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MOTIVATIONS FOR SEASONED EQUITY OFFERINGS AND OPERATING PERFORMANCE OF ISSUING FIRMS IN NIGERIA

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ABSTRACT. Background: Equity financing remains a critical source of corporate investment funding, yet evidence on the post-issue operating performance of seasoned equity offering (SEO) firms remains mixed, particularly in emerging markets. **Aims:** This study examined the determinants of SEO decisions and evaluated post-issue operating performance among non-financial firms in Nigeria. **Methods:** A dynamic fixed-effects logit regression was employed to analyse the determinants of SEO decisions, while post-issue operating performance was assessed using descriptive statistics and the Wilcoxon Signed-Rank Test. **Sample:** The study covered 24 non-financial firms listed on the Nigerian Exchange Group over the period 2010-2022. **Results:** Cash flow returns on assets, leverage, and price-earnings ratio exert significant negative effects on SEO decisions, whereas capital expenditure, market-to-book ratio, and interest rate exert significant positive effects. Post-issue operating performance indicators generally decline following SEOs, with a mild rebound in returns on market value of assets; however, these changes are statistically insignificant. **Conclusions:** SEO activity in Nigeria is primarily driven by financing needs, capital restructuring, and market timing considerations rather than improvements in operational efficiency. **Implications:** The findings revealed to managers, investors, and policymakers the need for disciplined capital allocation and stronger performance governance to ensure that equity financing supports long-term firm value creation.

***Keywords*:** Seasoned equity offerings; equity financing; operating performance; capital structure; market timing; Nigeria

***JEL Classification*:** G32, G14, G30, C23

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Introduction

Seasoned equity offerings are an important activity in the life of a firm; their success or otherwise may lead to value reduction or increased opportunities, since investors assume that firms' financing decisions signal their qualities (Ross, 1977). This forms the basis for appraising their values. The importance of financial resources to firms cannot be overemphasised, as they are required for the procurement of other factors of production necessary for the actualisation of an organisation's objectives. However, managers of firms are expected to exercise due diligence when confronted with the problem of making optimal financing decisions due to their intertemporal and interdependent nature (Gatchev *et al.*, 2010).

Firms issue debt and subsequently raise equity where internal earnings may not be enough, as opined by the Myers and Majluf (1984) model. However, firms may not be fully debt financed as it may not only increase their bankruptcy risk, but investors may have to be wary of firms whose shareholders have low contribution to their capital (Kraus & Litzenberger, 1973; Jensen &Meckling, 1976; Kisser and Rapushi, 2022). Therefore, investors require a certain degree of capital contribution from the existing shareholders in the form of equity to be convinced to invest in a firm. This may be due to the free cash flow hypothesis, which holds that managers may have an incentive to invest in a negative net present value (NPV) project, engage in perquisites, engage in related party transactions, or expropriation. A firm that continually issues equity may signal that the firm is financially constrained or that there is availability of investment opportunities (Kim & Weisbach, 2008).

The motivations for SEOs are those factors that precipitate firms to make the decision whether to go to the market to raise additional funds through equity or not. These factors are identified in finance literature as capital demand, liquidity, profitability, growth opportunity, leverage, asset tangibility, market timing, investor sentiment, and economic growth. The motivations may also be influenced by a unilateral factor; for example, a firm may be motivated to raise additional equity to avoid bankruptcy risk, financial distress, or an onerous restrictive debt covenant. These motivating factors can also be more than one, as a firm may raise SEO and use part of the proceeds to pay debt and the remaining part for asset acquisition or to fund expansion.

However, the stated or actual use of issue proceeds may be different from the motivations, as firms may be motivated by economic growth during a hot period, engage in financial slack, and use the funds when it becomes convenient to invest. However, the capital market is alive and does appraise firms using measures such as the intended or actual use of issue proceeds, quality of managers, corporate governance quality, information disclosure, and market sentiments (Bray & Peterson, 2009). Thus, a firm may be penalised for diverting issue proceeds from their intended purpose, as the use may help shape investors' opinions on the firm's viability, which may affect the pricing of its stock (Akerlof, 1970; Ross, 1977; Sony & Bhaduri, 2022).

Therefore, the new equity issue puzzle (Loughran & Ritter, 1995; Eckbo *et al.*, 2000; Deb, 2017) that SEO issuers underperform their non-issuing peers or their pre-issue performance measures (Loughran & Ritter, 1995; 1997; Kohonen, 2019) is still a hot topic, especially in developing markets. Although, this performance measure may partly be caused by the intended or actual use of issue proceeds (Kim & Weisbach, 2008; Bray & Peterson, 2009; Bayless & Jay, 2013) but this is attributed majorly to failure to make optimal financing choice (Durand, 1952; Akerlof, 1970; Kraus & Litzenberger, 1973, Jensen & Meckkling, 1976, Ross, 1977, Baker & Wurgler, 2002, Leary & Roberts, 2005; Yinusa *et al.*, 2017).

Firm performances can be short- or long-run in terms of their effect on the market value of firms (Hovakimian & Hu, 2016). The short-run performance measure is the announcement effect of SEOs, which can result from underpricing, discounting, or a premium, i.e., the market reaction to SEO firms. This is estimated using the event study methodology of a standard market model to estimate the impact of a new equity announcement on the short-run abnormal returns of share prices. The long-run performance of firms is in terms of the long-run stock performance and operating performance of issuers. While the former is the long-term share price, which can be estimated using buy-and-hold abnormal returns (BHAR), cumulative average abnormal returns (CAR), the Carhart four-factor model, and the Fama-French three-factor or four-factor alpha models. The latter measures equity issuers in terms of growth opportunities, profitability, asset acquisitions, number of employees, and shareholder value maximisation. This is done by either comparing the pre-issue and post-issue operating performance measures of a firm using the Wilcoxon signed-rank test (Barber & Lyon, 1996; Rafik & Azmi, 2019) or by comparing the post-issue operating measures of equity issuers with those of matched-peer non-equity issuers operating in the same

industry with similar asset values using the Wilcoxon rank-sum (Mann-Whitney) test (Loughran & Ritter, 1997; Kohonen, 2019).

The popular measures of operating performance are returns on cash adjusted assets (RCAA) proxied by operating income to book value of total assets; returns on sales (ROS) proxied by operating income to sales; returns on market value of assets (ROMVA) proxied by operating income to market value of assets; and cashflow returns on assets (CROA) proxied by operating income before depreciation plus decrease in receivables, decrease in inventory, increase in account payable increase in other current liabilities and decrease in other current assets (Barber & Lyon, 1996). Other notable measures of operating performance are earnings before depreciation and amortisation, interest, and taxes (EBITDA) to total assets; net income to total assets (ROA); net income to total revenue (profit margin); earnings before interest and taxes (EBIT) to total revenue; and EBITDA to book value of equity (Loughran & Ritter, 1997; Kohonen, 2019). Operating performance can be return on operating assets (ROOA) proxied by operating income (EBIT) to the book value of assets.

There are criticisms of the firms' underperformance. First, the underperformance of SEO issuers emanates from the inappropriate use of methodology to estimate returns of SEO firms (Fama, 1998; Prasad *et al.*, 2021). Also, the negative reaction of SEO issuers in the new equity issue puzzle is from the failure of the non-issuing firms to adjust to new risk as against SEO issuers and the misapplication of the factor model in the data analysis (Brav *et al.*,2000; Eckbo *et al.*, 2000). In addition, the size of negative reactions may be due to issue size, as large SEO issuers experience higher abnormal returns (Autore *et al.*, 2009; Virolainen, 2009). However, the degree of SEO reactions may be associated with the extent of agency conflict and the perceived adverse selection by investors. When there is high adverse selection between a firm and the market, investors may react more negatively to the issue by assuming the share to be overvalued, hence higher underpricing or discounting of firms' share prices. To resolve this, firms may engage in corporate social responsibility, which may lead to positive investor sentiment (Sun *et al.*, 2020; Li & Wang, 2022); secure the service of a star underwriter who will guarantee the issue (Ursel, 2006); or engage in information disclosure by a reputable financial analyst.

Nevertheless, equity issues provide the opportunity for firms to raise the desired funds, if possible, at relatively low costs or at the point where information asymmetry between the firm and the markets is very low (Kisser and Rapushi, 2022). In a nutshell, the decision to raise SEOs cannot be considered in isolation without examining the pre-issue and post-issue performance of SEO firms. It therefore becomes pertinent to examine motivations for SEOs among Nigerian firms and, in addition, compare the pre-issue and post-issue operating performance of SEO firms in order to make a comparison of whether SEO is beneficial. This is done by conducting fundamental analysis of SEO firms and comparing pre- and post-operating performance measures of SEO issuers using the Barber and Lyon (1996) approach. Simply put, the study broadly examines the determinants of SEO decisions of non-financial firms and the changes in their operating performance.

The study extends the model of Abraham and Harrington (2011) by including operating performance in the study of SEO. It is also similar to Chikolwa (2009), who examines determinants of SEOs of A-REITs and short-term market reaction, by examining determinants of SEOs and long-run operating performance of SEO firms. It further extends the model of Kohonen (2019) by including motivations for SEOs in the study of SEO issuers' operating performance. The study is closely related to Dbouk and Ismail (2010) who investigated motivations for SEOs and operating performance using matched-peer comparison. This study differs from that of Dbouk and Ismail (2010) by examining motivations for SEOs and the operating performance of SEO firms, comparing pre- and post-issuers' operating performance.

This paper is segmented into five sections. Section two contains the theoretical background, section three treats the methodology, section four presents the results and summary, while section five consists of the conclusion of the study.

