



Nexus between Firm Ownership, Board Composition and Initial Public Offering Stocks Performance at the Nairobi Securities Exchange in Kenya

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Abstract

Extant literature has globally demonstrated two anomalies of initial public offering stocks performance: positive initial returns and long run underperformance. Kenya's IPO market is experiencing a downward trend. The last issue was in 2015. Bond market has gained traction compared to equity market. Studies have associated firm specific factors to IPO stocks performance and ignored the moderating variable of automation. The study analysed the relationship between firm ownership, board composition and IPO stocks performance at NSE. The percentage of shares owned by the Kenyan government was used to measure firm ownership and board composition was measured by percentage of executive board members to total board members. The performance of IPO stocks was measured using both Cumulative Abnormal Returns and Buy and Hold Abnormal Returns. Automation was measured by IPO stocks performance between pre and post automation period. The sample size was 15 firms which floated shares between 1994 and 2019 with 2,586 observations. Secondary source was used to collect data. Longitudinal and descriptive study designs were used together with multiple linear regression to analyse the data. To determine between fixed and random effects, the study used Hausman test. It was established that both firm ownership and board compositions correlated negatively with IPO stocks performance. Automation on the other hand was positively correlated with board composition but did not correlate with firm ownership. This study will assist the Kenyan government in developing financial stability measures and investors in making informed decisions.

Keywords:

Automation
Firm board composition
Firm ownership
Initial public offerings
Nairobi securities exchange.

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1. Introduction

The stock exchange market in Kenya started in the 1920s when the rules that govern stock broking activities has not been developed (Kemboi & Tarus, 2012). Trading took place based on gentlemen's agreements where contractual commitments were implemented by the parties making good of their delivery and settling costs (Nyasha & Odhiambo, 2014). The first professional brokerage firm was in 1951 by Francis

Drummond. In 1954, a group of stock brokers voluntarily came together and were registered under the Societies Act. This was the birth of Nairobi Securities Exchange.

Three years after Kenya's independence in 1963, the stock market witnessed stability in growth hence attracting more participants in the market. A number of issues were oversubscribed. The advent of the oil crisis in 1972 led to inflation whose effect was to reduce the value of shares (Aduda, Masila, & Onsongo, 2012). The NSE (2022) indicated that the security exchange plays a critical role in growth of Kenya's economy through encouragement of savings and investments thereby enabling local and international firms to access funds which increases financial inclusion. In 2004, the depository and settlement operations were automated while the NSE was automated in 2006. Subsequently, Wide Area Network and installation of a Broker Back Office were implemented in 2007 and 2011 respectively. In 2012, the automated market surveillance system called Capizar was launched. These series of developments transformed Kenyan securities market to globally accepted standards. Exchange and securities investors should enjoy the benefits of technology enhancement with operationalization of electronic trading platforms (Onyuma, 2020).

Some of the activities of automation of securities markets include computerization of systems and electronic trading. Automated trading is a microelectronic trading which focus on computer algorithms for policymaking and implementation of order submission (Attafuah, 2020). Electronic trading improves efficient settlement thereby reducing transaction processing costs and associated risks (Simiyu, Osero, & Odoyo, 2014). Enhancement of technology benefits both the Capital markets automation and all the players in the sector (Omuchesi, Bosire, & Muiru, 2014).

In the applied studies the concept of moderation is internal and soft in approach. On the other hand, the concept of mediating (or intervening) is external and hard as well as harsh in approach (Pokhariyal, 2019). Further, Baron and Kenny (1986) posit that a moderator can be qualitative or quantitative in nature affecting the direction or strength of the relationship between an independent and a dependent variable.

In China, Hanbing, Jarrett, and Pan (2019) using both CARs and BHARs found that the IPOs underperformed the matched companies over a three year period by -0.18446 and -0.01284 respectively. On the other hand, Esumanba, Kpanie, and Bawuah (2015) using age, cost of debt, hot market, leverage and industry variables between 1990 and 2009 found that Ghanaian stocks were underpriced on initial trading day. Wamari (2014) used BHARs in Kenya between 2000 and 2006 and found mixed results on underperformance with the following firms showing growth in returns: Kenya Reinsurance, Access Kenya and Equity bank. However, Scan group and Mumias Sugar recorded a drop in performance. He further observed a non-significant stock under performance in the long run when the analysis was done using share price, earnings per share and price earnings ratio on seven selected companies.

IPO stocks provide a life line to long term funds to firms. Philippe (2012) established that Global IPO volume amounted US\$ 280 billion in 2010. An amount of Kshs 13 billion was raised from IPO stocks in Kenya between 2006 and 2021 (Capital Markets Authority, 2021). However, United States of America experienced a decline in IPO firms from an average of 310 annually between 1980 and 2000 to 99 from 2000, Gao, Ritter, and Zhu (2013). According to Central Bank of Kenya (2020) Kenya's equity market declined by 17% in 2020 compared to 21% increase in 2019.

A number of gaps were experienced in the previous studies ranging from period of study, number of firms and analytical tools used. For instance it was observed that Marc, Khurshed, and Mudambi (2006) used only three year period to study the relationship between the size of firms and IPO stocks performance in the United Kingdom. Similarly, Kinyanjui (2015) used only six years when he studied performance of IPO stocks in Kenya. Mburugu, Nyamute, Iraya, and Mwangi (2017) on their part used six firms to analyze the effects in the Kenya's securities market IPOs performance in the long run. Gatumo (2017) regressed the raw return against indicators of short run IPO performance at NSE while Amoll (2015) used SPSS.

