The Nexus Between Firm Ownership, Board Composition and Initial Public Offering Stock Performance on the Nairobi Securities Exchange in Kenya

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Abstract

Extant literature has globally demonstrated two anomalies of initial public offering (IPO) stock performance: positive initial returns and long-run underperformance. Kenya's IPO market is experiencing a downward trend, with the last issue in 2015. The bond market has gained traction compared to the equity market. Studies have associated firm-specific factors with IPO stock performance and ignored the moderating variable of automation. This study analyzed the relationship between firm ownership, board composition and IPO stock performance on the Nairobi Securities Exchange (NSE). The percentage of shares owned by the Kenyan government was used to measure firm ownership, and board composition was measured by the percentage of executive board members to total board members. The performance of IPO stocks was measured using both cumulative abnormal returns (CARs) and buy and hold abnormal returns (BHARs). Automation was measured by IPO stock performance between the pre- and post-automation period. The sample size comprises 15 firms which floated shares between 1994 and 2019, with a total of 2,586 observations. Longitudinal and descriptive study designs were used together with a multiple linear regression to analyze the data. The Hausman test was used to choose between the fixed and random effects models. It was established that both firm ownership and board composition correlated negatively with IPO stock 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.

1. Introduction

The stock exchange market in Kenya started in the 1920s when the rules that govern stockbroking had not yet been developed (Kemboi & Tarus, 2012). Trading took place based on gentlemen's agreements where

contractual commitments were implemented by the parties, who were trusted to keep their end of the bargain and settle costs (Nyasha & Odhiambo, 2014). The first professional brokerage firm was founded in 1951 by Francis Drummond. In 1954, a group of stockbrokers voluntarily came together and were registered under the Societies Act. This was the birth of the Nairobi Securities Exchange (NSE).

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 reduced the value of shares (Aduda, Masila, & Onsongo, 2012). The NSE (2022) indicated that the securities exchange plays a critical role in growth of Kenya's economy through the 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, a wide area network (WAN) and Broker Back Office software were implemented in 2007 and 2011, respectively. In 2012, the automated market surveillance system called Capizar was launched. These series of developments transformed the Kenyan securities market to globally accepted standards. Exchange and securities investors enjoy the benefits of technology enhancement with the operationalization of electronic trading platforms (Onyuma, 2020).

Some of the automated activities of securities markets include computerized systems and electronic trading. Automated trading focuses on computer algorithms for policymaking and processing order submissions (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 market's 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 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.

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

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

A number of gaps exist in previous studies, ranging from the period covered, the number of firms, and the analytical tools used. For instance, Marc, Khurshed, and Mudambi (2006) only used a three-year period to study the relationship between the size of firms and IPO stock performance in the United Kingdom. Kinyanjui (2015) studied the performance of IPO stocks in Kenya over a period of six years. Mburugu, Nyamute, Iraya, and Mwangi (2017) used six firms to analyze the effects of IPO performance in Kenya's securities market in the long run. Gatumo (2017) regressed the raw returns against indicators of short-run IPO performance on the NSE, while Amoll (2015) used SPSS.

Globally, the performance of IPO stocks has been characterized by the anomaly of initial positive returns, which result in long-run underperformance. During a study period from 1959 to 2019, Loughran, Ritter, and Rydqvist (2020) established positive IPO returns of 3.30% in Russia, and a high of 270.10% in the United Arab Emirates. Mumtaz and Ahmed (2016) analyzed 20 studies on long-run IPO performance in over 10 countries from 1994 to 2008 and established an 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 of the CARs on the NSE was -0.49%, and Chibeka (2014) established Kenya's highest underpricing of 236% based on IPO returns 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 led to the fixed income securities surpassing the equity market.

IPO stock performance plays 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 reached 597, raising US$ 111.6 billion (Ernest and Young Global, 2021). In 2019 alone, Africa raised US$ 1.2 billion from nine 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 to the NSE, raising Ksh 13 billion (Capital Markets Authority, 2021). The

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

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

2. Literature Review

2.1. Theoretical Review

Two theories guided this paper. The first is random walk theory, which states that stock prices evolve in an unpredictable manner, resulting in a "random walk pattern". 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 depending on available information. This theory is relevant to firm ownership since the market prices cannot easily be influenced by the type of share ownership.