Theoretical background

The demand for capital theory states that firms issue SEOs to invest in new projects, replace old assets, fund working capital, and cover general expenses. This is supported by Eckbo *et al.* (2007), who argue that the proceeds of SEOs are used for investment in assets of new and existing projects, to repay debt, to determine share value, to take advantage of low financing costs, to pay for mergers and acquisitions, to restructure assets, to fund working capital, and to change voting rights. The classical finance literature

argues that firms seeking business expansion or an increase in market share will be motivated to raise additional funds when internal earnings are not enough, for firms that have attained their debt capacity, or when avoiding a restrictive debt covenant.

However, a firm that has attained its debt capacity or that is constrained by bankruptcy risk may decide to raise equity, as argued in the Kraus and Litzenberger model of 1973. Firms may also raise new equity to repay debt, especially where the bankruptcy risk of the firm is high (Kisser & Rapushi, 2022). Nevertheless, Walker and Yost (2008) argue that even when debt repayment is part of the intended use of SEO proceeds, firms increase their corporate debt. Rational managers of firms are expected to balance the tax shield benefit from using debt with the bankruptcy cost of excessive use of debt (Kraus & Litzenberger, 1973; Yinusa *et al*., 2017), that is, the optimality of capital structure decision.

A firm that intends to make an SEO decision will also consider the extent of financial information available about firms in the capital market to bridge the information gap and avoid high underpricing, excessive discounting, and investor apathy (Jensen & Meckling, 1976). Firms are expected to make their SEO when the level of information asymmetry is minimal or when they have a low cost of capital. Financial analysts always follow large firms and put them in the news. These firms therefore have the advantage of making SEO decisions (Sony & Bhaduri, 2021). In addition, firms that consistently engage in corporate social responsibility will be at a greater advantage to issue equity as the level of investor sentiment towards their firms will be positively high (Sony & Bhaduri, 2021).

The market timing model argues that managers make financing decisions in the interest of the existing shareholders. This is explained in the market timing model of Baker and Wurgler (2002), in which firms target a window of opportunity by leveraging low cost of capital, positive investor sentiment, economic prosperity, low information asymmetry, and earnings management to sell overvalued shares to uninformed investors. The winner's curse hypothesis posits that uninformed investors subscribed to mispriced shares undersubscribed by informed investors.

Managers' equity issue motives may be due to agency cost when managers have the incentives to conduct SEO and keep the proceeds as financial slack, invest in negative NPV projects (value destroying hypothesis), enjoy perquisites, engage in expropriation, or related party transactions (Jensen & Meckling, 1976; Huang, 2012). The free cash flow hypothesis of Jensen (1986) also states that managers of equity issuers may lack the zeal to search for profitable projects due to a misconceived view that equity has no cost, therefore, prompting managers to display ingenuity, to search for new profitable projects, and increase shareholders' wealth. The excessive cash flow hypothesis also posits that managers may overinvest the proceeds of SEOs into projects whose returns do not commensurate with the cost (Jensen & Meckling, 1976). Agency costs of equity are negative announcement effects, underpricing, stock price decline, long-run operating or stock underperformance.

Although Myers and Majluf (1984) propose a hierarchical model of capital structure based on internal earnings, debt, and equity, it deviates from the optimal financing mix. The financing choice may be limited by excessive debt use or by firms that have already reached their debt capacity. Further analysis of the adverse selection model also shows that managers act in the interest of existing shareholders, which leads investors to view equity with suspicion and explains investors' apathy toward new equity issues. Nevertheless, Ross (1977) explores the signalling model to opine that managers use information about their firms to signal the quality of such firms to the capital markets.

This is empirically supported by the earnings management hypothesis, which posits that managers use the discretionary accrual method to deliberately manipulate pre-SEO earnings to declare unrealised positive performance and sell overvalued shares (Teoh *et al*., 1998; Lerskullawat, 2018). This view is supported by Baker and Wurgler (2002), who argue that firms deliberately time equity issues after a price run-up in order to sell shares whose price is higher than their intrinsic value. This may be as a result of a window of opportunity in the equity market when the economy is highly liquid and profitable (Leary & Robert, 2005).

A novel approach in finance is the use of a behavioural model to explain equity issuance motives. This view posits that a firm may be motivated to raise additional equity if it finds that it has positive market sentiment stemming from brand loyalty, corporate social responsibility, goodwill, regulatory compliance, and positive information disclosure (Fama, 1998; Sun *et al*., 2020).

The theoretical framework is anchored on two classical theories, namely, the demand for capital theory (Jorgenson, 1963) and the market timing theory (Baker and Wurgler, 2002). These theories collectively provide a comprehensive explanation for the motivations behind SEO decisions and their post-issue performance outcomes among Nigerian firms.

According to Jorgenson (1963), investment decisions are guided by the marginal productivity of capital relative to its cost; hence, when retained earnings decline or operating performance weakens, firms resort to external capital sources such as equity. Baker and Wurgler (2002) assert that managers exploit temporal mispricing in the equity market by issuing shares when they perceive them to be overvalued and repurchasing when undervalued. Furthermore, macroeconomic extensions of the market timing theory posit that firms take advantage of windows of opportunity within an economy to raise SEO. Post-issuance analysis focuses on operating performance across major indicators, such as ROOA, CROA, RCAA, and ROS, consistent with the demand-for-capital theory, which holds that firms raise equity for investment purposes.

Methodology

This study used secondary panel data retrieved from non-financial firms that raised SEO from 2010 to 2022 and listed on the Nigerian Exchange Limited (NGX). Names of SEO firms were extracted from the website of the Securities and Exchange Commission (SEC, 2023). The conventional SEO methods in Nigeria are public offerings and rights issues. Financial data on firm fundamentals of SEO issuers were retrieved from their annual reports from 2010 to 2022; stock market and macroeconomic data were taken from the Central Bank of Nigeria Statistical Bulletins (2023). Operating performance data were retrieved from the firm fundamentals of SEO issuers.

It used an *ex post facto* research design. The sample of the study was selected using stratified random sampling techniques to select twenty-four non-financial firms from seven sectors, such as agriculture, service, consumer goods, industrial goods, ICT, conglomerate, and real estate, for SEO motivations analysis. Ten non-financial firms were randomly selected using stratified random sampling techniques for the performance measure. The analytical framework of the study relies on Durand (1952) 's net income approach to capital structure. The method of data analysis is the maximum likelihood estimation techniques, while the parameter estimation techniques are the probit (when the error term is normally distributed) or logit models (when the error terms follow a logistic distribution), depending on the distribution of the error terms (Marsh, 1982; Kim & Song, 2020; Gao *et al.*, 2022).

To mitigate potential endogeneity, explanatory variables are introduced in lagged form, ensuring that firm characteristics are measured prior to SEO decisions. This temporal structure reduces reverse causality. In addition, macroeconomic variables such as GDP and interest rates are treated as exogenous.

The Levin-Lin-Chu (LLC) test was used to purge the data of unit roots, while descriptive statistics and correlation analyses were conducted to infer about firm fundamentals and SEO motivations. The Shapiro-Wilk test is used to test for the normality of the error terms. The Wald test is used to assess the goodness-of-fit of the models, while the variance inflation factor is used to test for multicollinearity. The pooled and panel models were selected using the Bayesian Information Criteria (BIC). The Hausman test was used to select between the fixed effect model (FEM) and the random effect model (RAM). The strength of the relationship between the motivating factors and SEO is measured using the z-statistic and pseudo-R-squared.

The nonparametric Wilcoxon signed-rank test was used to examine the effect of SEO decisions on issuers' operating performance. Operating performance of SEO issuers is measured using parametric (Chen & Liu, 2022), nonparametric (Loughran & Ritter, 1997; Kohonen, 2019), and a combination of both (Barber & Lyon, 1996) tests. Barber and Lyon (1996) argued that the nonparametric Wilcoxon signed-rank test is more powerful than the parametric t-statistic test in the study of operating performance. The nonparametric Wilcoxon signed-rank test can be unadjusted, adjusted, or a combination of both. The adjusted measures the use of industry-adjusted factors by subtracting the median peer industry level of operating performance from the issuer's level in each fiscal year (Loughran & Ritter, 1997; Kohonen, 2019).

Firms in the sample are compared to firms of the same size or with similar pre-SEO performance. That is, size-matched or performance-matched operating performance. The latter adjusts for the mean reversion in accounting data by showing a transitory component of operating income (Barber & Lyon, 1996). The unadjusted measure compares the pre-issue and post-issue operating performance of issuers as matching variables. Other studies, however, combined the adjusted and unadjusted measures (Barber & Lyon, 1996). The nonparametric Wilcoxon signed-rank test is more appropriate where data do not follow a normal distribution, including the ability to analyse ordinal data, and to reduce the impact of outliers.

Early studies examined dividend initiation, stock splits, management buyouts, SEOs, and equity repurchases (Barber & Lyon, 1996). Similar studies use operating income before depreciation (OIBD) to

assets; profit margin to sales; ROA to assets; OIBD to sales; capital expenditure plus research and development to assets; and market value to book value (Loughran & Ritter, 1997; Kohonen, 2019). This study used operating performance such as RCAA, ROS, ROMVA, and CROA (Barber & Lyon, 1996).