Globally performance of IPO stocks has been characterized by the anomaly of initial positive returns which turn to long run underperformance. During the study period from 1959 to 2019, Loughran, Ritter, and Rydqvist (2020) established positive initial IPO returns with of 3.30% in Russia and a high of 270.10% in United Arab Emirates. Mumtaz and Ahmed (2016) globally analyzed 20 studies on long run IPO performance in over 10 countries during the period of 1994 to 2008 and established average underperformance of - 22.3 % within an average trading period of 42 months. In Kenya, Mburugu (2021) established that during the five year period from 2007 to 2014, the mean long run IPO price CAR at NSE was -0.49% and Chibeka (2014) established Kenya's highest under-pricing of 236% based on initial returns of IPOs from 1994 to 2016. The returns from trading in shares in Kenya declined by 17% in 2020 as opposed to an increase of 21% in 2019 (Central Bank of Kenya, 2020). This has made the fixed income securities to surpass the equity market.

The IPO stocks performance play a crucial role in an economy by offering long-term as well as short-term capital to companies thereby giving them an opportunity to access more liquidity as they grow their capital base. Globally, in the second Quarter of 2021 IPO deal numbers and proceeds were 597 raising US\$111.6 billion (Ernest and Young Global, 2021). In 2019 alone, Africa, raised US\$ 1.2 billion from 9 IPOs and US\$ 16.9 billion from 215 IPOs between 2010 and 2019 (Africa Capital Markets Watch, 2020). Between 2006 and 2021, 10 firms issued their IPOs at the NSE raising Kshs 13 billion (Capital Markets Authority, 2021). The

capital flight by foreign investors being experienced at the NSE with the second quarter of 2021 recording Kshs 2 billion (African Financial Markets, 2022) will reduce if the IPO stocks performance is stable.

Many researchers are developing interest in firm specific factors due to their complexity and variability with the aim of finding out the relationship between firm specific factors and firm returns especially in the emerging stock markets. These factors could either be internal to the firm or from external forces (Ferdaous & Barua, 2020). Information on firm characteristics influences users on their perception of current and projected performance of a firm (M'muriungi, Muturi, & Oluoch, 2019). The findings from previous studies on firm specific factors and IPO stocks performance are varied and inconclusive. As far as this study is concerned, they did not use moderating variable of automation which is important in determining the extent of the relationship between predictor and response variables as discussed by Namazi and Namazi (2016). The gap of failure to use moderating variable against firm specific factors is what this study intends to fill and might lift the veil on IPO puzzle.

2. Literature Review

2.1. Theoretical Review

Two theories guided this paper: Random walk theory relating to access to information making share prices to have "random walk pattern" behaviour. The current share prices cannot influence the future share prices since they are independent of each other. A stock price therefore has an intrinsic value and fluctuates randomly around it depending upon available information. This theory is relevant to firm ownership since the market prices cannot easily be influenced by the type of shares ownership.

The second theory: Winner's curse theory relating to informed and uninformed bidders outcomes. A win becomes a curse for uninformed bidders when their quotes are an overestimate of the value of the bids which ultimately produces lower normal returns. The winners actually lose. This happens when competitors have bidding strategies which are similar to the winning bidder. This can be applied to investors when they subscribe for shares based on the information provided in the prospectuses and could be a main cause of positive initial returns only to change to long run under performance.

2.2. Empirical Review

Empirical studies have been carried out on efficient market theory with some indicating long run stock performance anomalies whose impact is related to the firm's characteristics. In some cases it was found that the shares returns of small companies were found to be higher than the returns of larger firms (Fawaz & Osama, 2015).

Esumanba et al. (2015) carried out a study on firm specific factors of age, industry, cost of debt and leverage on underpricing in Ghana during the period 1990 to 2009. They undertook empirical analysis of the initial and post-market short-run IPO stock performance. The results of the study showed an underpricing of 8% of the stocks initial trading day.

Rudsengen (2021) used a sample of 326 firms from Sweden, Finland, Denmark and Norway to examine the nexus between board characteristics and short term IPO underpricing. The period of study was between 2001 and 2021. They found a minimum association between board characteristics and the degree of IPO stocks short term underpricing.

Agarwal (2020) used a sample of 235 IPOs between 2009 and 2018 to evaluate underpricing in India. The variables used were board characteristics, share subscription rate, share ownership, and share performance. The study assumed information asymmetry between market participants and found that non-executive directors share holdings had significant effect on subscription rate and equity retention by institutional investors while dual leadership had an impact on IPO underpricing.

In Kenya, Adika, Maru, and Mugambi (2018) analyzed the relationship between board composition and performance of listed firms at the NSE. Return on Equity ratio was applied to measure performance of firms. The study adopted exploratory and descriptive designs. The number of firms studied was 45 from 2007 to 2013. There was a significant positive correlation between board composition measured by non-executive directors and the nationality of directors and firms' performance.

