Journal of Finance and Economics, 2020, Vol. 8, No. 3, 93-99
Available online at http://pubs.sciepub.com/jfe/8/3/1
Published by Science and Education Publishing
DOI:10.12691/jfe-8-3-1

Can a Company's Pre-IPO return on Assets (ROA), Return on Equity (ROA) and Initial Returns Predict Post-IPO Performance?

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Received April 04, 2020; Revised May 06, 2020; Accepted May 13, 2020

Abstract Initial Public Offerings (IPOs), the offering by companies of stock to the public for the first time, have long been characterised by two anomalous phenomena: an abnormal increase in share price on the first day of trading and a long-run decline in performance. Some researchershave suggested that long run performance of IPOs could be a function of the firm's pre-IPO performance and initial returns. However, few studies have looked at these relationships in listed companies in Kenya. The objectives of this study were to determine the relationship between pre-IPO and post-IPO performances of companies listed on NSE, and assess the relationship between initial return and post-IPO performance of the companies. An explanatory survey design was adopted for the study. 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. The study analysed company data (prospectuses and annual statements). In addition, daily stock share prices, volumes and NSE indices were collected from the NSE. The study found an average under-pricing of 55.36% and a median under-pricing of 24.71%. The average CAR, M= -0.98, SD=2.08, $t(11)$ = -1.97, p<.05, and ROE, M= -10.07, SD=24.0, z= -1.96, p<.05, were significantly less in three years after an offering than in three before the offering, suggesting a decline in company performance after the offering. Both pre-IPO ROA and ROE could not predict post-IPO ROA and ROE, respectively. Moderate and statistically significant negative relationships were found between initial return and both ROA and ROE differentials, showing that companies with larger abnormal returns had poor long run performance. The study recommends that investors looking for investment in IPOs must study more firm's statistics, not just ROA and ROE, before choosing to buy stock.

Keywords: *initial return, ROA, ROE*

Cite This Article: Joseph K. Mutai, "Can a Company's Pre-IPO return on Assets (ROA), Return on Equity (ROA) and Initial Returns Predict Post-IPO Performance?" *Journal of Finance and Economics*, vol. 8, no. 3 (2020): 93-99. doi: 10.12691/jfe-8-3-1.

1. 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 [1]. IPOs have long been characterized by two puzzling phenomena. One of these is called initial return or first day return, which is the difference between the price obtained by the shares at the close of the first trading day and the price of the offer, adjusting for the market return in that same period [2]. [3,4,5,6] were the first researchers to document the apparent huge increase in the share price on the first day of trading relative to the offer price. Initial return is also referred to as underpricing, as the offer price appears to be lower than the actual value of the firm, or abnormal return, because of the anomalous increase in the share price in an analysis of 332 IPOs on the Shanghai Stock Exchange from 2001 to 2011 found a massive underpricing of 93.42% on average. [7] 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. [7] reported underpricing, regardless of the type of industry.On the other hand, [8] in a study of British IPOs since World War 1 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). 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 [9].

The second element that has been found to characterize post - IPO performance of companies is the deterioration in the performance of the stock price in the years after the offering, a phenomenon termed long-run decline in performance. Researchers such as [10] in the USA, [11] for the UK market, and [12] for the Japanese market all demonstrated a decline in newly issued public firms' return on assets relative to their pre-issue levels. Efficient markets proponents would argue that once an IPO is publicly traded, it becomes just like any other stock and thus the aftermarket stock price ought to reflect the shares' intrinsic value. As a result, risk-adjusted post-IPO stock price performance should not be predictable. For instance, [13] in a study of Bangladesh IPOs found that they underperformed by as much as 10.19% per year after investing after the IPO relative to the market. [14] found that three-year returns from 1,526 initial public offerings made between 1975 and 1984 in the USA averaged 34.47% compared to a control sample of 1,526 firms matched for industry and size, which returned 61.86% over the same period. [15] examined initial public offering from 1970-1990 and found an average rate of return of only 5% per year for the five years after issuance, compared to 12% for firms of comparable size. [16] examined the three year performance of 712 United Kingdom IPO's issued between 1980 and 1988 and found underperformance that varied between 8.3% and 23.0%, depending on the benchmark chosen.