The second theory is the 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, so the winners actually lose. This happens when competitors have bidding strategies 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 the main cause of positive initial returns but then changes 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 firm characteristics. In some cases, it was found that the shares' returns of small companies were 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 from 1990 to 2009. They undertook an empirical analysis of the initial and post-market short-run IPO stock performances. 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 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' shareholdings had a significant effect on the 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 the performance of firms listed on the NSE, with return on equity ratio used to measure the performance of firms. The study adopted exploratory and descriptive methods to examine a total of 45 firms from 2007 to 2013. A significant positive correlation was found between board composition (measured by the number of non-executive directors) and the nationality of directors, and firm performance.

Mohammad and Faudziah (2018) undertook a study on Jordanian firms regarding the effect of firm ownership structure on firm performance using 228 firms from the 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 Omindi (2015) examined the link between ownership of shares by the government and value of firms listed on the 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%, a negative relationship was found between these two variables.

2.3. Hypothesis Development

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

2.3.1. Firm Ownership Structure and IPO Stock Performance on the NSE

The study measured firm ownership structure using the percentage of shares held by the government. Wang (2005) noted that the floating of shares through IPO resulted in a change in a firm's ownership structure with separation of managerial control and actual ownership. The proxies for IPO stock performance were cumulative abnormal returns (CARs) and buy and hold abnormal returns (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). Based on this, the following hypothesis is proposed:

H_{01}: *Firm ownership structure has no significant effect on IPO stock performance on the NSE in Kenya.*

$$\text{Firm ownership} = \frac{\text{Number of shares held by the Kenyan government}}{\text{Total shareholding}} \, x100$$

2.3.2. Board Composition and IPO Stock Performance on the NSE

The percentage of executives to total board members was used to measure the board composition of firms. Kroll, Walters, and Le (2007) measured top management team board members using the percentage of a board comprising executives involved with the business and applied the measure of corporate diversification used by Jacquemin & Berry (1979). 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 the following null hypothesis:

H_{02}: *Board composition has no significant effect on IPO stock performance on the NSE in Kenya.*

$$\text{Board composition} = \frac{\text{Executive board members}}{\text{Total board members}} \, x100$$

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

The NSE became automated in 2006. This involved the implementation of computerized and electronic trading systems. This study used Case 2 as outlined by Baron and Kenny (1986). Since automation is dichotomous, the study was divided into pre-automation and post-automation periods. A similar method of measurement was applied by Omuchesi et al. (2014), except that the study did not consider an implementation period of 54 months in their post-automation sample. The study tested the following null hypothesis:

H_{03}: *Automation has no significant effect on the relationship between firm ownership, board composition and IPO stock performance on the NSE in Kenya.*

Automation is a binary of performance of IPO, with "0" for before and "1" for after the automation of the NSE.

2.3.4. IPO Stocks' Share Prices Compared to the 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 stock performances. This is in tandem with the recommendations of Angga, H., and Jenry (2020). The following null hypothesis was tested:

H_{04}: *The performance of IPO stocks is not significantly different from the NSE 20 Share Index as a benchmark.*

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

2.3.5. IPO Stock Performance Compared to CAPM as a Benchmark

The capital asset pricing model (CAPM) was first proposed by the American economist Sharpe (1964), who describes the relationship between the expected returns of risky assets and the market or actual returns where there are risk-free assets, and the beta factor is used to obtain the equilibrium price of risky assets (Banz, 1981). The following null hypothesis was tested:

H_{05}: *The performance of IPO stocks is not significantly different from the CAPM as a benchmark.*

The CAPM is measured as follows:

$$R_{jt} = R_{f} + \beta \, (R_{m-} R_{f})$$

Where:

R_{jt} = Required rate of return of firm *j*'s stock in month *t*.

R_{f} = Risk-free rate of return represented by the interest rate on the Central Bank of Kenya's treasury bills.

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

R_m = Market return measured by the NSE 20 Share Index return.

3. Research Methodology

The methodology involves the steps taken by a researcher to achieve the research objectives. The type of the research methods are informed by what the researcher wants to determine (Kothari, 2004).

3.1. Research Design

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

3.2. Target Population, Sampling Frame and Sampling Technique

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

3.3. Data Sources and Collection Instruments

The main source of data was secondary information collected from firms' financial reports and various websites, including Capital Markets Authority, AfricanFinancials, 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 executives 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); Adebiyi and Sunday (2011); Mohammad and Faudziah (2018); Gu (2003); Mutisya (2015); Gongera and Nyamboga (2014); Mokaya and Jagongo (2015).
Automation of the NSE	Binary – Pre-automation and post-automation periods. Automation took 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 shows the specific independent variables used in the study, which are 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. Abnormal return was represented by the actual return, and the expected return was found by using the 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 relative to CAR is that no monthly rebalancing is assumed.

$$CAR = f[(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + e_1) + \beta_{0\ldots2}] \qquad (2)$$
$$CAR = f[\beta_0 + z(\beta_1 x_1 + \beta_2 x_2 + e_1) + \beta_{0\ldots2}] \qquad (3)$$
$$BHAR = f[(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + e_2) + \beta_{0\ldots2}] \qquad (4)$$
$$BHAR = f[\beta_0 + z(\beta_1 x_1 + \beta_2 x_2 + e_2) + \beta_{0\ldots2}] \qquad (5)$$

Where z = the 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.