On Jordanian firms, Mohammad and Faudziah (2018) undertook a study on the effect of firm ownership structure on firm performance using 228 firms from industrial and services sectors. The relationship was tested using Ordinary Least Squares regression. The study variables were found to be significantly positively correlated. Odhiambo and Ominde (2015) examined the link between ownership of shares by the government and firm value at NSE. Panel data was used yielding 102 observations from 2003 to 2013. Return on assets and Tobin's Q were used to measure firm value. Property rights and residual claimant theories of corporate governance were applied. At lower levels of ownership, there was no relationship between government ownership and firm performance. However, where the government ownership was beyond 41%, the study found a negative relationship between these two variables.

2.3. Hypotheses Development

The study was carried out to test null hypotheses which were developed based on the research objectives.

2.3.1. Firm Ownership Structure and IPO Stocks Performance at the NSE

The study measured firm ownership structure using the percentage of shares held by the government. Wang (2005) noted that floating of shares through IPO resulted to a change in firm's ownership structure with separation of managerial control and actual ownership. The proxies for IPO stocks performance were CARs and BHARs. An IPO is defined as a stock sold to the market for the first time with the aim of creating liquidity (Ritter, 1998). The success of an IPO is related to the post-market IPO's price performance (Farooq, Akbar, & Alim, 2018). The study tested the following hypothesis:

H₀₁: Firm ownership structure has no significant effect on IPO stocks performance at the NSE in Kenya.

$$\text{Firm ownership} = \frac{\text{No.of shares held by the Kenya government}}{\text{Total shareholding}} \times 100$$

2.3.2. Firm Board Composition and IPO Stocks Performance at the NSE

A percentage of executive to total board members was used to measure firm board composition. Kroll, Walters, and Le (2007) measured top management team board members using the percentage of a board comprising of executives involved with the business and applied (Jacquemin & Berry, 1979) measure of corporate diversification. Hearn (2012) defines board independence using the proportion of executive to non-executive directors.

Three characteristics that measure the monitoring potential of a board are size, composition and leadership structure (Jensen, 1993). Board composition is a combination of executive directors and non-executive directors who are also referred to as independent directors (Weisbach, 1988). The study tested null hypothesis:

H₀₂: Board composition has no significant effect on IPO stocks performance listed at the NSE in Kenya.

$$\text{Board composition} = \frac{\text{Executive board members}}{\text{Total board members}} \times 100$$

2.3.3. Moderating Effect of Automation on Firm Ownership, Firm Board Composition and IPO Stocks Performance at the NSE

NSE was automated in 2006. This comprised implementation of computerized and electronic trading systems. Automated trading is part of microelectronic trading that focus on computer algorithms for policymaking and implementation of order submission (Attafuah, 2020). This study used Case 2 as outlined by Baron and Kenny (1986) since automation is dichotomous given the fact that the periods of study are divided into two – post and pre-automation whereby automation happened in 2006. Similar basis of measurement was applied by Omuchesi et al. (2014) except that the study did not consider implementation period of 54 months in their sample of post automation periods. The study tested the following null hypothesis:

H₀₃: Automation has no significant effect on the relationship between firm ownership, firm board composition and IPO stocks performance at the NSE in Kenya.

Automation= binary of performance of IPO with “0” before and “1” after automation of NSE.

2.3.4. IPO Stocks Share Prices Compared to NSE 20 Share Index

IPO stocks share prices were measured using the closing share prices at the end of each month since the study compared monthly IPO stocks performance. This basis was in tandem with the one recommended by Angga, H., and Jenry (2020). The following null hypothesis was tested:

H₀₄: Performance of IPO stocks is not significantly different from NSE 20 share index as a benchmark.

IPO stocks share prices (performance) = Actual stock share price at closing of the month using both BHAR and CAR.

2.3.5. IPO Stocks Performance Compared to CAPM as a Benchmark

The Capital Asset Pricing Model was first proposed by the American Economist Sharpe (1964) and describes the relationship between the expected return of risk asset and the market or actual return where there is a risk free asset and the beta factor so as obtain the equilibrium price of risky assets (Banz, 1981). The following null hypothesis was tested:

H₀₅: Performance of IPO stocks is not significantly different from CAPM as a benchmark.

CAPM was measured as below:

$$R_{jt} = R_f + \beta (R_m - R_f)$$

Where:

R_{jt} = Required rate of return on firm j stock in month t .

R_f = Risk free rate of return represented by interest rate on CBK treasury bills.

β = Beta coefficient of the security (measure of systematic risk).

R_m = Market return measured by NSE 20 share index return.

3. Research Methodology

Methodology involves the steps to be followed by a researcher aimed at achieving the research objectives. The type of the research methods are informed by what the researcher wants to study and find out (Kothari, 2004).

3.1. Research Design

Descriptive and longitudinal study designs were used. In descriptive design the researcher explains the distribution of one or more variables disregarding causality (Aggarwal & Ranganathan, 2019). Longitudinal studies on the other hand use repeated observations of a phenomenon or individual(s) over a long period of time (Caruana, Roman, Hernández-Sánchez, & Solli, 2015). Event study method was used in determining pre and post automation periods. Pandey and Kumari (2021) stated that event study should comprise of the event window, event date and estimation model. The performance of IPO stocks before and after automation was studied and analysed.