Researchers have proposed multiple theories to account for abnormal return and long-run decline in performance. Underpricing theories generally fall into three categories: asymmetric information, symmetric information and behavioural. The key parties during an IPO are the issuing firm, the bank underwriting the deal, and outside investors. Information asymmetry theories assume that one these parties has more information than others, leading to information frictions that lead to abnormal returns. These theories include adverse selection models, where uninformed investors are induced to participate in IPOs by lowering the offer price [17], signaling model, in which high-quality issuers 'signal' their quality by deliberately selling their shares at a lower price [1], and the hazard model, where issuers compensate underwriters for their information [18]. Information symmetry theories assume uniform distribution of information among the three IPO parties. They include prospect theory [19], in which managers don't care about losing money during under-pricing, since their unsold stock will gain when the share price jumps on the first day while [20] argued that issuers underprice their shares to reduce their legal liability. Behavioral theories assume the presence of irrational (sentiment or noise) investors, who show irrational exuberance, over optimism, and over enthusiasm about investment opportunities without any relevant justification [21]. Since investor sentiment is transient, institutional or regular investors ('arbitrageurs') receive discounted shares to compensate them for shares they hold in inventory when the 'hot market' ends [22].

Some of the antedating theories also explain long run underperformance. Poor companies take advantage of bullish markets (windows of opportunity) to issue IPO when investors have overly optimistic expectations about the firm's future performance [19]. Such firms naturally perform poorly in the long run. In the 'divergence of opinions and price' model, as the most optimistic investors buy an IPO, over time, as the variance of opinions decreases, the marginal investor's valuation will converge towards the mean valuation, and its price will fall [23]. In the agency theory, a decrease in management ownership when a company goes public, leads to an increase in agency costs and reduces the managers' incentives for value maximization [24].

A plethora of antecedent factors have been suggested to explain long run performance of IPOs. Some researchers, for instance, have suggested that long run performance of IPOs could be a function of the firm's pre-IPO performance before going public. In addition, initial return could predict long run performance. The utility of such studies is instantly obvious, allowing potential investors to choose the best IPOs to invest, by analysing past company performance and initial return. However, such studies have yielded confounding results. For instance, [25] found no systematic relationship between initial returns and after market returns. [26] concluded that while pre-IPO performance of a firm cannot predict the post-IPO performance perfectly, investors should show caution while analyzing firms offering IPOs. The authors found that firms with high costs of flotation, high profits before listing, high abnormal returns and high equity offers may perform poorly in the long run. [27] find that underpricing has an insignificant explanatory power in predicting the post-issue operating performance, indicating that there is no positive relation between underpricing and the long-run performance. [28] divides the IPO sample into two groups based on their initial underpricing and finds no evidence of more underpriced firms having superior performance. [6] reported a negative relation between initial Returns at the IPO and long-run share price performance for a sample of US IPOs issued during the period 1960-1969. The objectives of this study were to (1) determine the relationship between pre-IPO and post-IPO performance of companies listed on NSE, and (2) assess the relationship between initial return and post-IPO performance of companies listed on NSE.

2. Methodology

The study targeted all the 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. Since the target population was small, the entire population (census) of the companies was used in the study. The study analysed company data (prospectuses and annual statements). In addition, daily stock share prices, volumes and NSE indices were collected from the NSE. The design of the study was explanatory survey. The variables in the study consisted of abnormal return (first-day return or initial return) and three constructs representing long-run performance of companies: cumulative abnormal returns (CAR), return on assets (ROA) and return on equity (ROE).

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):

$$Rr_{i1} = \left[\left(\frac{P_{i1}}{P_{i0}}\right) - 1\right] x100\% \quad (1)$$

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.

CAR, ROA, and ROE measured long-run performance of each firm. The CAR was calculated from daily changes in a firm's stock price over a period of 36 months after an IPO compared to daily changes in the NSE 20 - Share index, a weighted index calculated from 20 selected companies on the NSE, which was used as a benchmark return. To calculate CAR, daily returns for each company stock and the NSE-20 share index were computed for the study period. A regression model (equation 2) was used to determine the relationship between the daily rate of return of a particular company and the daily market return.

$$R_t = a + bR_m \quad (2)$$

Where, $R_t$is the rate of return to the stock for each day, a is the intercept of the regression, b is the slope of the regression line, and R_m is the rate of market returns for each day. The expected returns computed using the equation 2 were subtracted from the actual stock returns to derive the abnormal returns for each day (equation 3):

$$AR_t = R_t - E(R_t) \quad (3)$$

Where, AR_t is the abnormal rate of return for each day, $R_t$is the rate of return on the stock, while $E(R_t)$ is the expected rate of return. The cumulative abnormal returns were then obtained by summing up the abnormal return for each company in the study period. It was expected that if the market was efficient, the cumulative abnormal returns for each firm in the study would equal to zero. A t-statistic was therefore computed to determine whether CAR was significantly different from zero.

