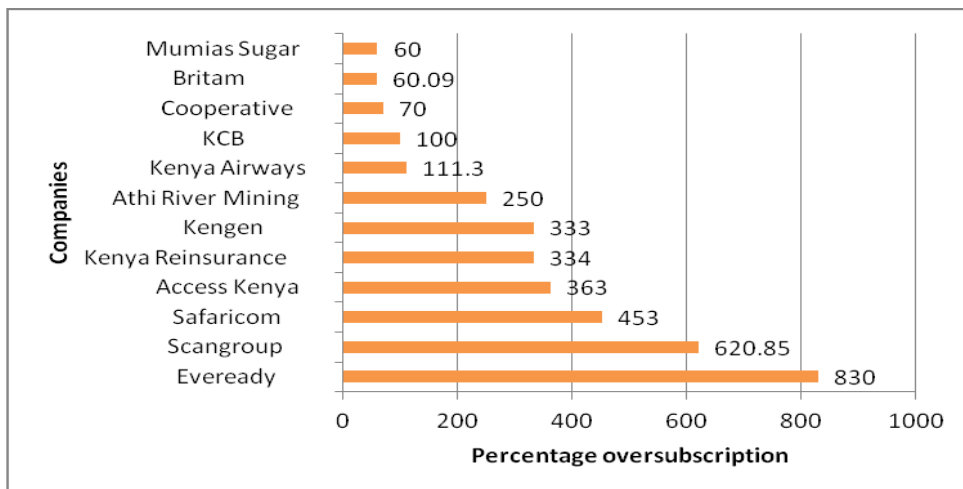


Figure 3: Percentage subscription of the IPOs in the study



A One-way ANOVA results of a within-subjects factor of short-run underpricing and between-subject factor of type of industry was found not to be statistically significant, $F(2, 11) = 0.82, p = .47$. This implied that short run underpricing was not significantly different among firms in different sectors: commercial and services ($N = 4, \text{Mean} = 58.07\%, \text{SD} = 56.06$), finance and investment ($N = 4, \text{Mean} = 20.58\%, \text{SD} = 33.84$), and industrial and allied ($N = 4, \text{Mean} = 87.43\%, \text{SD} = 110.00$). An Independent Samples t-test indicated that there were no significant differences in initial return between companies wholly owned by private entities at the time of the IPO ($M = 66.97\%, \text{SD} = 67.92$) and those partly owned by the GoK ($M = 49.55\%, \text{SD} = 78.83$), $t(10) = 0.376, p = 0.715, 95\% \text{ CI } [-85.90, 120.74]$.

The Pearson's correlation results between the age of the company at IPO, amount of funds raised at IPO, the percentage subscription of the shares offered and initial return is presented in Table 3.

Table 3: Correlations between initial return and age, amount of funds raised and percent subscription

Variable (n = 116)		Initial return	Firm age	Funds raised	Percent subscription
Initial return	r	1			
Firm age	r	-0.412	1		
Funds raised	r	0.050	-0.280	1	
Percent subscription	r	0.585*	-0.378	0.130	1

r = Pearson correlation coefficient; * = correlation significant at .05 level

A significant, moderate and positive relationship was found between percentage subscription and initial return ($r=0.59, p=0.046$). This showed that the more an IPO was oversubscribed, the more the abnormal return that ensued. This suggested that more underpricing occurred when investor sentiment was ebullient. On the other hand, initial return had no significant relationship with either the age of the firm ($r=-0.41, p=0.184$) or the amount of funds raised ($r=0.05, p=0.878$). Thus, underpricing occurred regardless of the age of the company or the size of IPO.

An independent – samples t-test indicated that short run underpricing was significantly higher during 'bullish' markets (between 2005 and May 2008) ($N = 7, M = 90.86\%, \text{SD} = 78.05$) than during 'bearish' markets (1996 to 2000 and after May 2008 to 2011) ($N = 5, M = 5.66\%, \text{SD} = 10.37$), $t(6.29) = -2.85, p = .028, 95\% \text{ CI } [-157.44, -12.95]$. Thus, significant short run underpricing is likely to occur during 'bullish' rather than in 'bearish' markets. A Pearson's correlation indicated a significant, positive and strong relationship between market sentiment and initial abnormal return ($r=0.71, p<.05$), suggesting that more significant underpricing occurred during bullish rather than bearish markets. The results obtained when initial return was regressed on market sentiment are presented in Table 4.

Table 4: Regression results between initial return and market sentiment

Variable (n = 12)	B	SE B	B
Constant	5.662	27.195	.603**
Market sentiment	85.194	35.607	

$R^2 = .364$; Adj. $R^2 = .30$ ** $p < .05$



The simple linear regression showed that market sentiment could explain about 36% of the variation in initial return, which was relatively high. If this model had been derived from the population rather than the sample, then it would have accounted for approximately 30% of the variance in the dependent variable, which is just about 6% less than what the model explains. This study found a significant regression equation, $F(1, 11) = 5.725, p=0.038$, suggesting that there was likely to be a linear relationship between market sentiment and initial return and the population value for multiple R^2 is not 0. The regression coefficient for market sentiment was 85.194 and was statistically significant at $p<.05: t=2.393, p=0.038$). This suggested that market sentiment was a significant predictor of abnormal initial return. The B coefficient of 85.194 suggested that when market sentiment increases by one unit on its scale (that is, moves from bear to bull market), abnormal initial return by about 85%. The standardized beta (β) coefficient was 0.603, which implied that an increase of one standard deviation in market sentiment would result in an increase in abnormal return by 60% of its standard deviation.