This approach is justified by avoiding the possibility that operating performance is obscured by special items, such as tax or accounting for minority interests. Therefore, operating income is a better measure than earnings from operating assets. Furthermore, researchers find that corporate events that may lead to changes in capital structure can affect interest expense and, consequently, profit after interest, but may not affect operating income. In addition, SEO leads to changes in the number of shares outstanding, that is, ownership dilution. Furthermore, earnings per share (EPS) represent a firm's per-share income after total expenses, including interest expense, minority interest, income taxes, and special items. This may be manipulated through the discretionary accrual method, unlike the operating performance measures of Barber and Lyon (1996). The study, therefore, applied these metrics to compare two-year pre-issue performance measures with two-year post-issue performance measures, similar to that of Brisker *et al.* (2014).

Model Specification

This study uses maximum likelihood estimation techniques to examine the probability of firms issuing SEO given a set of experimental variables. This was pioneered by Marsh (1982), who empirically examined the choice between equity and debt using both the logit and probit models.

The general equation for binary outcomes can be formulated as:

Prob (event j occurs) = Prob (Y = j) = F (relevant effects, parameters) that is

$$Prob\left(Y_{it} = \frac{1}{x_{it}}\right) = F(x_{it}\beta_{it}) = x_{it}'\beta_{it}$$

$$Prob\ (Y_{it} = \frac{0}{x_{it}}) = 1 - F(x_{it}\beta_{it})$$

Where Prob ($Y_i = 1|x_i$) is the probability of firm i conducting SEO in period t, F is a function of the model, x_{it} are firms' pre-SEO *ex ante* factors for firm i in period t, and β_{it} are the parameters to be estimated. Prob ($Y_{it} = 0|x_{it}$) is the likelihood of firm i not conducting SEO in period t. Thus, $x_{it}'\beta_{it}$ can be rewritten in a regression form as:

$$Prob\left(Y_{it} = \frac{1}{x_{it}}\right) = x_{it}'\beta_{it}$$

$$Prob\left(Y_{it} = \frac{1}{x_{it}}\right) = 1\ where\ x_{it}'\beta_{it} \to +\infty; Pro\left(Y = \frac{1}{x}\right) = 0\ where\ x\beta \to -\infty$$

The maximum likelihood estimation technique was used to investigate motivations for SEO decisions in Nigeria.

The functional model is denoted as:

$$Y_{it} = F(CROA, EPS, CSI, SGR, LTD, CAPEX, IPRO, FCPS, PER, MB, SMET, IR, GDP)$$

A probit model was adopted in the analysis, where it was inferred that the error term was normally distributed as specified below:

$$P(SEO_{it} = 1 = \Phi[\beta_0 + \beta_1 CROA_{it-1} + \beta_2 EPS_{it-1} + \beta_3 CSI_{it-1} + \beta_4 SGR_{it-1} + \beta_5 LTD_{it-1} + \beta_6 CAPEX_{it-1} + \beta_7 IPRO_{it-1} + \beta_8 FCPS_{it-1} + \beta_9 PER_{it-1} + \beta_{10} MB_{it-1} + \beta_{11} SMET_{it-1} + \beta_{12} IR_{it-1} + \beta_{13} GDP_{it-1} + \varepsilon_{it}$$

A logit model was employed in the data analysis, where it was assumed that the error term follows a logistic distribution as stated below:

$$P(SEO_{it} = 1 = \Lambda[\beta_0 + \beta_1 CROA_{it-1} + \beta_2 EPS_{it-1} + \beta_3 CSI_{it-1} + \beta_4 SGR_{it-1} + \beta_5 LTD_{it-1} + \beta_6 CAPEX_{it-1} + \beta_7 IPRO_{it-1} + \beta_8 FCPS_{it-1} + \beta_9 PER_{it-1} + \beta_{10} MB_{it-1} + \beta_{11} SMET_{it-1} + \beta_{12} IR_{it-1} + \beta_{13} GDP_{it-1} + \varepsilon_{it}$$

Where: CROA is cashflow returns on asset to proxy for operating performance, EPS is earnings per share for profitability; CSI is cash and short-term investment for liquidity; SGR is sales growth rate for growth opportunities; LTD is long-term debt for leverage; CAPEX is capital expenditure to proxy for

demand for capital; IPRO is issue proceeds for offer size; FCPS is floatation cost per share to proxy for floatation cost; PER is price earnings ratio for market timing; MB is market-to-book ratio for market timing; SMET: stock market equity traded to proxy for stock market liquidity; IR is interest rate to proxy for interest rate; and GDP is gross domestic product for economic growth. The number of firms is denoted by i, t represents the period, and -1 indicates that the models are dynamic by being lagged.

Table 1. Measurement of Variables

S/N	Parameter Measured	Variable	Symbol	Measurement of Variables	Justifications
1	Probability of SEO	SEO	P (SEO =1,0)	This is a dummy variable that equals one when SEO is conducted, or zero otherwise.	Hovakimian and Hu (2020) show that when the beta of any variable is greater than zero, the variable influences SEO decision-making.
2	Operating Performance	Cashflow returns on assets	CROA	Operating income before depreciation plus the decrease in receivables, the decrease in inventory, the increase in accounts payable, the increase in other current liabilities, and the decrease in other current assets, scaled by the beginning and ending period book value of total assets.	Firms may be driven by return on asset value to raise SEOs. Barber and Lyon (1996) used this variable as a proxy for the operating performance measure of SEO issuers.
3	Profitability	Earnings per share	EPS	Ratio of net profit to total assets	Sony and Bhaduri (2021) find a negative relation between profitability and SEO decision.
4	Liquidity	Cash and short-term investment	CSI	Cash and bank balance plus other short-term investments divided by total assets	Abraham and Harrington (2011) argue that firms with low liquidity and high debt interest will have a higher inclination for SEO
5	Growth Opportunity	Sales growth rate	SGR	Ratio of Current period sales less previous period sales to previous period sales	Gao *et al.* (2022) argue that this variable increases SEO probability.
6	Leverage	Long-term debt to book value of assets	LTD	Ratio of long-term debt to book value of assets	Frank and Goyal (2009) and Li and Wang (2022) argue that this variable may be a sign of financial distress and has a positive relation with SEO
7	Demand for capital	Capital Expenditure	CAPEX	Ratio of capital expenditure to total assets	Sony and Bhaduri (2021) show that this has a positive relation with SEO
8	Offer Size	Issue proceeds	IPR	ratio of issue size to market size of equity (firms' market capitalisation)	There is a negative relation between SEO and issue proceeds (Virolainen, 2009); a positive relation between SEO and issue proceeds (Lorenz, 2020; Li & Wang, 2022).
9	Floatation Cost	Floatation cost per share	FCPS	Ratio of total floatation cost to total number of shares.	Firms followed by analysts have positive investor sentiment and may raise SEO (Li & Wang, 2022).

10	Market timing	1) Price earnings ratio 2) Market-to-book ratio	PER MB	Share price divided by earnings per share Stock price multiplied by the number of shares divided by the book value of equity.	This ratio measures market timing (Gibilaro & Mattarocci, 2018; Hanselaar *et al.*, 2019; Lorenz, 2020). This ratio is positively related to equity issuance (Huang *et al.*, 2016; Kisser & Rapushi, 2022).
11	Stock Market Liquidity	Stock market equity traded	SMET	Equity traded on the stock markets divided by stock market capitalisation.	There is a positive relation between stock market liquidity and the probability of SEO (Ginglinger *et al.*, 2013; Hanselaar *et al.*, 2019).
12	Economic Growth	Gross domestic product	GDP	Gross domestic product growth rate (new GDP less previous GDP divided by previous GDP)	Bolarinwa and Adegboye (2020). There is a negative relation between SEO and GDP growth (Virolainen, 2009)
13	Interest Rate	Interest Rate	IR	Changes in interest rate (New interest rate minus previous interest rate divided by previous interest rate)	This is new in the study of SEO. Garba (2014) examined its effect on common stock. Yinusa *et al.* (2017) examined its effect on leverage. This measures the effect of lending rate on SEO (Gao & Zhu, 2015)

Source*: Own processing based on reviewed literature*

Results

Descriptive Results of SEOs and Fundamental Analysis of Firms

Table 2 presents a summary of fundamental analysis across non-financial firms in Nigeria, including the mean, standard deviation, coefficient of variation, minimum, maximum, skewness, kurtosis, and number of observations. The mean value of SEO for non-financial firms is 0.1158, suggesting that only a few of these firms engage in SEO issuance on the average. The standard deviation is 0.3199, signifying variation around the mean. The coefficient of variation is high at 2.7625. The minimum of 0 and the maximum of 1 indicate that at some points SEO was not, while at other points it was issued. The skewness of 2.4077 indicates a right-skewed distribution, while the kurtosis of 6.7971 indicates a moderately high leptokurtic distribution.

The mean value of CROA is 0.1040 with a standard deviation of 0.2419 and a coefficient of variation of 2.3259, implying a moderate deviation. The minimum of -0.5503 and the maximum of 1.1467 represent the lowest and highest values of CROA, respectively. The skewness and kurtosis of 2.1578 and 9.4995 indicate a right-skewed and a moderate leptokurtic distribution, respectively. The mean value of EPS is 7.8577, with a standard deviation of 69.5643 and a coefficient of variation of 8.8530, indicating a high degree of variability. The minimum and maximum values of -240 and 1,076 represent the lowest and the highest EPS values, respectively. The skewness and kurtosis of 12.2439 and 183.5701 indicate a right-skewed and high-tailed leptokurtic distribution, respectively.