3.2. Target Population, Sampling Frame and Sampling Technique

The study used all 64 listed companies on the NSE. This was split between pre and post NSE automation periods taking 2006 as the year of automation. For each of these periods there were 6 and 9 firms respectively. This population was chosen due to the availability and the reliability of the financial statements which were obtained from CMA and firm websites. The sampling frame comprised of 15 firms which floated shares between 1994 and 2019 with total monthly observations of 2,586. Delisted firms by NSE namely Access Kenya and African Lakes were excluded. Due to the lower number of population, census method was applied by considering all the 15 firms in the sample size. Non probability sampling technique which focuses on specific target group of population was applied. Sampling from a population allows data to be collected faster and at lower cost (Turner, 2020).

3.3. Data Sources and Collection Instruments

The main source of data was secondary information collected using secondary data collection sheets. It was found from firms' financial reports and various websites including Capital Markets Authority, African financials and Omniscience.

3.4. Data Analysis

The data which was made up of monthly CARs and BHARs was regressed and analyzed using STATA statistical software. Data relating to the period from January 1994 to April 1997 was not available.

Table 1. Definition of variables.

Variable	Measurement	Empirical studies
IPO stock performance	CAR and BHAR	M'muriungi et al. (2019); Loughran and Ritter (2002); Sholichah (2018); Bansal and Khanna (2012); Fawaz and Osama (2015); Pandey and Pattanayak (2018); Esumanba et al. (2015); Farooq et al. (2018) Abdul and Muhammad (2020); Chipeta and Jardine (2014); Njogu (2017); Mohammad and Faudziah (2018).
Firm board composition	Percentage of executive to total board members.	Rudsengen (2021); Singh, Maurya, and Mohapatra (2019); Agarwal (2020); Muchemwa, Padia, and Callaghan (2016); Orazalin, Makarov, and Ospanova (2015); Dolvin and Kirby (2016); Eriksen and Aberg (2019); Ali and Teulo (2018); Biplob, Mardi, and Thu (2014); Adika et al. (2018); Ongore, K'Obonyo, Ogutu, and Bosire (2015); Korir and Cheruiyot (2014); Wetukha (2013); Ongoso (2014); Amoll (2015).
Firm ownership structure	Percentage of shares held by the government to total firm shares.	Hoang (2017); Bohdanowicz (2015); Galal and Moustafa (2015); Hoang and Phung (2013); AL-Najjar (2015); Pervan, Pervan, and Todoric (2012); Musallam (2015); Adebisi and Sunday (2011); Mohammad and Faudziah (2018); Gu (2003); Mutisya (2015); Gongera and Nyamboga (2014); Mokaya and Jagongo (2015).
Automation of NSE	Binary – Pre automation and post-automation periods. Automation having taken place in 2006.	Assaf (2015); Omuchesi et al. (2014); Simiyu et al. (2014); Stephen et al. (2013); Mwangi (2015); Attafuah (2020); Onyuma (2020)

Table 1 show the specific independent variables used in the study which were firm board composition and firm ownership with automation of the NSE as the moderating variable. IPO stock performance was the

dependent variable. It further depicts both the measurement bases and previous empirical studies carried out on these variables.

3.5. Model Specification

The study was developed to test the hypotheses. Previous studies that applied similar model are as table: Abnormal Returns was represented by actual return and the expected return found by using CAPM as originally proposed by Treynor (1961); Sharpe (1964); Lintner (1969) and Mossin (1966). BHAR entails purchasing and holding the return of an IPO. The argument in favor of using BHAR measures relatively to CAR is that no monthly rebalancing is assumed.

$$CAR = f[(\beta_0 + \beta_1x_1 + \beta_2x_2 + e_1) + \beta_{0\dots2}] \tag{2}$$

$$CAR = f[\beta_0 + z(\beta_1x_1 + \beta_2x_2 + e_1) + \beta_{0\dots2}] \tag{3}$$

$$BHAR = f[(\beta_0 + \beta_1x_1 + \beta_2x_2 + e_2) + \beta_{0\dots2}] \tag{4}$$

$$BHAR = f[\beta_0 + z(\beta_1x_1 + \beta_2x_2 + e_2) + \beta_{0\dots2}] \tag{5}$$

Where z = event period of automation.

The model was tested before and after automation for each measure of IPO performance where:

x_1 : Firm board composition.

x_2 : Firm ownership.

$\beta_{0\dots2}$: The coefficients representing benchmarks (Nairobi 20 Share Index and CAPM).

$e_{1\dots2}$: Allowance for error terms.

4. Results and Discussions

These are provided together with descriptive and inferential statistics as per the study objectives and hypotheses.

4.1. Descriptive Statistics

The descriptive statistics of the variables are found in Table 2. A total of 15 firms were studied from May 1997 to December 2019 with 2,586 monthly observations based on when the firms floated their shares on NSE. On average, firm board composition comprised of 23.4% of executive to total number of board members. The maximum executive board composition was 50% with a minimum percentage of 8%. Approximately 17% of the total firm shares are held by the Kenyan government with a maximum of 74%. Some firms reported as low as zero percent.

Table 2. Descriptive statistics.