In addition, two financial measures of profitability, ROA and ROE of the sample companies were computed for three years pre- and three years' post- IPO to determine long-run performance. Means and medians in the study were compared by t-test and Mann Whitney tests, respectively. Relationships were tested using Pearson's correlation coefficient or when data contained outliers, the non-parametric Spearman's correlation was computed. All statistical tests were two-tailed. Significant levels were measured at 95% confidence level with significant differences recorded at $p<0.05$.

3. Results

3.1. Initial Return

All companies in the study, except Britam, experienced an underpricing on the first day of trading. The study found an average underpricing of 55.36% (Table 1) and a median underpricing of 24.71%. 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 1. Initial return performance

Company	IPO year	Prospectus price (P_o) 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 (3rd 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.

3.2. Long run Performance of Companies

The cumulative abnormal returns (CAR) over a period of 3 years (including their t statistics) are summarised in Table 2.

Table 2. CAR for the twelve companies in study

Company	CAR	t-statistic
Safaricom	-3.45	2.04*
Cooperative	-1.72	-6.41*
Britam	-3.13	9.02*
Scangroup	0.0023	0.307
Access Kenya	2.98	3.39*
Eveready	-1.97	-5.49*
Kengen	-4.14	-1.15*
Kenya Reinsurance	0.22	0.76
Mumias Sugar	0.202	0.348
KCB	-0.0013	-5.79*
Kenya Airways	1.04	5.07*
Athi River Mining	-1.78	-1.10*
Average	-0.979	-1.97*

Key: * CAR is significantly different from 0 by the t-test ($p<0.05$).

The average CAR for all the 12 companies was -0.979 and was significantly different from zero at p<.05, which indicated that the stock of the companies in the study generally underperformed the market index after issuing the IPO.

3.3. ROA

The results indicated that the ROA were significantly higher in the pre-IPO than in the post-IPO period for three companies: Safaricom, Eveready, and Kengen. On the other hand, ROA for Cooperative Bank, Kenya Reinsurance, and Kenya Airways were significantly higher in the post-IPO era than in the pre-IPO period. The mean and median ROA for all the companies in the post-IPO period was 5.77 and 6.09, respectively, whereas the mean and median ROA in the pre-IPO period was 7.27 and 7.11, respectively, suggesting a decline in ROA in the long run upon issuing an IPO. However, the difference was not significant by the Mann-Whitney test U test, z = 0.13, p>.05. Thus, overall, median ROA was found not to be significantly different between pre- and post-IPO periods (Table 3).

3.4. ROE

The ROE was found to be significantly higher in the three years leading to the IPO than in the three years following the offering in Safaricom, Scangroup, Eveready, Kengen and ARM. On the other hand, ROE was significantly higher in the post-IPO than in the pre-IPO period for only one company, Kenya Airways. The mean and median ROE for all the companies in the post-IPO period was 12.0% and 12.19%, respectively, whereas the mean and median ROA in the pre-IPO period was 22.16% and 20.23%, respectively. This difference was found to be statistically significant by the Mann-Whitney U test, z= -1.96, p<.05, suggesting that there was a general decrease in the ROE in the long run upon issuing a public offering. Thus, most companies performed poorly following IPO issue relative to before the offering (Table 4).

3.5. Relationship between Pre-IPO and Post-IPO Performance of Companies

The highest Cook's distance was .102 and .688 (for ROA and ROE, respectively) while the maximum leverage value was .490 and .349 which were less than one and two, respectively. This indicated that no single case exerted undue influence on regression coefficients, hence, there were likely to be no extreme outliers in the data. Thus, no case was deleted from the analysis. Homoscedasticity was examined via several scatter plots and these indicated reasonable consistency of spread through the distributions.

The results obtained when post-IPO ROA and ROE were regressed on pre-IPO ROA and ROE, respectively are presented in Table 5.