The mean value of CSI is 0.1024 with a standard deviation of 0.1395 and a coefficient of variation of 1.3623, showing a very low deviation. The minimum and maximum of 0.0001 and 0.8942 represent the lowest and the highest CSI, respectively. The skewness and kurtosis of 2.3898 and 9.4325 imply a right-skewed and moderately tailed leptokurtic distribution. The mean value of SGR is 0.2417 with a standard deviation of 0.8058 and a coefficient of variation of 3.338, representing a moderate deviation from the mean value. The minimum and maximum value are -0.9244 and 6.1610, represent the lowest and the highest SGR, respectively. The skewness and kurtosis of 4.2306 and 25.7352 imply a right-skewed and high-tailed leptokurtic distribution.

The mean value of LTD is 0.1126 with a standard deviation of 0.2394 and a coefficient of 2.1261, representing a moderate deviation from the mean value. The minimum and maximum of 0 and 2.4621 show the lowest and highest ratios of LTD. The skewness and kurtosis of 6.5303 and 58.3357 signify a right-

skewed and high-tailed leptokurtic distribution, respectively. The mean of CAPEX is -0.0316 with a standard deviation of 1.2099 and a coefficient of -38.2759, implying a very high deviation from the mean value. The minimum and maximum of -19.6135 and 6.3319 show the lowest and highest CAPEX ratios. The skewness and kurtosis of -13.1642 and 223.9170 show a left-skewed and high-tailed leptokurtic distribution.

The mean of IPRO is 0.7950, with a standard deviation of 2.1520 and a coefficient of 2.7069, indicating a moderate deviation from the mean. The minimum and maximum of 0.0053 and 28.0073 represent the lowest and the highest ratios of IPRO. The skewness and kurtosis of 9.0717 and 101.4361 imply a positively skewed, highly leptokurtic distribution. The mean of FCPS is 0.4868 with a standard deviation of 1.7990, and a coefficient of 3.6955 shows that FCPS deviates from the mean value. The minimum and maximum values of 0.001 and 10.7365 reveal the lowest and the highest FCPS. The skewness and Kurtosis of 5.0027 and 26.9852 represent a rightly skewed and moderately peaked leptokurtic distribution.

The mean value of PER is 47.2256 with a standard deviation of 256.6638 and a coefficient of variation of 5.4348, implying a low deviation from the mean value. The minimum and maximum of -1,229 and 2,317 show the lowest and highest PER, respectively. The skewness and kurtosis of 5.4125 and 47.5427 represent a right-skewed and moderately peaked leptokurtic distribution, respectively. The mean of MB is 3.3838, with a standard deviation of 9.4106 and a coefficient of 2.7810, indicating a mild deviation from the mean. The minimum and maximum of 0.2616 and 100.8711 represent the lowest and the highest value of MB, respectively. The skewness and kurtosis of 51.8208 show a right-skewed and mildly peaked leptokurtic distribution.

The mean of SMET is 0.0870 with a standard deviation of 0.0354 and a coefficient of variation of 0.4068, signifying that the variable SMET does not deviate from the mean value. The minimum and maximum of 0.0411 and 0.1777 represent the lowest and the highest SMET value. The skewness and kurtosis of 0.8977 and 3.8990 show a right-skewed and flat-peaked leptokurtic distribution. The mean value of IR is 0.1075 with a standard deviation of 0.2787 and a coefficient of variation of 2.5925, implying a mild deviation of IR from the mean value. The minimum and maximum of -0.1538 and 0.9200 signify the lowest and the maximum value of IR, respectively. The skewness and kurtosis of 1.8916 and 5.8629 signify that there is a right-skewed and leptokurtic distribution.

The mean value of GDP is 0.0301 with a standard deviation of 0.0265 and a coefficient of variation of 0.8803, signifying that GDP does not deviate from the mean value. The minimum and maximum GDP of -0.0161 and 0.0837 imply the lowest and highest value of GDP, while the negative value shows a decline in GDP in some years. The skewness and kurtosis of 0.1449 and 2.5824 a positively skewed platykurtic distribution.

Table 2.Descriptive Analysis of Seasoned Equity Offering

Tests	Mean	Standard Deviation	COV	Minimum	Maximum	Skewness	Kurtosis
SEO	0.1158	0.3199	2.7625	0	1	2.4077	6.7971
CROA	0.1040	0.2419	2.3259	-0.5503	1.1467	2.1578	9.4995
EPS	7.8577	69.5643	8.8530	-240	1076.4	12.2439	183.5701
CSI	0.1024	0.1395	1.3623	0.0001	0.8942	2.3898	9.4325
SGR	0.2417	0.8058	3.3338	-0.9244	6.1610	4.2306	25.7352
LTD	0.1126	0.2394	2.1261	0	2.4621	6.5303	58.3357
CAPEX	-0.0316	1.2099	-38.27	-19.6135	6.3319	-13.1642	223.917
IPRO	0.7950	2.1520	2.7069	0.0053	28.0073	9.0717	101.4361
FCPS	0.4868	1.7990	3.6955	0.001	10.7365	5.0027	26.9852
PER	47.2256	256.66	5.4348	-1,229.64	2,317.708	5.4125	47.5427
MB	3.3838	9.4106	2.7810	0.2616	100.8711	6.4098	51.8208
SMET	0.0870	0.0354	0.4068	0.0411	0.1777	0.8977	3.8990
IR	0.1075	0.2787	2.5925	-0.1538	0.9200	1.8916	5.8629
GDP	0.0301	0.0265	0.8803	-0.0161	0.0837	0.1449	2.5824

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Correlation Analysis

The correlation between SEO and capital expenditure is positive and statistically significant (r = 0.324, p < 0.01), indicating that firms with higher levels of investment are more likely to issue equity. This suggests that equity issuance is strongly linked to financing investment needs, supporting the view that firms raise external equity to fund growth opportunities and capital expansion. Similarly, the relationship between SEO and interest rate is negative and statistically significant (r = -0.151, p < 0.01), implying that higher interest rates are associated with a lower likelihood of equity issuance. This may reflect the broader macroeconomic environment, where tighter monetary conditions reduce overall financing activity or signal unfavourable market conditions for issuing equity. In addition, the correlation between SEO and issue proceed is negative and statistically significant (r = -0.125, p < 0.05), suggesting that firms with lower capital requirement are more inclined to issue equity. This finding indicates that less profitable firms may rely more on external equity financing, possibly due to insufficient internal funds, aligning with financing constraints and pecking order considerations.

Variables that exhibit a positive but statistically insignificant relationship with SEO include earnings per share and market-to-book ratio. Although these variables show a direct association with equity issuance, the lack of statistical significance suggests that their influence is weak and not reliably different from zero. Variables such as cash flow, return on assets, cash and short-term investment, sales growth rate, long-term debt, floatation cost per share, price-earnings ratio, stock market equity traded, and gross domestic product demonstrate negative but statistically insignificant relationships with SEO. While the negative direction may suggest a tendency for these factors to be associated with lower equity issuance, the absence of statistical significance indicates that these relationships are not strong enough to draw meaningful conclusions.

Table 3. Correlation Analysis of SEO Firms

		SEO	CROA	EPS	CSI	SGR	LTD	CAPEX	IPRO	FCPS
SEO	CC	1.000								
	S(2-T)									
	N	312								
CROA	CC	-.092	1.000							
	S(2-T)	.107								
	N	312	312							
EPS	CC	.026	.237**	1.000						
	S(2-T)	.654	.000							
	N	312	312	312						
CSI	CC	-.050	.081	.278**	1.000					
	S(2-T)	.375	.154	.000						
	N	312	312	312	312	312				
SGR	CC	-.030	.105	.206**	.121*	1.000				
	S(2-T)	.595	.065	.000	.032					
	N	312	312	312	312	312				
LTD	CC	-.038	.034	.101	-.148**	.065	1.000			
	S(2-T)	.505	.549	.075	.009	.251				
	N	312	312	312	312	312	312			
CAPEX	CC	.324**	.117*	.448**	.217**	.209**	-.035	1.000		
	S(2-T)	.000	.039	.000	.000	.000	.535			
	N	312	312	312	312	312	312	312		
IPRO	CC	-.125*	-.122*	-.294**	-.232**	-.099	.075	-.192**	1.000	
	S(2-T)	.027	.031	.000	.000	.080	.189	.001		
	N	312	312	312	312	312	312	312	312	
FCPS	CC	-.034	.022	.342**	.079	-.012	.162**	.041	.302**	1.000

	S(2-T)	.545	.695	.000	.164	.826	.004	.476	.000	
	N	312	312	312	312	312	312	312	312	312
PER	CC	-.043	.164**	.423**	.307**	.165**	-.112*	.263**	-.206**	.006
	S(2-T)	.446	.004	.000	.000	.003	.047	.000	.000	.922
	N	312	312	312	312	312	312	312	312	312
MB	CC	.001	.019	.081	.221**	.111*	-.101	-.003	-.376**	.099
	S(2-T)	.991	.734	.154	.000	.049	.074	.957	.000	.082
	N	312	312	312	312	312	312	312	312	312
SMET	CC	-.013	.061	.101	-.061	.009	-.020	.037	-.074	.110
	S(2-T)	.814	.287	.076	.280	.874	.721	.513	.193	.052
	N	312	312	312	312	312	312	312	312	312
IR	CC	-.151**	.092	.056	-.017	.162**	.066	.056	-.052	.060
	S(2-T)	.008	.106	.324	.758	.004	.246	.327	.362	.293
	N	312	312	312	312	312	312	312	312	312
GDP	CC	-.031	.117*	.147**	-.053	.067	.035	.102	-.079	.108
	S(2-T)	.588	.039	.010	.350	.237	.540	.073	.165	.056
	N	312	312	312	312	312	312	312	312	312
		PER	MB	SMET	IR	GDP				
PER	CC	1.000								
	S(2-T)									
	N	312								
MB	CC	.215**	1.000							
	S(2-T)	.000								
	N	312	312							
SMET	CC	.117*	.147**	1.000						
	S(2-T)	.039	.009							
	N	312	312	312						
IR	CC	.044	.115*	.295**	1.000					
	S(2-T)	.441	.043	.000						
	N	312	312	312	312					
GDP	CC	.116*	.166**	.535**	.328**	1.000				
	S(2-T)	.041	.003	.000	.000					
	N	312	312	312	312	312				

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Pre-Estimation Test

This study used financial data of fundamental analysis factors, sourced from non-financial firms that conducted SEOs. These data being volatile in nature necessitated the use of the Levin-Lin-Chu test (LLC) to test for the presence of a unit root, given specific conditions regarding homogeneity and stationarity. The choice of the LLC was due to the use of maximum likelihood estimation techniques of probit and logit models as applied by Le *et al.* (2020). Table 4 shows that all the variables are stationary at level I (0).