$\beta_{0\ldots2}$ = The coefficients representing the benchmarks (Nairobi 20 Share Index and CAPM).

$e_{1\ldots2}$ = Allowance for error terms.

4. Results and Discussions

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

4.1. Descriptive Statistics

The descriptive statistics of the variables are shown 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. For firm board composition, executives made up 23.4% of the total number of board members on average. The maximum percentage of executives on the board was 50%, and the minimum was 8%. Approximately 17% of the total firm shares are held by the Kenyan government, with a maximum of 74%. Some firms reported percentages as low as zero.

Table 2. Descriptive statistics.

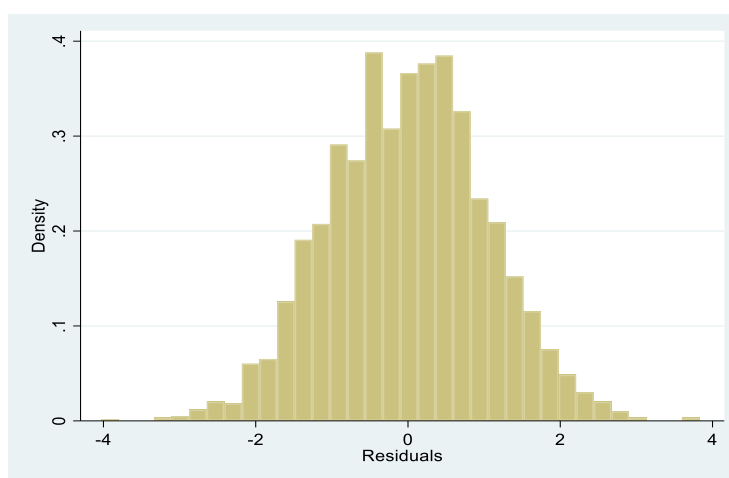| Variable	Observations	Mean	Std. dev.	Min.	Max.
Board	2,586	0.234	0.083	0.077	0.5
CAPM	2,586	0.087	0.043	-0.255	0.279
NSE	2,586	-0.001	0.054	-0.226	0.174
Actual	2,586	0.067	0.26	-0.623	1.663
AR	2,586	-0.02	0.265	-0.705	1.589
CAR	2,586	-4.421	17.434	-27.166	114.424
BHAR	2,586	357.941	2945.444	-1.119	37813.953
Ownership	2,586	0.171	0.22	0	0.739

Figure 1. Normality test under CAR and BHAR.

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

4.1.1. Normality Tests

The study carried out a normality test on the residuals of the fitted regression model for both CAR and BHAR. The IPO performance measurement methods as shown in Table 3. At the 95% confidence level, the test showed that the residuals for both BHAR and CAR models were approximately normally distributed, with p-values of 0.665, which is higher than 0.05. Therefore, the assumption of 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
Residual~CAR	2.586	0.999	0.847	-0.425	0.665
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 a p-value of 0.253, which is greater than the 0.05 confidence level. This suggests that the fixed effects regression model is different from the random effects regression. In conclusion, the random effects model is preferred over the fixed effects model.

Table 4. Comparison between fixed and random effects regressions (Hausman test).

Statistical test	Coeff.
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 to draw 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 the Two Benchmarks

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

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 show that the IPO stock performance was significantly higher than that of NSE on average (t = -13.55, p < 0.001). Comparing the IPO stock performance to that of CAPM, the study showed that the average return for the CAPM was significantly higher than that of the IPO stock performance (t = 3.9, p < 0.001). Therefore, the IPO stock performance is below the expected level in the market. These findings are closer to those found by Kinyanjui (2015) when he established that Kenya's IPO stock performance ranged close to the benchmark. However, Odipo, Olweny, and Oluoch (2020) found that the firms that issued equity underperformed in both the NSE and matching firms, and vice-versa for the CAPM as a benchmark.

4.3.2. Regression Model

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

Table 6. Model summary.

No.	R	R-squared	Adjusted R-squared	Std. error of the estimate
1	0.390[a]	0.152	0.151	16.072

Note: a denotes predictors: (Constant), firm board composition, firm ownership.