Table 3. Return on assets pre- and post-IPO for the companies in the study

Company	Period	Mean	Std. Dev.	Median	Mean diff (pre - post IPO)	z- statistic
Safaricom	Pre-IPO	19.1654	2.12905	19.17	-6.63	-1.96*
	Post-IPO	12.5330	1.74582	11.55		
Cooperative	Pre-IPO	1.5914	.74269	1.51	1.36	-1.96*
	Post-IPO	2.9487	.25149	2.97		
BA	Pre-IPO	3.2428	6.78964	1.61	2.14	-0.66
	Post-IPO	5.3798	1.80909	5.65		
Scangroup	Pre-IPO	10.3979	3.49639	10.07	0.45	-0.22
	Post-IPO	10.8446	2.82688	10.19		
Access_Kenya	Pre-IPO	4.6652	.34791	4.47	-0.08	-0.66
	Post-IPO	4.5896	4.35523	5.98		
Eveready	Pre-IPO	24.1403	2.64488	22.86	-22.24	-1.96*
	Post-IPO	1.9026	1.06340	2.13		
Kengen	Pre-IPO	6.2226	.45912	6.12	-2.95	-1.96*
	Post-IPO	3.2723	1.95470	2.39		
KenyaREins	Pre-IPO	6.1846	2.04806	6.15	3.53	-1.96*
	Post-IPO	9.7127	1.40889	8.94		
Mumias_Sugar	Pre-IPO	5.3393	6.60654	7.13	4.49	-1.09
	Post-IPO	9.8256	1.65007	9.21		
KCB	Pre-IPO	1.1267	.08963	1.08	-0.23	-0.66
	Post-IPO	.8967	.61199	1.25		
Kenya_Airways	Pre-IPO	1.4767	.10786	1.43	1.06	-1.96*
	Post-IPO	2.5333	.25166	2.5		
Athi_River_M	Pre-IPO	3.6817	.40737	3.58	1.11	-0.66
	Post-IPO	4.7898	3.27100	5.97		
Average	Pre-IPO	7.27	1.21	7.11	-1.50	0.13
	Post-IPO	5.77	0.73	6.09		

Key: * medians are significantly different by the Mann-Whitney U test.

Table 4. Return on Equity pre- and post-IPO for the companies in the study

Company	Period	Mean	Std. Dev.	Median	Mean diff (pre - post IPO)	z- statistic
Safaricom	Pre-IPO	38.44	1.97	38.16	-16.97	-1.96*
	Post-IPO	21.47	2.52	20.59		
Cooperative	Pre-IPO	17.63	6.52	17.94	4.61	-1.09
	Post-IPO	22.25	3.73	22.93		
BA	Pre-IPO	12.09	26.49	2.29	3.75	-0.66
	Post-IPO	15.85	4.27	15.67		
Scangroup	Pre-IPO	66.11	8.46	63.02	-41.91	-1.96*
	Post-IPO	24.21	14.13	16.95		
Access_Kenya	Pre-IPO	10.83	0.94	10.86	0.66	-0.66
	Post-IPO	11.48	10.87	15.25		
Eveready	Pre-IPO	68.13	9.12	67.51	-63.40	-1.96*
	Post-IPO	4.73	2.51	4.87		
Kengen	Pre-IPO	11.03	0.91	10.70	-5.77	-1.96*
	Post-IPO	5.26	2.92	3.84		
KenyaREins	Pre-IPO	12.97	4.43	13.02	2.80	-1.09
	Post-IPO	15.39	2.02	14.60		
Mumias_Sugar	Pre-IPO	10.48	13.32	14.65	4.91	-0.22
	Post-IPO	15.39	1.74	16.04		
KCB	Pre-IPO	0.66	7.57	3.62	2.93	-0.22
	Post-IPO	3.58	0.98	3.50		
Kenya_Airways	Pre-IPO	-4.00	8.72	-8.00	19.33	-1.99*
	Post-IPO	15.33	4.61	18.00		
Athi_River_M	Pre-IPO	21.56	23.76	8.75	-31.77	-1.96*
	Post-IPO	-10.21	10.74	-13.44		
Average	Pre-IPO	22.16	5.70	20.23	-10.07	-1.96*
	Post-IPO	12.09	2.81	12.19		

Key: * medians are significantly different by the Mann-Whitney U test.