Table 4. Levin-Lin-Chu Unit Root Test

Variables	Level			Order of Integration
	Unadjusted t	Adjusted t*	P-Value	
SEO	-13.0839	-6.5048	0.0000	I (0)
CROA	-13.9906	-6.2166	0.0000	I (0)
EPS	-9.5513	-3.8128	0.0001	I (0)
CSI	-21.5437	-13.0284	0.0060	I (0)
SGR	-16.7253	-10.4972	0.0000	I (0)
LTD	-64.8947	-67.0834	0.0001	I (0)
CAPEX	-12.3856	-4.9112	0.0000	I (0)
IPRO	-12.7480	-8.2910	0.0000	I (0)
FCPS	-9.1849	-5.6948	0.0000	I (0)
PER	-10.9737	-3.4282	0.0003	I (0)
MB	-13.6051	-10.0772	0.0000	I (0)
SMET	-7.9770	-2.2928	0.0109	I (0)
IR	-22.1331	-14.4297	0.0000	I (0)
GDP	-11.1670	-5.3887	0.0000	I (0)

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Regression Results of SEO Decisions in Nigeria

Parameter Estimation Selection Criteria

Tables 5 and 6 show the model selection criteria for the study. The Shapiro-Wilk test was used to test the normality of the error terms. The Shapiro-Wilk test is significant at 1 per cent for each variable, as shown in Table 5. The mean Shapiro-Wilk test across the analysis is also significant at the 1 per cent level (coefficient = 0.7846; probability = 0.000), indicating that the model residuals are not normally distributed; hence, the adoption of logit models over probit models as being appropriate for the study. The results of the multicollinearity diagnostic test indicate that all the explanatory variables have VIF values below 1.55, while the highest tolerance value (1/VIF) is 0.9797. Since all VIF values are well below the conventional threshold of 10 and even the more conservative benchmark of 5, this suggests the absence of multicollinearity.

Table 5. Shapiro-Wilk Test and Variance Inflation Factors

Statistics	Shapiro-Wilk Test		Variance Inflation Factor	
Variables	W	Probability	VIF	I/VIF
SEO	0.9552	0.000		
CROA	0.7691	0.000	1.02	0.9797
EPS	0.1478	0.000	1.08	0.9259
CSI	0.6901	0.000	1.03	0.9703
SGR	0.5747	0.000	1.17	0.8540
LTD	0.4909	0.000	1.07	0.9302
CAPEX	01680	0.000	1.49	0.6723
IPRO	0.2757	0.000	1.04	0.9631
FCPS	0.2531	0.000	1.09	0.9204
PER	0.3263	0.000	1.05	0.9488
MB	0.2813	0.000	1.54	0.6476
SMET	0.9006	0.000	1.36	0.7351
IR	0.7431’	0.000	1.07	0.9307
GDP	0.9797	0.000	1.36	0.7355
Mean	0.7846	0.000	1.18	

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

The linktest in Table 6 shows that the model is well specified. The predicted value (_hat) is statistically significant (β = 1.0815; probability = 0.000), while the squared predicted value (_hatsq) is not significant (β = 0.0233; probability = 0.528), indicating no evidence of model misspecification.

Table 6.Linktest Result

Description	Coefficient	Z	Probability
_hat	1.0815	3.70	0.000
_hatsq	0.0233	0.63	0.528
Constant	0.0570	0.12	0.907

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Pooled and Panel Models Selection Criteria

The pooled models were tested for heteroscedasticity using the Wald test, and when the test was passed, that is, the models were found to be homoscedastic, the results were compared with the panel models using the BIC. Where the pooled models failed the Wald test (heteroscedasticity), the Hausman test was used to select between the FEM and the REM, while assuming the pooled model to be unreliable. Hence, the FEM and REM were assumed to account for entity-specific heterogeneity and, therefore, are considered to be more appropriate.

Table 8 shows the BIC used in selecting between the pooled and the panel models as estimated from Table 7, which contains the Wald test and the Hausman test. The models with the lowest BIC were selected after testing the Wald test on the pooled models to ensure their goodness of fit. The choice of using the BIC to select between the pooled and the panel models is due to the emphasis of the BIC on parsimony and the theoretical coherence that aligns to explain the underlying principle of equity issuance decision (Frank & Goyal, 2009).

The Wald test for the model failed to be significant at both 1 per cent and five per cent (coefficient = 16.95; probability = 0.2016). The panel model was considered using the Hausman test to select between the FEM and the REM. However, the result of the Hausman test is not reliable due to its non-positive state. The fixed effect model is therefore selected for the study because it has the lowest BIC of 184.5532. In addition to the dynamic panel model, this approach also helps to mitigate endogeneity concerns, as the use of a fixed effects panel model controls for unobserved firm-specific heterogeneity by accounting for time-variant characteristics across firms.

Table 7. Wald Test

Statistical Test	Coefficient	Probability
Wald Test	16.95	0.2016
Hausman test	18.21	0.1498

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Table 8. Bayesian Information Criteria for Selecting Between the Pooled and Panel Models

Financial		
Pooled	Fixed	Random
275.2303	184.5532	280.9733

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Fixed Effect Model, Odds Ratio, and Marginal Effect of Seasoned Equity Offering Decision in Nigeria

The FEM reveals that the proxy for operating performance (CROA) is negatively significant at the 1 per cent level (coefficient = -4.6135; probability = 0.008). The odds ratio is 0.4642 (probability = 0.395), suggesting that a unit increase in CROA decreases the odds of a firm issuing SEO by approximately 53.58 per cent (1 - 0.4642), although not significant. The marginal effects (coefficient = −0.0704; probability = 0.396) further imply that a unit increase in CROA reduces the likelihood of equity issuance by 7.04 per cent, holding other factors constant; this fails to be significant as well.

The FEM reveals that the proxy for leverage (LTD) is negatively significant at the 5 per cent level (coefficient = -6.6770; probability = 0.022). The odds ratio is 0.1577 (probability = 0.304), indicating that a unit increase in leverage decreases the odds of a firm issuing equity by 84.23 per cent (1 - 0.1577), although not significant. The marginal effects (coefficient = -0.1694; probability = 0.304) suggest that a unit increase in leverage reduces the probability of equity issuance by 16.94 per cent, which is not significant as well. The FEM reveals that the proxy for capital demand (CAPEX) is positively significant at the 1 per cent level (coefficient = 3.5758; probability = 0.000). The odds ratio is positively significant at the 5 per cent level (coefficient = 3.3412; probability = 0.034), which means that a unit increase in capital expenditure raises the odds of issuing SEO by approximately 234.12 per cent (3.3412 - 1). The marginal effect is positively significant at the 5 per cent level (coefficient = 0.1107; probability = 0.032), indicating that a unit increase in CAPEX increases the likelihood of an SEO by 11.07 per cent, holding other factors constant.

The FEM reveals that the proxy for market timing (PER) is negatively significant at the 5 per cent level (coefficient = -0.0087; probability = 0.021). The odds ratio is positively significant at the 5 per cent level (coefficient = 0.9930; probability = 0.014), indicating that a unit increase in PER reduces the odds of equity issuance by 0.70 per cent (1 - 0.9930). The marginal effect is negatively significant at the 5 per cent level (coefficient = -0.0006; probability = 0.013), implying that a unit increase in PER decreases the probability of SEOs by 0.06 per cent while holding other fundamental analysis variables constant.

The FEM shows that another proxy for market timing (MB) is positively significant at the 1 per cent level (coefficient = 0.4936; probability = 0.009). The odds ratio is positively significant at the 5 per cent level (coefficient = 0.8886; probability = 0.042), implying that a unit increase in market-to-book ratio raises the odds of an SEO by approximately 11.14 per cent (1 - 0.8886). The marginal effect is positively significant at the 5 per cent level (coefficient = -0.0108; probability = 0.041), suggesting that a unit increase in MB increases the likelihood of an SEO by 1.08 per cent, holding other factors constant.

The FEM reveals that the proxy for interest rate (IR) is negatively significant at the 5 per cent level (coefficient = -2.8614; probability = 0.038). The odds ratio is positively significant at the 5 per cent level (coefficient = 0.0568; probability = 0.028), indicating that a unit increase in interest rate reduces the odds of equity issuance by 94.32 per cent (1 - 0.0568). The marginal effect is negatively significant at the 5 per cent level (coefficient = -0.2631; probability = 0.030), showing that a unit increase in interest rate lowers the probability of an SEO by 26.31 per cent, while holding other variables constant. The constant term (coefficient = -2.0106; probability = 0.000) is negatively significant at the 1 per cent level, with an odds ratio of 0.1339, indicating that, in the absence of the explanatory variables, the base likelihood of issuing SEO is relatively low.