Variable	Observations	Mean	Std. Dev.	Min	Max
Board	2586	0.234	0.083	0.077	0.5
CAPM	2586	0.087	0.043	-0.255	0.279
NSE	2586	-0.001	0.054	-0.226	0.174
Actual	2586	0.067	0.26	-0.623	1.663
AR	2586	-0.02	0.265	-0.705	1.589
CAR	2586	-4.421	17.434	-27.166	114.424
BHAR	2586	357.941	2945.444	-1.119	37813.953
Ownership	2586	0.171	0.22	0	0.739

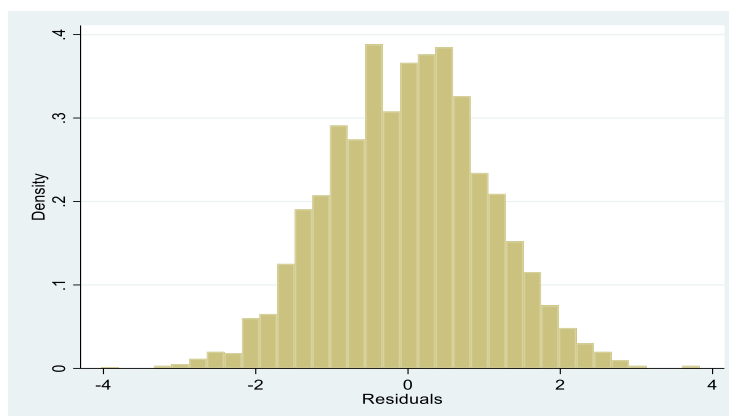


Figure 1. Normality test under CAR and BHAR.

Figure 1 illustrates how the residuals are normally distributed by most of them coalescing at zero.

4.1.1. Normality Tests

The study carried out normality test on the residuals of the fitted regression model for both CAR and BHAR IPO performance measurement methods as shown in Table 3. At 95% confidence level, the test showed that the residuals for both BHARs and CARs models were approximately normally distributed with “p” values of 0.665 which is higher than 0.05. Therefore, the assumption for normality of the residuals was satisfied. The Wilk high value of 0.999 further supports the normality distribution.

Table 3. Shapiro-Wilk W test for normal data.

Variable	Obs.	W	V	z	Prob>z
Residuals_~CAR	2.586	0.999	0.847	-0.425	0.665
Variable	Obs.	W	V	z	Prob>z
Residual~BHAR	2.586	0.999	0.847	-0.425	0.665

4.2. Fixed and Random Effects Regression

Table 4 shows the results of the Hausman test with “p” value of 0.253 which is greater than 0.05 confidence level. This suggests that fixed effect regression model is different from the random effect regression. In conclusion, the random effect is preferred to fixed effect model.

Table 4. Comparison between fixed and random effect regression - Hausman test.

Statistical test	Coef.
Chi-square test value	4.08
P-value	0.253

4.3. Inferential Statistics

Inferential statistics go beyond describing a data set. They are used in drawing conclusions from the descriptive statistics by examining differences in the way study variables are related (Guetterman, 2019).

4.3.1 Performance of IPOs Issued Compared to Two Benchmarks

The study compared the IPO stock performance to that of the bench marked stocks of NSE and CAPM using the independent sample t-test. Table 5 shows the test findings:

Table 5. Independent t test: NSE and CAPM.

Benchmarks/Actual	Observations	Mean1	Mean2	dif.	Std Err	“t” value	“p” value
NSE - Actual	2.586	-0.001	0.067	-0.067	0.005	-13.55	0
CAPM - Actual	2.586	0.087	0.067	0.02	0.005	3.9	0

The results in the table shows that the IPO stocks performance was significantly higher than that of NSE on average $t(5170) = -13.55$, $p < 0.001$. This shows that the IPO stocks performance in the market is better than that of NSE. Comparing the IPO stocks performance to that of CAPM, the study showed that the average return for CAPM was significantly higher than that of the IPO stock performance: $t(5170) = 3.9$, $p < 0.001$. Therefore the IPO stocks performance is below the expected level in the market. These findings are closer to the ones found by Kinyanjui (2015) when he established that Kenya’s IPOs stock performance ranged closely to the benchmark. However, Odipo, Olweny, and Oluoch (2020) found that the firms that issued equity underperformed both the NSE and matching firms and vice-versa for CAPM as bench mark.

4.3.2. Regression Model

The model summary for the panel regression model is presented in Table 6. R-squared value was 0.152 implying that 15.2% of the changes in IPO stock returns were as a result of the changes in the predictor variables. For example, 15.2% of the variation in IPO stocks returns was as a result in changes in firm board composition and firm ownership while 39% of variation was caused by other exogenous factors.

Table 6. Model summary.

No.	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.390 ^a	0.152	0.151	16.072

Note: a. Predictors: (Constant), Firm Board composition, Firm ownership.

4.3.3. Panel Regression Output

The panel regression results are presented in Table 7 whereby the effect of independent variables to the dependent variable using both CAR and BHAR are compared.

Table 7. Panel Regression Results

Dependent variables	Independent variables	Co-ef	Std. Error	T	P-value	95.0% Conf. Interval
Firm performance (CAR)	(Constant)	-65.763	4.256	-15.452	0	-74.108 -57.417
	Firm ownership	-1.927	0.971	- 1.985	0.047	-3.832 -0.022
	Firm Board composition	-18.76	4.016	- 4.671	0	-26.635 -10.884
Firm performance (BHAR)	(Constant)	-7438.198	746.564	- 9.963	0	-8902.123 -5974.273
	Firm ownership	-574.131	170.407	- 3.369	0.001	-908.281 -239.982
	Firm Board composition	-995.775	704.562	- 1.413	0.158	-2377.339 385.789

4.3.3.1. Effect of Exogenous Factors to IPO Performance

All other factors held constant, the firms will realize negative performance both under CAR and BHAR with (cons=-65.763) and (cons=-7,438.198) respectively. Hence the exogenous factors have the same effect of firm performance under CAR and BHAR with higher magnitude when BHAR is used.