Hence, using the constant and the B coefficient for market sentiment, an estimated prediction (regression) equation for this model could be written as follows:

$$\hat{Y} = 5.662.041 + 85.194X + \epsilon$$

DISCUSSION

The study found an average underpricing of 55.36% and a median underpricing of 24.71%, with all companies except Britam having its offer price under-priced. This finding is in line with many studies that have documented underpricing of IPOs. The average underpricing of 55.36% in this study is only slightly higher than that found by Tenai *et al.* (2011) of 49.44% in a study of 13 companies, which offered IPOs at the NSE between 1994 and 2008. Although he did not document the exact value of underpricing of IPOs, Nderi (2009) acknowledged its existence on NSE in a survey of eight companies, which offered IPOs between January 2006 and December 2008 to investigate firm specific determinants of the phenomenon. Cheluguet (2008) estimated that underpricing of newly issued IPOs on the NSE was over 40.28 per cent. In a sample of 25 IPO on the NSE, Fredrick (2012) found a mean and median underpricing of 42% and 15.49%, respectively, which reflects the results from this study. Underpricing has been found in other studies, for instance, Loughran and Ritter (2002) and Barker (1999).

Short run underpricing was similarly distributed, regardless of whether the firm belonged to commercial and services, finance and investment or industrial and allied sector. Analogously, underpricing was recorded regardless of the nature of ownership of the firm at the IPO, age of company or the size of the IPO offered. Although the sample size was small and could therefore reduce the power of statistical tests to discriminate significant differences (Gigerenzer, 1993), the results mirror other studies that have reported underpricing of IPO issues, in a wide range of industries, over broad times, and with variant IPO sizes. For instance, Ritter (2003) reported that underpricing was a common phenomenon in several countries around the world, regardless of the type of sector the company belonged. Chambers and Dimson (2009) showed that underpricing have plagued British IPOs since World War 1 to the present. Studies by Stoll and Curley (1970) and Ibbotson (1975) have documented underpricing in the 1970s, and this phenomenon has continued to date (Hrnjic and Sankaraguruswamy, 2011).



Regression analyses revealed that the prevailing market sentiment is a significant predictor of abnormal initial return, with more significant underpricing occurring during bull markets compared with bear markets ($\beta = .603$, $t = 2.393$, $p = 0.038$). The results were supported by correlation analysis, in which more significant underpricing occurred during bullish compared with bearish markets ($r = 0.71$, $p < .05$). In addition, this study found that more underpricing occurred whenever there was more oversubscription, which buttressed the conclusion that exuberant investor sentiment was positively related with underpricing. This finding is consistent with observations by financial market observers, particularly during the exuberant market for technology stocks in the late 1990s, have suggested that periods of high initial returns to IPOs are associated with excessive demand for IPOs and that this high demand subsequently attracts new issuers of a lower quality (Loughran and Ritter, 2004). Results from this study appear to lend credence to the theory of “investor sentiment”, in which companies carrying out an IPO in hot issue markets often experience significant short run underpricing. This could result from institutional investors being given underpriced shares as a compensation for holding inventory stock that could be subjected to unpredictable behaviour by sentiment investors (Ljungqvist *et al.*, 2006). In addition, during “bull” markets, since the demand for new issues is overly high, this could result in the observed high initial returns (Hrnjic and Sankaraguruswamy, 2011). This study is probably the first in Kenya to demonstrate empirically the prevailing market sentiment could be an important factor that influences initial abnormal return of an IPO.

CONCLUSION AND RECOMMENDATIONS

This study analysed the effects of IPO timing on underpricing of shares of companies listed on the NSE. The study concluded that a significant underpricing of IPOs occurs on the NSE, with an average underpricing of 55.36%. Short run underpricing was always found, regardless of the type of industry, the nature of ownership of the firm, age of the company or the size of the IPO offer. However, the study found that the more an IPO was oversubscribed, the more the abnormal return that ensued. Prevailing market sentiment was found to be a significant predictor of abnormal initial return, with more significant underpricing occurring during bull markets compared with bear markets. The regression model predicts that bull markets increases initial abnormal return by about 85%. The study found evidence for the importance of “investor sentiment” in explaining short run underpricing.

The study recommends that investors should rationally analyse each company performance and history before investing in the IPO, rather than joining the ‘band wagon’ of investment as oversubscribed issues experience more significant underpricing. Investors looking for short term investments should invest in IPOs during bullish rather than bearish markets because there is significant underpricing in the former market.

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