The model's overall fit is satisfactory, with a Pseudo R^2 of 0.1270, indicating that about 12.7 per cent of the variation in SEO decision is explained by the model. The likelihood ratio statistic (LR = 52.50; probability = 0.0000) confirms the joint significance of the explanatory variables, supporting the robustness of the model.

Figure 1 presents the average marginal effects of fundamental analysis of firms and the likelihood of SEO decisions, with 95% confidence intervals. The figure shows how a unit change in each explanatory variable influences the probability of a firm issuing equity, holding other factors constant. The marginal effects of CROA are negative, suggesting that weaker operating performance pushes firms toward external financing. The marginal effects of LTD are negative and economically significant, suggesting that firms issue equity to reduce excessive debt burdens and restore target capital structures.

The positive, statistically significant marginal effect of CAPEX indicates that firms issue equity to finance new investment projects when internal funds are insufficient. The magnitude of the marginal effect implies that investment activity is a primary driver of equity financing decisions. The marginal effects of PER and MB are significant, suggesting that firms issue equity when market sentiment favours higher valuations. The negative marginal effect of IR indicates that higher borrowing costs motivate firms to issue equity rather than debt.

Table 9. Fixed Effect Logit Model, Odds Ratio and Marginal Effects of SEO Decision

	Fixed Effect Logit Model			Odd Ratio Estimate			Marginal Effects		
Variables	Coef.	z	P>z	Coef.	z	P>z	Coef.	z	P>z
CROA	-4.6135*	-2.7	0.008	0.4642	-0.9	0.395	-0.070	-0.85	0.396
EPS	-0.0005	-0.1	0.885	0.9987	-0.5	0.648	-0.0001	-0.5	0.648
CSI	2.7129	1.6	0.105	1.4859	0.32	0.747	0.0363	0.32	0.747
SGR	0.0654	0.2	0.837	1.1064	0.33	0.739	0.0092	0.33	0.739
LTD	-6.677**	-2.3	0.022	0.1577	-1.0	0.304	-0.1694	-1.0	0.304
CAPEX	3.5758*	3.7	0.000	3.3412**	2.12	0.034	0.1107**	2.15	0.032
IPRO	-0.1057	-0.7	0.460	0.9415	-0.4	0.660	-0.0055	-0.4	0.660
FCPS	0.2852	0.5	0.621	1.0002	0.00	0.998	0.0002	0.00	0.998
PER	-0.01**	-2.3	0.021	0.9930**	-2.5	0.014	-0.001**	-2.5	0.013
MB	0.4936*	2.6	0.009	0.8886**	-2.0	0.042	-0.011**	-2.1	0.041
SMET	4.7598	0.71	0.475	884.8454	1.2	0.228	0.6227	1.2	0.227
IR	-2.861**	-2.1	0.038	0.0568**	-2.2	0.028	-0.263**	-2.2	0.030
GDP	-14.7594	-1.4	0.162	0.1161	-0.2	0.803	-0.197	-0.3	0.803
Constant	-2.0106*	-3.8	0.000	0.1339*	-3.8	0.000			
Pseudo R^2	0.1270			0.1270					
LR	52.50			28.33					
Log Likelihood	-54.9470			-97.4141					
Probability	0.0000			0.0081					

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

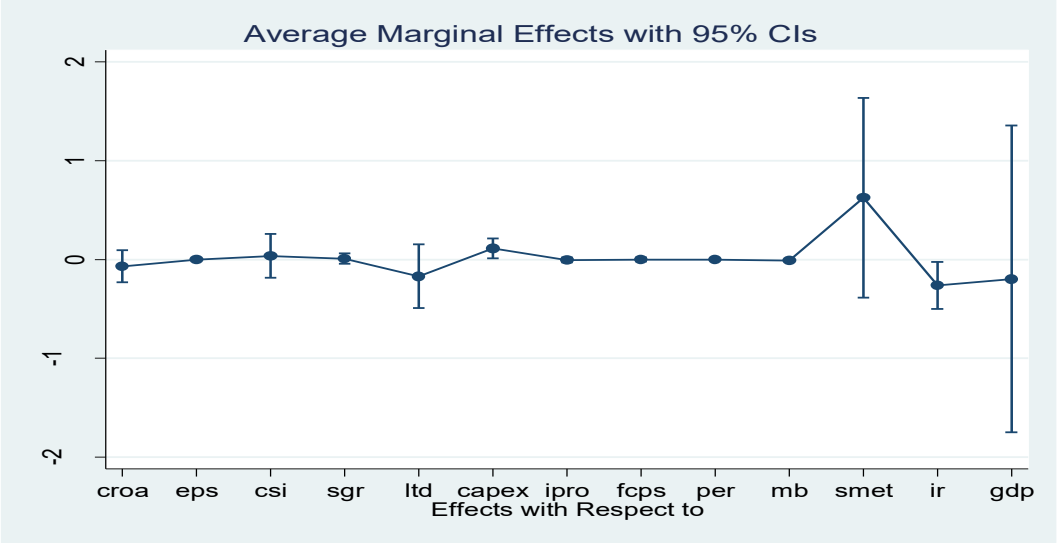

Figure 1. Marginal effect of fundamental analysis factors and SEO decisions
Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Estimating the Predicted Probability of SEO Decision when Some Fundamental Analysis Factors are given Predicted Values

The predicted probability represents the odds of a binary dependent variable taking the value of 1, that is, the probability of an event occurring given the predetermined value of an independent variable. The purpose is to predict the likelihood of an SEO if a variable that is considered important in the equity issue decision is allocated a specific value.

Table 10 reveals that the probability of an SEO is 11.60 per cent (coefficient = 0.1160; probability = 0.001) when the predicted variables, such as the proxy for operating assets (CROA), proxies for market timing (price earnings ratio; market-to-book), and interest rate, are given 0.20 each.

Table 10. Predicted Probability of SEOs when Selected Fundamental Analysis Factors are Pre-Determined

Description	Margin	Z	P>z
coefficient	0.1160*	3.38	0.001
Predicted variable	ROOA = 0.20; MB = 0.20		
	PER = 0.20; IR = 0.20		

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Estimating the Predicted Probability of SEO Decision when Fundamental Analysis Factors are Set To their Mean Values

Table 11 shows that the predicted probability of an SEO is significant at 1 per cent (coefficient = 0.0551; probability = 0.003), implying that there is a 5.51 per cent likelihood of an SEO when fundamental analysis factors are set to their mean values.

Table 11. Predicted Probability of SEOS when Firm Characteristics are Set to their Mean Values

Variables	Mean Value
Cashflow return on assets	0.1040
Earnings per Share	7.8577
Cash & Short-term Investment	0.1024
Sales Growth Rate	0.2417
Long-term Debt	0.1126
Capital Expenditure	-0.0316
Issue Proceeds	0.7950
Floatation Cost	0.4868
Price Earnings Ratio	47.2256
Market-to-book ratio	3.3838
Stock Market Equity Traded	0.0870
Interest rate	0.1075
Gross Domestic Product	0.0301
Coefficient	0.0551*
Z	2.99
Probability	0.003

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Operating Performance of SEO firms

Descriptive Analysis of Operating Performance

Table 12 presents the mean and median values of five operating performance measures, namely ROOA, CROA, RCAA, ROS, and ROMVA, for firms that raised SEOs. The analyses compare these performance measures across three periods, namely pre-issue, issue year (zero), and post-issue phases, to evaluate how operating efficiency evolves around the equity issuance event. The mean values indicate a general decline in operating performance after the SEO, suggesting that firms experience diminishing returns following equity issuance. Specifically, ROOA falls from 0.1671 in the pre-issue period to 0.0775 post-issue, showing a consistent drop in profitability derived from operating assets. A similar downward pattern is observed for CROA (from 0.0658 pre-issue to 0.0328 post-issue) and RCAA (from 0.1757 to 0.0847), implying a decline in cash-based performance measures after the SEO. These results indicate that firms tend to issue equity during periods of relatively strong performance but subsequently exhibit weaker

operating outcomes, consistent with Loughran and Ritter (1997); Kohonen (2019). The ROS shows the steepest decline, with the mean dropping from 0.7494 before issuance to 0.1450 after issuance. This suggests that post-issue firms may experience significant cost inefficiencies or lower sales profitability, possibly due to overinvestment or agency-related inefficiencies following the influx of new capital.

In contrast, ROMVA exhibits a mild rebound from 0.0985 to 0.1431 post-issue, suggesting that market-based valuation measures may recover even when accounting profitability declines. This could reflect market optimism or asset revaluation following the issuance, aligning with the notion that market indicators respond more dynamically to new information than traditional accounting measures. The median values also reflect similar trends, reinforcing that the observed decline is not driven by outliers but represents a general pattern among the sampled firms. Median CROA and RCAA values rise slightly in the issue year but decline post-issue, implying short-term cash performance improvements possibly due to proceeds from the equity offer, followed by normalisation or underperformance in subsequent periods.