4.3.3.2. Firm Ownership and IPO Stocks Performance

Firm ownership is negatively correlated with IPO stocks returns under both CAR and BHAR measuring tools. As observed earlier the effect is more when BHAR is used with (coeff=-1.927) and (coeff=-574.13) for CAR and BHAR respectively. For instance a one percent increase in shares owned by the government leads to a reduction in IPO stock returns by Kshs 1.92 and Kshs 574.10 under CAR and BHAR respectively. This finding was similar to: [Hoang and Phung \(2013\)](#) when they analyzed data from Vietnam between 2007 and 2012; [Pervan et al. \(2012\)](#) used data spanning from 2003-2010 on Croatian firms, and established that state ownership makes firm performance worse; [Musallam \(2015\)](#) compared state and foreign ownership to corporate performance and found similar results with the former reducing corporate performance. In Nigeria, [Adebiyi and Sunday \(2011\)](#) established a negative relationship between ownership structure and firm financial performance. In Kenya, the results were not different either; [Mutisya \(2015\)](#) found that ownership distribution had a negative effect on financial performance. Similar findings were made by [Mokaya and Jagongo \(2015\)](#) where ownership structure positively affected firm financial performance.

These findings contradicted the study results: [Ng'ang'a, Namusonge, and Sakwa \(2016\)](#) found that in Kenya at NSE, ownership structures especially foreign ownership and managerial shareholding positively affected the financial performance of firms; [Galal and Moustafa \(2015\)](#) established that in Egypt there was no correlation between ownership structure and firm financial performance; [AL-Najjar \(2015\)](#) found insignificant positive relationship between firm ownership and financial performance measured by ROA and ROE. This was during their evaluation of 31 companies in Palestine between 2008 and 2013.

4.3.3.3. Board Composition and IPO Stocks Performance

Similar to firm ownership, board composition has a negative effect of (coeff=-18.760) and (coeff=-995.775) on performance of IPO stocks under CAR and BHAR respectively. The BHAR as for previous independent variables has a higher magnitude than CAR. For instance, a one percentage increase in number of executive board members leads to a decrease in firm's performance by 18.7 and 995.775 under CAR and BHAR respectively. The findings are similar to: [Agarwal \(2020\)](#) who evaluated under-pricing in India and established that retained holdings of non-executive directors had significant impact on IPO subscription rate; [Wetukha \(2013\)](#) reviewed the relationship between board independent, size and duality role of the CEO and firm financial performance at NSE. The effect of independent to dependent variable was positive. [Kanakriyah \(2021\)](#) studied the characteristics of board members at Amman Stock Exchange between 2015 and 2019 and found a positive correlation between managerial ownership, board independence, gender diversity and national diversity and firm performance.

To the contrary, [Muchemwa et al. \(2016\)](#) when they tested the predictions between board structure and firm returns in South Africa they found no relationship between non-executive directors and firm returns measured by Tobin's Q and ROA; in the US, [Dolvin and Kirby \(2016\)](#) found that more external board members reduced firm's under-pricing; [Eriksen and Aberg \(2019\)](#) compared board diversity with IPO under-pricing in Sweden. The relationship between the two variables was not significant; [Ongore et al. \(2015\)](#) examined the relationship between board members and financial performance in Kenya. While there was insignificant relationship between independent board members and firm returns, gender diversity positively affected firm performance.

4.3.4. Bivariate Panel Regression

Table 8 shows the bivariate panel regression output of firm ownership, firm board composition and performance of IPO stocks using the two benchmarks of NSE and CAPM.

Table 8. Bivariate panel regression output.

Independent Variables	Benchmarks	R ²	δ	β	t-statistics	δ -sig	β -sig
Firm Board Composition	AR(NSE)	0.012	4013.569	-1324.288	-5.489	0.000	0.000
	AR(CAPM)	0.005	0.014	0.214	3.568	0.333	0.000
Firm Ownership	AR(NSE)	0.010	3665.171	312.270	5.099	0.000	0.000
	AR(CAPM)	0.008	0.073	-0.070	-4.604	0.000	0.000

Starting with board composition, this variable had statistically significant negative impact on abnormal return for NSE ($\beta=-1324.288$, $p<0.001$) and a positive significant effect on abnormal return for CAPM ($\beta=0.214$, $p<0.001$). For NSE, a unit increase in firm board composition decreases the abnormal return by 1324.288 while for CAPM a unit increase in firm board composition increased the abnormal return by 0.214. When the firm board composition is held constant, the average abnormal return for NSE was expected to be 4013.569 which was determined to be statistically significantly different from zero ($p<0.001$). The expected return for CAPM when the firm board composition is held constant was 0.014; however, this return was not significantly different with “p” value of 0.333. From the study, 1.2% and 0.5% of the variation in abnormal return for NSE and CAPM respectively could be accounted for by firm board composition.

