From Shareholders to Markets: The Impact of Ownership Structure on IPO Performance in North Africa

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Article

From Shareholders to Markets: The Impact of Ownership Structure on IPO Performance in North Africa

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Abstract

This research explores the impact of ownership structure on the financial performance of Initial Public Offerings (IPOs) in North African markets, a key emerging region that remains insufficiently examined in the academic literature. Drawing on agency theory (Jensen & Meckling, 1976), signalling theory (Leland & Pyle, 1977; Rock, 1986), and liquidity theory (Amihud & Mendelson, 1986), the study investigates how different shareholder configurations; particularly managerial shareholding, ownership concentration, institutional investor presence, and float; influence both initial underpricing and long-run market performance. Based on a sample of 228 IPO transactions conducted between 2005 and 2023 across six countries (Morocco, Egypt, Tunisia, Algeria, Libya, and Mauritania), the research adopts a quantitative methodology grounded in a hypothetico-deductive approach. The findings support the signalling theory premise that managerial retention constitutes a credible quality signal, showing a strong positive relationship between post-IPO managerial shareholding (MOWN) and long-run performance measured by the 36-month Buy-and-Hold Abnormal Return (BHAR). Ownership concentration (CONC) reduces underpricing while improving long-term performance, reflecting stronger governance discipline. Institutional investor presence (INST) exerts a significant moderating role on both performance dimensions. Conversely, firm size shows no direct significant effect, a result consistent with the institutional specificities of North African markets. These findings underscore the complex mechanisms behind IPO success in this context and offer practical and theoretical implications regarding governance practices and institutional frameworks. The study also outlines avenues for future research, including a deeper examination of regional governance dynamics.

Keywords: initial public offerings; ownership structure; financial performance; underpricing; BHAR; corporate governance; signalling theory; agency theory; emerging markets; North Africa

1. Introduction

The agency problem associated with information asymmetries (Jensen & Meckling, 1976) remains a persistent challenge for emerging financial markets. During an Initial Public Offering (IPO), these asymmetries between insiders; founding shareholders and managers; and outside investors constitute one of the main sources of value distortion. These distortions first manifest as initial underpricing, the phenomenon whereby the offer price is systematically set below the market equilibrium price, generating an abnormal positive return on the first day of trading (Rock, 1986; Ritter, 1991). They also translate, over the longer term, into investor disappointment for those who

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subscribed at the offer price, with risk-adjusted returns below the market over 36-month horizons (Loughran & Ritter, 1995; Aggarwal & Rivoli, 1990). These two empirical anomalies, which are robust and documented across many geographic contexts, continue to pose substantial theoretical and practical challenges.

Building upon this theoretical foundation, the ownership structure at the time of listing represents a fundamental governance mechanism. By defining the distribution of control rights between founders, managers, institutional investors, and the public, the ownership structure at IPO directly shapes the quality of information conveyed to the market and the governance incentives that will prevail in the post-listing period. Jensen (1986) highlights that concentrated ownership disciplines managers by limiting their discretion over free cash flows, while Leland and Pyle (1977) demonstrate that managerial share retention acts as a credible quality signal that reduces adverse selection costs for uninformed investors. Understanding how these ownership configurations influence IPO outcomes is therefore central to both corporate finance theory and investment practice.

The North Africa region represents a unique and compelling context for studying IPO dynamics due to several factors. Its stock exchanges; the Casablanca Stock Exchange, the Bourse des Valeurs Mobilières de Tunis (BVMT), the Egyptian Exchange (EGX), and the Algiers Stock Exchange; are undergoing significant transformations, characterized by structural reforms, progressive economic diversification, and varying levels of institutional development. These differences create gaps in market maturity, institutional quality, and investor protection, which directly impact the nature and success of IPO transactions. The dominant ownership structures in the region, characterized by strong family and state concentration (La Porta et al., 1999), differ fundamentally from those observed in developed markets and may influence underpricing mechanisms in a distinct manner. This heterogeneity and the transitional stage of these financial markets make North Africa an interesting environment to analyse how such disparities influence IPO performance and strategy.