Table 12.Operating Performance of SEO Firms

Variable	Mean			Median		
	Pre	Zero	Post	Pre	Zero	Post
ROOA	0.1671	0.0911	0.0775	-0.0307	0.0890	0.0673
CROA	0.0658	0.0263	0.0328	-0.2229	0.0652	0.0639
RCAA	0.1757	0.0977	0.0847	-0.0347	0.0961	0.0707
ROS	0.7494	0.3982	0.1450	-0.3861	0.1445	0.1235
ROMVA	0.1370	0.0985	0.1431	-0.0322	0.0642	0.0530

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Median Operating Performance of SEO Firms Using Pre and Post Issue Analysis

Table 13 presents a descriptive summary of the median, mean, skewness, and kurtosis values of operating performance, namely, ROOA, CROA, RCAA, ROS, and ROMVA for firms that undertook SEOs over two years before (-2, -1), the year of issue (0), and two years after (+1, +2). The analysis captures the evolution of firms' operating performance to determine whether equity issuance coincides with improvement or deterioration in firm fundamentals. The results reveal a performance cycle around the SEO event, characterised by pre-issue improvement, a peak at the issue year, and a subsequent decline in operating outcomes. Specifically, means of ROOA and RCAA increase from 0.0891 and 0.0936 in year -2 to 0.0911 and 0.0977 in the issue year (0), indicating relatively strong operating efficiency before issuance. However, both measures decline in the post-issue years, with ROOA dropping to 0.0775 and RCAA to 0.0847 by year +1, suggesting post-issue operating underperformance. Similarly, CROA, a cash-based measure of operating performance, exhibits a rise from 0.0530 in year -2 to 0.0652 in the issue year but falls thereafter to 0.0328 in year +1, implying that cash flow efficiency weakens following equity issuance.

In contrast, ROS reveals considerable volatility. The mean value increases from 0.3275 in year -2 to 0.3982 at issuance, but declines sharply to 0.1450 in year +1 and further to -0.2851 by year +2. The large negative median ROS post-issuance suggests that sales profitability deteriorates substantially after SEOs, potentially due to overinvestment, rising costs, or declining revenue efficiency following capital inflows. This observation supports the agency cost of free cash flow hypothesis. Meanwhile, ROMVA fluctuates moderately, rising to 0.0985 in the issue year but turning negative in later periods (-0.1303 by year +2). This pattern implies that market-based valuations initially respond positively to the issuance, possibly due to investor optimism, but later decline in actual post-issue performance. The skewness and kurtosis statistics indicate non-normal distribution across most of the variables, particularly for ROS and ROMVA, which show high kurtosis (7.70 and 7.87, respectively). This suggests that performance outcomes vary widely across firms, consistent with heterogeneous post-issue experiences documented in prior literature (Loughran & Ritter, 1997; Kohonen, 2019).

Table 13. Median Operating Performance of SEO Pre and Post Issue Performance

Fiscal Year	Parameter	ROOA	CROA	RCAA	ROS	ROMVA	Aggregate
+2	Mean	0.0673	0.0460	0.0681	-0.285	-0.1303	-0.0468
	75%	0.0898	0.1003	0.0979	0.2108	0.0606	0.11188
	Median	0.0671	0.0931	0.0733	0.1136	0.0358	0.07658
	25%	0.0441	-0.0473	0.0468	0.0386	-0.0429	0.00786
	Skewness	0.1912	-0.2907	-0.062	-2.523	-2.5933	-1.05548
	Kurtosis	2.7465	2.3921	2.6104	7.7006	7.8783	4.66558
+1	Mean	0.0775	0.0328	0.0847	0.1450	0.1431	0.09662
	75%	0.0924	0.1211	0.1261	0.2297	0.0703	0.12792
	Median	0.0673	0.0639	0.0707	0.1235	0.0530	0.07568
	25%	0.0423	-0.0027	0.0486	0.0450	0.0305	0.03274
	Skewness	1.2324	-1.6443	0.8548	0.1301	2.6307	0.64074
	Kurtosis	4.5187	5.0728	3.6165	4.7173	8.0011	5.18528
0	Mean	0.0911	0.0263	0.0977	0.3982	0.0985	0.14236
	75%	0.1045	0.1182	0.1123	0.3307	0.0779	0.14872
	Median	0.0890	0.0652	0.0961	0.1445	0.0642	0.0918
	25%	0.0649	-0.005	0.0661	0.0771	0.0452	0.0496
	Skewness	0.9768	-1.4271	0.7322	1.5679	2.3935	0.84866
	Kurtosis	4.8393	4.4343	4.6828	4.0362	7.3646	5.07144
-1	Mean	0.0780	0.0127	0.0821	0.4219	0.0596	0.13086
	75%	0.1459	0.0693	0.1477	0.5611	0.1064	0.20608
	Median	0.0433	0.0245	0.0480	0.2150	0.0318	0.07252
	25%	0.0254	-0.0102	0.0270	0.1058	0.0217	0.03394
	Skewness	0.4560	-1.0855	0.4078	1.6908	0.6091	0.41564
	Kurtosis	1.4061	3.5391	1.3595	5.0269	1.7128	2.60888
-2	Mean	0.0891	0.0530	0.0936	0.3275	0.0773	0.1281
	75%	0.1462	0.1383	0.1501	0.4268	0.1048	0.19324
	Median	0.0870	0.0826	0.0914	0.1352	0.0726	0.09376
	25%	0.0539	0.0051	0.0588	0.0809	0.0378	0.0473
	Skewness	-0.378	-1.3520	-0.522	1.3166	0.8783	-0.0115
	Kurtosis	3.2656	4.0735	3.3873	4.8147	4.4979	4.0078

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Table 14 presents the Wilcoxon Signed-Rank test results comparing the pre- and post-issue operating performance of firms undertaking SEOs. The test evaluates whether there are statistically significant differences in firm performance before and after the equity issue, using five performance indicators, namely ROOA, CROA, RCAA, ROS, and ROMVA. The Wilcoxon Signed-Rank test result for ROOA (z = -0.764; probability = 0.4446), CROA (z = 0.459; probability = 0.6465), RCAA (z = -0.561; probability = 0.5751), ROS (z = -1.070; probability = 0.2845), and ROMVA (z = -1.376; probability = 0.1688) reveal no significant differences in median performance at conventional levels of statistical significance (1%, 5%, or 10%). The corresponding probability values exceed the 0.05 threshold, confirming that changes in performance measures after the SEO are statistically insignificant. This implies that the firms' operating performance metrics remained relatively stable following equity issuance. Although some indicators, such as ROOA, RCAA, and ROS, show negative z-values suggesting a mild post-issue decline in operating performance, the differences are not strong enough to establish statistical significance. Conversely, the slight positive z-value of CROA indicates a marginal but statistically insignificant improvement in cashflow-based performance after the issue.

Table 14. Z-Statistics Testing Pre and Post Issue Operating Performance Measures Using the Wilcoxon Signed-Rank Test

Fiscal Year	Parameter	ROOA	CROA	RCAA	ROS	ROMVA	Average Median	Average Mean
Pre and Post Issue	Z	-0.764	0.459	-0.561	-1.07	-1.376	-0.764	-0.6624
	Probability	0.4446	0.6465	0.5751	0.2845	0.1688		

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Table 15 presents the Wilcoxon Signed-Rank test results comparing firms' yearly pre- and post-issue operating performance measures surrounding SEOs. The test examines whether there are statistically significant changes in operating performance within both one-year and two-year windows surrounding the equity issuance. The two-year pre- and post-issue results reveal that the Wilcoxon Signed-Rank test results for ROOA (z = 0.459; probability = 0.6465), CROA (z = -0.764; probability = 0.4446), RCAA (z = 0.459; probability = 0.6465), ROS (z = 1.784; probability = 0.0745), and ROMVA (z = 1.172; probability = 0.2411) are not statistically significant at the 5 per cent level. However, ROS, with a probability value of 0.0745, is marginally significant at the 10 per cent level, suggesting a weak indication of improvement in sales performance relative to operating revenue over the two-year post-issue period. The other measures exhibit no significant variation, implying that SEOs did not substantially alter firms' underlying operating performance over the term.

Similarly, the one-year pre- and post-issue comparison shows z-statistics of 0.764 (probability = 0.4446) for ROOA, 0.357 (probability = 0.7213) for CROA, 0.459 (probability = 0.6465) for RCAA, 0.561 (probability = 0.5751) for ROS, and 0.459 (probability = 0.6465) for ROMVA, all of which are statistically insignificant. These findings suggest that short-term post-issue performance remains largely unchanged, indicating that the benefits of equity issuance may not change immediately after the offer.

Table 15. Z-Statistics Testing Yearly Pre and Post Issue Operating Performance Measures Using the Wilcoxon Signed-Rank Test

Fiscal Year	Parameter	ROOA	CROA	RCAA	ROS	ROMVA	Average Median	Average Mean
Two-Year Pre and Post Issue	Z	0.459	-0.764	0.459	1.784	1.172	0.459	0.622
	probability	0.6465	0.4446	0.6465	0.074	0.2411		
One Year Pre and Post Issue	Z	0.764	0.357	0.459	0.561	0.459	0.459	0.52
	probability	0.4446	0.7213	0.6465	0.575	0.6465		

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

The Sign Test serves as a nonparametric robustness check to validate the results of the Wilcoxon Signed-Rank test, thereby confirming the consistency and reliability of observed changes in operating performance before and after SEOs. Table 16 presents the results of the Sign Test for operating performance indicators such as ROOA, CROA, RCAA, ROS, and ROMVA over the pre- and post-issue periods. For the one-sided test, the results show that ROOA (positive = 5; negative = 5; p = 0.6230), CROA (positive = 6; negative = 4; p = 0.3770), RCAA (positive = 5; negative = 5; p = 0.6230), ROS (positive = 2; negative = 8; p = 0.0547), and ROMVA (positive = 4; negative = 6; p = 0.3770) are all statistically insignificant at the 5 per cent level. Only ROS, with a probability value of 0.0547, shows weak significance at the 10 per cent level, suggesting a marginal tendency for firms' sales-based profitability to decline following equity issuance. This indicates that, although firms experience some shifts in operational activities post-SEO, these do not translate into consistent performance improvements across the indicators.