Looking at the effect of Firm Ownership on abnormal return, the results shows that firm ownership had significant positive effect on abnormal return for NSE ($\beta=312.270$, $p<0.001$) and a negative significant effect on abnormal return for CAPM ($\beta=-0.07$, $p<0.001$). For NSE, ownership of the firm by the government increases the abnormal return by 312.270 while for CAPM the ownership of the firm by the government decreases the abnormal return by 0.07. When the firm ownership is held constant, the average abnormal return for NSE was expected to be 3665.171 which was determined to be statistically significantly different from zero ($p<0.001$). The expected return for CAPM when the firm ownership is held constant was found to be 0.073. This had a significant effect on firm returns with “p” value of 0.001. It was concluded that 1.0% of the variation in abnormal return for NSE could be accounted for by firm ownership; while for the case of CAPM 0.8% of the variation in abnormal return could be accounted for by firm ownership.

These findings were similar to [Fawaz and Osama \(2015\)](#) when they studied the relationship between long run performance of the Jordanian IPOs against benchmarks of Amman Stock Exchange, matching firms and CAPM between 1993 and 2011. They used company age, size, sector and offer size as company characteristics. It was established that firms underperformed against Amman Stock Exchange Index and CAPM.

4.3.5. Analysis of Variance

The results are presented in [Table 9](#). The F-statistic indicates that the model was stable and appropriate since significance level was below 0.05.

Table 9. Analysis of variance.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119930.559	4	29982.64	116.079	0.000
	Residual	666660.162	2581	258.295		
	Total	786590.721	2585			

4.3.6. Effect of Automation on Firm Ownership, Firm Board Composition and IPO Stocks Performance.

The null hypothesis that automation has no significant moderating effect on firm ownership, firm board composition and performance of IPO stocks at NSE is rejected and alternative hypothesis is accepted instead. This is shown in [Table 10](#). For example, automation has a positive effect on the relationship between board composition and IPO stocks performance and negative one between firm ownership and IPO stocks performance. With the “p” value being 0.443 (greater than significant level of 0.05), automation does not have a significant impact on how firm ownership and IPO performance relate. The findings are similar to [Simiyu et al. \(2014\)](#) who established that automation increased volume of companies equities traded at NSE; [Stephen et al. \(2013\)](#) concluded in their study that there was a difference in stock market returns between manual and automation during the year of transition, 2005 to 2006 at the NSE; [Attafuah \(2020\)](#) found a positive relationship between automation and market efficiency in Ghana stock market and lastly [\(Onyuma, 2020\)](#) found that at NSE post-automation stock returns were higher and more volatile than the pre-automation ones. These findings however are not in tandem with [Omuchesi et al. \(2014\)](#) who on the contrary established that the introduction of the Automatic Trading System at the NSE didn't increase market efficiency; [Mwangi \(2015\)](#) on the other hand found that the introduction of automation at NSE did not affect stock volumes.

Table 10. Moderating effect of automation.

Variable	Cof.	Std. Error	t	P-value
Firm ownership moderated	-0.807	1.052	-0.7671	0.443
Board composition moderated	13.075	3.054	4.2813	0

4.3.7. Summary of Decisions on Tested Hypotheses

These are presented in **Table 11**:

Table 11. Summary of decisions on tested hypotheses.

Hypothesis Number	Null hypothesis	P- Values	Result
H ₀₁	Firm ownership structure has no significant effect on performance of IPO stocks listed at the NSE in Kenya.	0.047.0.001	Reject the null hypothesis
H ₀₂	Firm board composition has no significant relationship on performance of IPO stocks listed at the NSE in Kenya.	0.0.158	Reject the null hypothesis
H ₀₃	Automation has no significant moderating effect on the relationship between firm ownership, firm board composition and IPO stocks performance listed at the NSE in Kenya.	0.443.0	Reject the null hypothesis
H ₀₄	Firm actual returns are not significantly different from NSE 20 share index as a benchmark.	0.001	Reject the null hypothesis
H ₀₅	Firm actual performance is not significantly different from CAPM as a benchmark.	0.001	Reject the null hypothesis

5. Summary, Conclusions and Recommendations

5.1. Summary and Conclusions of Findings

The summary of findings and conclusions is presented below as per the study objectives. These are based on secondary data collected regarding firm ownership, board composition, moderating effect of NSE automation and actual IPO stocks performance against the benchmarks. The results of analysis of these variables using parametric (t-tests, chi-square), non- parametric (Pearson correlation coefficient), multiple regressions and the analysis of variances have been presented in the preceding findings.

5.1.1. Firm Ownership and IPO Stocks Performance

The first objective of the study was to establish the effect of firm ownership structure on performance of IPO stocks at the NSE. Both descriptive and inferential statistics entailing usage of multiple regression analysis, parametric and non-parametric tests were used to analyse the secondary data and get findings. The descriptive statistics revealed the following information: 17% of the total firm shares are held by the Kenyan government. The maximum firm shares were 74% with some firms reporting a minimum share of zero percent. It was established that under both CARs and BHARs the research findings showed that firm ownership has a negative effect to firm performance. A one percent increase of shares owned by the government leads to a decline in firm’s performance by Kshs 1.92 and Kshs 574.10 under CAR and BHAR respectively.