4.3.3. Panel Regression Output

The panel regression results are presented in Table 7, where the effects of the independent variables on the dependent variable using CAR and BHAR are compared.

Table 7. Panel Regression Results

Dependent variables	Independent variables	Coeff.	Std. error	T-value	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 on IPO Performance

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

4.3.3.2. Firm Ownership and IPO Stock Performance

Firm ownership is negatively correlated with IPO stock returns under both the CAR and BHAR measuring tools. As observed earlier, the effect is larger when BHAR is used, with a CAR coefficient of -1.927 and a BHAR coefficient of -574.13. For instance, a 1% increase in shares owned by the government leads to a reduction in IPO stock returns by Ksh 1.92 and Ksh 574.10 under CAR and BHAR, respectively. This finding was similar to that of 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 worsened firm performance. 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, Mutisya (2015) found that ownership distribution had a negative effect on financial performance. Similar results were obtained by Mokaya and Jagongo (2015), who found that ownership structure positively affected firm financial performance.

The following findings contradict the results of this study: Ng'ang'a, Namusonge, and Sakwa (2016) found that, on the NSE in Kenya, ownership structure, 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 an 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 on the performance of IPO stocks under CAR (coeff = -18.760) and BHAR (coeff = -995.775. The BHARs for previous independent variables have a higher magnitude than CARs. For instance, a 1% increase in the 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 underpricing in India and established that retained holdings of non-executive directors had a significant impact on the IPO subscription rate. Wetukha (2013) reviewed the relationship between board independence, size, CEO duality and firm financial performance on the NSE. The effect of the independent variable on the dependent variable was positive. Kanakriyah (2021) studied the characteristics of board members on the 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) tested the predictions between board structure and firm returns in South Africa and 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 a firm's underpricing. Eriksen and Aberg (2019) compared board diversity with IPO underpricing in Sweden and found that 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 an 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, 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 a statistically significant negative impact on the abnormal return for the NSE (β = -1324.288, p < 0.001) and a positive significant effect on the abnormal return for the CAPM (β = 0.214, p < 0.001). For the NSE, a unit increase in firm board composition decreased 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 the NSE was expected to be 4013.569, which was determined to be statistically significantly different from zero (p < 0.001). The expected return for the CAPM when the firm board composition is held constant was 0.014; however, this return was not significantly different, with a p-value of 0.333. From the study, 1.2% and 0.5% of the variation in abnormal returns for the NSE and CAPM, respectively, could be accounted for by firm board composition.

Looking at the effect of firm ownership on abnormal returns, the results show that firm ownership had a significant positive effect on the abnormal return for the NSE (β = 312.270, p < 0.001) and a negative significant effect on the abnormal return for the CAPM (β = -0.07, p < 0.001). For the NSE, ownership of the firm by the government increases the abnormal return by 312.270, while for the 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 the NSE was expected to be 3665.171, which was determined to be statistically significantly different from zero (p < 0.001). The expected return for the CAPM when the firm ownership is held constant was found to be 0.073. This had a significant effect on firm returns, with a p-value of 0.001. It was concluded that 1.0% of the variation in the abnormal return for the NSE could be accounted for by firm ownership, while in the case of the CAPM, 0.8% of the variation in the 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 the Amman Stock Exchange, matching firms and the CAPM between 1993 and 2011. They used company age, size, sector and offer size as company characteristics. It was established that firms underperformed against the Amman Stock Exchange Index and the CAPM.

4.3.5. Analysis of Variance (ANOVA)
The ANOVA results are presented in Table 9. The F-statistic indicates that the model was stable and appropriate since the 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, Board Composition and IPO Stock Performance.
The null hypothesis that automation has no significant moderating effect on firm ownership, board composition and performance of IPO stocks on the NSE is rejected and the alternative hypothesis is accepted. This is shown in Table 10. For example, automation has a positive effect on the relationship between board composition and IPO stock performance and a negative effect on the relationship between firm ownership and IPO stock performance. With a p-value of 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 the volume of companies' equities traded on the NSE. Stephen et al. (2013) concluded that there was a difference in stock market returns between manual and automated processes during the year of transition (2005 to 2006) on the NSE. Attafuah (2020) found a positive relationship between automation and market efficiency in the Ghana stock market, and Onyuma (2020) found that, on the NSE, post-automation stock returns were higher and more volatile than the pre-automation returns. These findings, however, are not in tandem with Omuchesi et al. (2014), who established that the introduction of the Automatic Trading System on the NSE didn't increase market efficiency. Mwangi (2015) on the other hand found that the introduction of automation on the NSE did not affect stock volumes.