The two-sided test further reinforces this conclusion, with minimum probabilities of 1.0000, 0.7539, 1.0000, 0.1094, and 0.7539 for ROOA, CROA, RCAA, ROS, and ROMVA, respectively, none of which reach the 5 per cent significance threshold. This outcome implies that the median differences

between pre- and post-SEO operating performance remain statistically indistinguishable, confirming that SEOs exert no systematic effect on firms' operational efficiency or profitability.

Table 16.Sign Test of Pre and Post Issue Operating Performance of SEO Firms

Fiscal Year	Parameter	ROOA	CROA	RCAA	ROS	ROMVA
One-Sided test	Positive	5	6	5	2	4
	Binomial	0.6230	0.3770	0.6230	0.9893	0.8281
	Negative	5	4	5	8	6
	Binomial	0.6230	0.8281	0.6230	0.0547	0.3770
Two-sided test	Minimum probability	1.0000	0.7539	1.0000	0.1094	0.7539

Source: *Own processing using Stata 14 based on SEO issuers' Annual Report data*

Conclusion

The main objective of this study is to examine the motivations for SEO decisions and the operating performance of SEO firms in Nigeria. This section examines the fundamental analysis motivating SEOs. The error term of the model follows a logistic distribution; hence, logit regression was used by the FEM (panel logit regression). The result shows that operating performance has a significantly negative effect on SEO decisions, a positive odds ratio, and a negative marginal effect, implying that firms with lower operating performance will raise SEOs. This finding is new in the study of motivations for SEO decisions; however, Jung *et al.* (1996) find no relation between SEO and cash flow. This aligns with the demand for capital theory (Jorgenson, 1963), as firms with low operating performance are more inclined to issue equity to meet their capital needs or sustain investments when internal cash flows are insufficient.

Leverage has a significantly negative influence on SEO decisions, with a positive odds ratio and a negative marginal effect, implying that firms with low leverage are motivated to raise SEOs, consistent with the findings of Gibilaro and Mattarocci (2018). This aligns with the pecking order theory of Myers and Majluf (1984) that firms seeking additional funds use internal earnings first, then debt, and subsequently equity as a last resort. However, Dittmar *et al.* (2020) and Evans *et al.* (2024) find a positive and significant relationship between leverage and SEO, while Nnadi *et al.* (2021) failed to find a significant relationship. Capital demand has a positive and significant relation with SEO decision, positive significant odds ratio, and positive significant marginal effect, implying that firms seeking additional investable funds have a higher propensity for SEOs, consistent with the finding of Chikolwa (2009), in contrast with Billet *et al.* (2019), who find a negative relation.

Market timing (price-earnings ratio) has a negative, significant effect on SEO decisions, a positive, significant odds ratio, and negative, significant marginal effects, indicating that firms sell overvalued shares at a discount, consistent with the findings of Gibilaro and Mattarocci (2018) and Lorenz (2020). This aligns with market timing theory. The proxy for market timing (market-to-book ratio) has a positive and significant influence on SEO decisions, a positive and significant odds ratio, and a negative and significant marginal effect, implying that managers of firms time equity markets to sell overvalued shares. This is consistent with the finding of Hovakimian and Hu (2016). The interest rate has a significant negative impact on the SEO decision, a positive significant odds ratio, and a negative significant marginal effect, implying that a lower interest rate leads to a higher equity issue decision. This may be caused by the activities of bondholders in diverting their funds from lower interest-yielding bonds onto equity capital as interest rates decrease, consistent with Gibilaro and Mattarocci (2018).

The analysis of operating performance of firms conducting SEOs reveals a general pattern of post-issue decline in operating performance across the performance measures, namely, ROOA, CROA, RCAA, ROS, and ROMVA. Firms typically exhibit stronger performance before issuance and weaker performance thereafter. This pattern supports the argument that firms tend to issue equity during periods of high performance and subsequently experience deterioration once the capital has been raised.

The descriptive analysis indicates that mean and median values of ROOA, CROA, RCAA, and ROS all decline following SEOs, suggesting that operating performance measures weaken post-issue. This aligns with Loughran and Ritter (1997) and Kohonen (2019), who find that firms experience declining operating outcomes after equity issuance. The sharp decline in ROS further implies increased cost inefficiencies or

reduced sales profitability after the infusion of new capital, consistent with agency-related inefficiencies and the free cash flow hypothesis. In contrast, ROMVA shows a mild rebound post-issue, suggesting that market-based valuation may initially respond positively to the equity issue, possibly reflecting market optimism or revaluation effects even when accounting-based measures decline. The median-based time-series analysis reinforces these findings, revealing a cyclical performance pattern: improvement before issuance, a peak at the issue year, and deterioration afterwards. This cyclical behaviour suggests that SEOs are often timed to coincide with periods of relatively strong performance, in line with the market timing hypothesis of Baker and Wurgler (2002) and the demand for capital theory (Jorgenson, 1963), which posits that firms issue equity when internal liquidity becomes insufficient to sustain investment growth.

The nonparametric Wilcoxon Signed-Rank Test and Sign Test results confirm that changes in post-issue operating performance are statistically insignificant across all measures, suggesting that SEOs do not lead to substantial or systematic improvements or deterioration in firm fundamentals. While a marginal decline in ROS is observed at the 10 percent significance level, the lack of consistent significance across other indicators suggests that SEOs neither enhance nor deteriorate firm performance in a statistically meaningful way. This finding corroborates prior evidence by Deb (2017) and Andrikopoulos *et al*. (2017), who report limited post-issue operational gains and attribute SEOs primarily to capital structure adjustments rather than immediate performance enhancement.

The Nigerian evidence aligns with and deviates from findings in European and other developed markets. Consistent with prior studies in developed economies, the results confirm the importance of market timing and capital demand motives, as evidenced by the significant effects of price-earnings ratio, market-to-book ratio, and capital expenditure on SEO decisions. This supports the market-timing hypothesis of Baker and Wurgler (2002) and aligns with the empirical findings of Gibilaro and Mattarocci (2018) and Lorenz (2020), suggesting that firms exploit favourable market valuations when issuing equity. Similarly, the positive role of capital expenditure is consistent with the demand for capital theory (Jorgenson, 1963) and with empirical evidence by Chikolwa (2009), which indicates that firms issue equity to finance investment opportunities.

However, notable deviations emerge when compared with evidence from developed markets. First, the significant negative relationship between operating performance and SEO decisions contrasts with Jung et al.'s (1996) findings, which report no significant relationship in developed markets. This suggests that, unlike firms in developed economies, Nigerian firms with weaker operating performance are more likely to issue equity, possibly due to stronger financing constraints and limited access to alternative funding sources. Second, the negative relationship between leverage and SEO decisions, although consistent with the pecking order theory of Myers and Majluf (1984), deviates from some developed-market evidence, where highly leveraged firms issue equity to rebalance capital structures (Dittmar *et al*., 2020; Evans *et al*., 2024). This divergence may reflect structural differences in debt market development and borrowing conditions in Nigeria, as also suggested by the mixed findings of Nnadi *et al*. (2021).

Furthermore, the significant influence of interest rates on SEO decisions highlights the sensitivity of Nigerian firms to macroeconomic conditions, consistent with Gibilaro and Mattarocci (2018), but more pronounced than typically observed in developed markets with deeper and more stable financial systems. In addition, the observed post-issue position in operating performance aligns with international evidence by Loughran and Ritter (1997), Kohonen (2019), Deb (2017), and Andrikopoulos *et al*. (2017), confirming that SEO firms generally do not experience sustained improvements in operating performance following equity issuance. The findings provide robust evidence that SEO decisions in Nigeria are primarily driven by financing needs, capital restructuring motives, and market timing considerations. Specifically, firms with weaker operating performance and lower leverage are more likely to issue equity, supporting the demand for capital and the pecking order theories. In addition, the significant role of market-based indicators such as price-earnings and market-to-book ratios reinforces the relevance of the market timing hypothesis. The analysis of post-issue operating performance reveals a consistent pattern of pre-issue strength followed by post-issue decline, although the changes are not statistically significant across most performance measures. This suggests that SEOs do not translate into sustained improvements in firm fundamentals, thereby supporting prior international evidence that equity issuance is often associated with stagnant or deteriorating long-term operating performance.

Importantly, the study demonstrates that while Nigerian evidence aligns with developed-market findings in terms of market timing and capital-demand motivations, it also exhibits notable deviations, particularly in the significant negative relationship between operating performance and SEO decisions and the inverse relationship between leverage and equity issuance. These differences are likely driven by

institutional characteristics of emerging markets, including higher information asymmetry, constrained access to debt financing, and relatively underdeveloped capital markets.

The study contributes to the international SEO literature by providing specific evidence from Nigeria, highlighting that the determinants and consequences of equity issuance are not entirely universal but are shaped by underlying market structures and economic conditions. The findings underscore the need for policymakers and market participants to strengthen financial market development, improve access to alternative financing sources, and enhance corporate governance frameworks to ensure that equity financing translates into meaningful firm performance outcomes. This study is subject to the limitation of being constrained by a relatively small sample size of 24 firms, as only these firms met the data requirements at the time of the study. Future research can address this limitation by expanding the sample to include a larger number of firms, preferably exceeding 30.

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