With regard to the benchmarks, effect of firm ownership to NSE and CAPM provide mixed findings. The results show that firm ownership had significant positive effect on abnormal return for NSE and a negative significant effect on abnormal return for CAPM. The findings are consistent with most other previous research and could be as a result of the property rights theory. This makes public owners not to have incentive to aggressively pursue profit goal hence do not carefully monitor firm performance.

In conclusion therefore the null hypothesis that firm ownership structure has no significant effect on performance of IPO stocks listed at the NSE in Kenya is rejected.

5.1.2. Board Composition and IPO Stocks Performance

Second objective of the study was to find out the effect of firm board composition on performance of IPO stocks at the NSE. To complement descriptive statistics, regression analysis, parametric, non-parametric tests and analysis of variance were carried out. The following information was extracted from the descriptive statistics: On average 23% of total board members comprised the executive members. The highest percentage of executive board members to total board members was 50% while the lowest was 8%. This composition is closer to “Mwongozo” code of governance for state corporations in Kenya which requires a third of board members to be independent. The findings of the study indicated that board composition has a negative effect on IPO stocks performance. When compared to the benchmarks this result still holds true for NSE but the reverse is witnessed with CAPM since firm board composition had significant negative effect on abnormal return for NSE ($\beta=-1324.288, p<0.001$) and a positive significant effect on abnormal return for CAPM ($\beta=0.214, p<0.001$).

In conclusion the null hypothesis that firm board composition has no significant effect on performance of IPO stocks listed at the NSE in Kenya is rejected.

5.1.3. Automation of NSE and the Relationship Between Firm Ownership, Firm Board Composition and Performance of IPO Stocks at the NSE

Third objective of the study was to establish the moderating effect of automation on the relationship between firm ownership, firm board composition and performance of IPO stocks at the NSE. Descriptive and inferential statistics were applied to the secondary data so as to ascertain the study findings. Multiple linear regression was used to analyse data. The findings revealed that automation had a positive effect on the relationship between board composition and IPO performance and negative one between firm ownership and IPO performance. There was no correlation between automation, firm ownership and IPO performance.

In conclusion the null hypothesis that automation has no significant moderating effect on the firm ownership, firm board composition and performance of IPO stocks listed at the NSE in Kenya is rejected.

5.1.4. IPO Stocks Returns Compared to NSE 20 Share Index

The fourth null hypothesis was that actual performance of IPOs is not significantly different from NSE share index. When this hypothesis was tested it was found that actual performance of IPOs was significantly different from NSE share index as a benchmark whereby firm returns were higher than NSE. Therefore, firm actual performance measured by firm returns was better than NSE share index.

5.1.5. IPO Stocks Performance Compared to CAPM Benchmark

The fifth null hypothesis was that firm actual performance does not differ significantly from CAPM as a benchmark. When this hypothesis was tested it was found that firm actual performance was significantly different from CAPM as a benchmark whereby firm returns were lower than CAPM. Therefore, firm actual performance measured by firm returns was lower than CAPM benchmark.

5.2. Recommendations

The recommendations of this study in line with the study objectives are provided as below:

5.2.1. Firm Ownership

As a policy recommendation, the Kenya Government should fast track her exit from commercial activities by relinquishing the shares held in state corporations.

The Government involvement in public investments through Government Investments and Public Enterprises (GIPE) should continually diminish. For instance the Kenya Government owns 35%, 50.1%, 60% and 44.5% of Safaricom, Kenya Power, Kenya Re, and KCB bank respectively. Indeed NSE has recommended the government to reduce her shareholding in listed companies. The Privatization Commission needs to fast track this recommendation.

5.2.2. Firm Board Composition

A review of secondary data confirmed that most firms had quite few executive board members. The "Mwongozo" code of corporate governance of state corporations requires one third independent board members.

As a policy matter, the Kenya Companies Act 2015 regulations should include this requirement of fewer proportions of executive board members to all companies especially family owned companies. CEO duality role as regards board membership should also be revisited.

In order to encourage more independent board members, their allowances should be increased commensurate with the responsibility and risk exposure of decisions they make. Such a review will lead to adequate compensation and hence motivate them. These rates need to be anchored in the Company Act.

Lastly, the study recommends that liability of board members in the affairs of companies should be limited to the decisions undertaken. A situation where members are held jointly and severally liable discourages those persons willing to take up roles of independent board members.

5.2.3. Automation of NSE

Automation of NSE has amplified or increased the effect of firm board composition to the IPO firms' performance but reduced the effect of firm ownership. Therefore, this study recommends that operationally, NSE should continue to invest in improving technology since this act as a catalyst to firm performance. Thus with increased technology trading at NSE is simplified and can take place simultaneously.

5.3. Areas for Further Research

The recent trends at the NSE point toward preference of debt market to equity market specifically with bond market gaining traction. This is driven by certain and fixed returns on bonds. Research should be carried out to establish to what extent these fixed returns are affected by both micro and macro-economic factors. Further, how the securities markets can become resilient to market shocks like Covid – 19.

The study recommends further research on the relationship between firm characteristics and IPO stock returns. This could include market strategy, location, leadership or management, employees, products, foreign ownership, quality of audit reports, financial reporting and many others so as to get a broader understanding and assist diverse investors. Moderating variable could be board diversity, firm technological changes and country political leadership change.

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