Table 5. Regression results between pre- and post-IPO ROA and ROE

Panel A: ROA Variable (n = 12)	B	SE B	β	p-Value	R^2 (Adjusted R^2)
Constant	4.588	1.638			
preROA	0.162	0.163	0.301	0.341	0.091 (0.000)
Panel B:ROE					
Constant	10.682	4.123			
preROE	0.064	0.131	0.152	0.637	0.023(-0.074)

Key: preROA and preROE = pre-IPO ROA and ROE, respectively.

The results suggested that both pre-IPO ROA and ROE could not predict post-IPO ROA and ROE, respectively.

3.6. Relationship between Initial Return and Long-run Performance

A Spearman's Rho correlation showed a moderate and negative correlation between the ROA differential (post-IPO ROA subtracted from pre-IPO ROA) and initial returns of the companies, rho= -0.62, p<0.05 (Table 6).

Table 6. Correlations between initial return and long-run performance of companies

Variable (n = 12)		Initial Return	CAR	ROA differential	ROE differential
Initial return	r	1			
CAR	r	-0.112	1		
ROA	r	-0.615*	0.413	1	
ROE	r	-0.573*	0.399	0.615*	1

r = Spearman's correlation coefficient; * = correlation significant at .05 level (2-tailed).

As with ROA, a moderate, negative, and statistically significant correlation (r= -0.57, p=.049) was found between abnormal return of the companies and ROE differential (Table 6).

4. Discussion

The study found an average underpricing of 55.36% and a median underpricing of 24.71% for all the companies in the study except one. The average underpricing of 55.36% in this study is only slightly higher than that found by [29] of 49.44% in a study of 13 companies, which offered IPOs at the NSE between 1994 and 2008. Underpricing has been found in other studies, for instance, [1] and [30].

The results showed that both pre-IPO ROA and ROE could not predict post-IPO ROA and ROE, respectively. This suggested that analyzing a firm's ROA and ROE a few years to IPO may not give a clear indication on how the company's ROA and ROE are going to change after

the issue. This is in line with studies by [25] and [26] who found no systematic relationship between pre-IPO performance of a firm and its post-IPO performance. The results imply that potential buyers of stock must delve deeper in a firm's statistics, beyond mere ROA and ROE, before making an informed choice on whether or not to buy the shares of the company.

A moderate and negative correlation was found between the ROA differentialand initial returns of the companies. Thus, companies with greater abnormal returns had higher ROA in the pre-IPO period but lower ROA in the post-IPO period. Therefore, companies with larger abnormal returns tended to underperform (with regard to ROA) in the post-IPO period. Similarly, a moderate, negative, and statistically significant correlation was found between abnormal return of the companies and ROE differential, indicating that companies with larger abnormal returns tended to underperform, with regard to ROE, in the post-IPO period. These findings contradict those by [25], who found that long run performance of IPOs is better for companies that experience higher initial returns relative to those with lower initial returns, and [27], and [28], who found no relationship between underpricing and long run performance. However, this study's results support those of [26] and [6], in which companies with higher abnormal returns experienced poor performance in the long run.This study's findings appear to support the 'divergence of opinions and price' model or 'existence of fads', in which, with the passage of time, as the variance of opinions decreases among investors, the marginal investor's valuation converge to a mean valuation, causing its price to fall. However, the study found no evidence for the signalling model (since high quality issuers should have had the highest abnormal returns but should have performed well post-IPO) or prospect model (as the share price should have performed highly after IPO issue).

5. Conclusion and Recommendations

This study analysed the relationship between pre-IPO and post-IPO performance of companies listed on NSE, and assessed the relationship between initial return and post-IPO performance of the companies. The study concluded that a significant underpricing of IPOs occurs on the NSE while CAR of the stock of IPOs on the NSE generally underperforms the market index for a three-year period after issuance. Generally, there is a long run decline in ROA and ROE for companies in a three-year period after their public offering.

The study found that both pre-IPO ROA and ROE could not predict post-IPO ROA and ROE, respectively. Moderate and statistically significant negative relationships were found between initial return and both ROA and ROE differentials, which showed that companies with larger abnormal returns tended to underperform, with regard to both ROA and ROE, in the post-IPO period.

The study recommends that investors looking for investment in IPOs must delve deeper in a firm's statistics, beyond mere ROA and ROE, before making an informed choice on whether or not to buy the shares of the company.

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