Table 10. Moderating effect of automation.

Variable	Coeff.	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

Table 11. Summary of decisions on tested hypotheses.

Hypothesis Number	Null hypothesis	P-value	Result
H_{01}	Firm ownership structure has no significant effect on the performance of IPO stocks listed on the NSE in Kenya.	0.047.0.001	The null hypothesis is rejected
H_{02}	Firm board composition has no significant relationship on the performance of IPO stocks listed on the NSE in Kenya.	0.0.158	The null hypothesis is rejected
H_{03}	Automation has no significant moderating effect on the relationship between firm ownership, board composition and IPO stock performance listed on the NSE in Kenya.	0.443.0	The null hypothesis is rejected
H_{04}	Firms' actual returns are not significantly different from the NSE 20 Share Index as a benchmark.	0.001	The null hypothesis is rejected
H_{05}	Firms' actual performance is not significantly different from the CAPM as a benchmark.	0.001	The null hypothesis is rejected

5. Summary, Conclusions and Recommendations

5.1. Summary and Conclusions of Findings

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

5.1.1. Firm Ownership and IPO Stock Performance

The first objective of the study was to establish the effect of firm ownership structure on the performance of IPO stocks on the NSE. Both descriptive and inferential statistics entailing usage of multiple regression analysis, parametric, and non-parametric tests were used to analyze the secondary data. The descriptive statistics revealed the following information: 17% of the total firm shares are held by the Kenyan government, with a maximum of 74% and a minimum of 0%. It was established that under both CAR and BHAR, the research findings showed that firm ownership has a negative effect on firm performance. A 1% increase of shares owned by the government leads to a decline in a firm's performance by Ksh 1.92 under CAR and Ksh 574.10 under BHAR.

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

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

5.1.2. Board Composition and IPO Stock Performance

The second objective of the study was to determine the effect of a firm's board composition on the performance of IPO stocks on the NSE. To complement descriptive statistics, regression analysis, parametric and 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 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 the "Mwongozo" code of governance for state corporations in Kenya, which requires a third of board members to be independent. The findings of the study indicate that board composition has a negative effect on IPO stock performance. When compared to the benchmarks, this result still holds true for the NSE, but the reverse is witnessed with the CAPM since board composition had a

significant negative effect on abnormal return for the NSE (β = -1324.288, p < 0.001) and a positive significant effect on the abnormal return for the CAPM (β = 0.214, p < 0.001).

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

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

The third objective of the study was to establish the moderating effect of automation on the relationship between firm ownership, board composition, and the performance of IPO stocks on the NSE. Descriptive and inferential statistics were applied to the secondary data to ascertain the study findings. A multiple linear regression was used to analyze the data. The findings revealed that automation had a positive effect on the relationship between board composition and IPO performance and a negative effect on the relationship 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 firm ownership, board composition, and performance of IPO stocks listed on the NSE in Kenya is rejected.

5.1.4. IPO Stock Returns Compared to the NSE 20 Share Index

The fourth null hypothesis was that the actual performance of IPOs is not significantly different from the NSE 20 Share Index. When this hypothesis was tested, it was found that the actual performance of IPOs was significantly different from the NSE Share Index as a benchmark, whereby firm returns were higher than the NSE. Therefore, actual performance measured by firm returns was better than the NSE Share Index.

5.1.5. IPO Stock Performance Compared to the CAPM Benchmark

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

5.2. Recommendations

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

5.2.1. Firm Ownership

As a policy recommendation, the Kenyan government should fast-track its 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 Kenyan government owns 35%, 50.1%, 60% and 44.5% of Safaricom, Kenya Power, Kenya Re, and KCB Bank, respectively. The NSE has recommended that the government reduce its shareholding in listed companies. The Privatization Commission needs to fast-track this recommendation.

5.2.2. 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 of a board to comprise 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 regarding 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 provide motivation. These rates need to be anchored in the Company Act.

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

5.2.3. Automation of the NSE

Automation of the NSE has increased the effect of firm board composition on IPO firm performance but reduced the effect of firm ownership. Therefore, this study recommends that, operationally, the NSE should continue to invest in improving technology since this acts as a catalyst for firm performance. Thus, with increased technology, trading on the NSE can be simplified and can take place simultaneously.

5.3. Areas for Further Research

The recent trends on the NSE point toward a preference for debt market over the equity market, specifically with the 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, and also how the securities markets can become resilient to market shocks such as 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 to get a broader understanding by using more diverse moderating variables such as board diversity, technological changes within a firm, and country political leadership change.

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