Despite the region's growing strategic importance, empirical studies analysing IPO transactions within North Africa are scarce, partly due to data limitations. However, recent improvements in data availability now enable rigorous quantitative analysis. Addressing this research gap is crucial to understanding how ownership structures, particularly managerial equity retention combined with institutional monitoring, impact post-IPO financial performance in emerging markets. This study aims to fill this gap by empirically examining 228 IPO transactions conducted in the region between 2005 and 2023. Adopting a hypothetico-deductive approach, the research assesses how ownership concentration, managerial equity stakes, institutional investor presence, and float influence key performance indicators: initial underpricing and 36-month Buy-and-Hold Abnormal Returns (BHAR). The study contributes novel insights by contextualising IPO mechanisms within North Africa's unique institutional setting, thereby extending the theoretical and practical understanding of value creation in primary market transactions.

The paper is organised as follows: first, the theoretical framework and hypotheses are presented; second, the research methodology and data sources are detailed; finally, empirical results are analysed, followed by a discussion of managerial and academic implications and suggestions for future research.

2. Literature Review

Initial Public Offerings have attracted increasing academic interest since the foundational work of Ibbotson (1975) and Ritter (1984, 1991). Two empirically robust phenomena dominate this literature: short-term underpricing and long-run underperformance. In parallel, the role of ownership structure in determining these phenomena has progressively emerged as a distinct research field. In this literature review, we provide a synthesis of the studies conducted across three distinct waves of IPO research, analysing their evolution and impact.

- Early Research on IPOs (1975–2000)

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The study of Initial Public Offerings gained traction in the 1970s, driven by the persistent empirical observation of a systematic anomaly on primary markets. Ibbotson (1975) was the first to rigorously document underpricing as a recurring phenomenon in the United States, opening the way for an abundant literature. Rock (1986) proposed the first comprehensive theoretical model based on information asymmetry: he distinguishes between informed and uninformed investors and demonstrates that issuers must offer a discount to attract the latter, thereby avoiding the winner's curse. This foundational model remains one of the most cited explanations of underpricing in developed markets. Under Rock's framework, the optimal underpricing level is determined by the need to compensate uninformed investors for the risk of receiving allocations primarily in overpriced issues, a problem that arises precisely because informed investors selectively withdraw from offerings they perceive as overvalued.

Ritter (1984) documented the existence of so-called 'hot issue market' periods, during which underpricing levels are abnormally high, suggesting that market conditions play a crucial role. In 1991, Ritter significantly enriched the literature by documenting the long-run underperformance of US IPOs over a three-year horizon, challenging Fama's (1970) market efficiency hypothesis. This double anomaly; short-term gain followed by long-run loss; was interpreted by Ritter and Welch (2002) as reflecting opportunistic behaviour by issuers who exploit temporary market overvaluation windows. Signalling theory constitutes the other foundational theoretical pillar. Leland and Pyle (1977) proposed a model in which managerial share retention post-IPO constitutes a credible signal of the firm's intrinsic quality. This signal is credible precisely because it exposes founders to undiversified portfolio risk: a low-quality firm cannot imitate this signal without incurring a prohibitive cost. Allen and Faulhaber (1989) and Welch (1989) extended this framework by modelling underpricing itself as a deliberate quality signal, allowing the best firms to 'leave money on the table' in order to signal their superiority and prepare for more favourable subsequent equity offerings.

The trade-off theory of capital structure (Modigliani & Miller, 1963) and agency theory (Jensen & Meckling, 1976) together provide a complementary framework for understanding the role of the pre-IPO ownership structure in shaping these dynamics. Jensen and Meckling demonstrate that when managers hold equity stakes, the agency costs of equity are reduced because managerial interests are more closely aligned with those of outside shareholders. This alignment effect is particularly relevant at IPO, when the transition from private to public ownership creates new agency conflicts between retaining founders and incoming public shareholders. Fama and Jensen (1983) further establish that the separation of ownership and control in diffuse-ownership firms creates the classical principal-agent problem that permeates IPO markets. In summary, early studies like Ibbotson (1975), Rock (1986), and Ritter (1991) established underpricing and long-run underperformance as robust stylised facts and laid the theoretical foundations on which subsequent research was built.

- Private Equity and IPO Performance Insights (2000–2015)

Building on earlier findings, research from 2000 to 2015 focused on extending the analysis of IPO determinants to emerging markets and deepening the understanding of governance mechanisms. Ritter and Welch (2002) proposed a comprehensive synthesis of underpricing theories and concluded that information asymmetry remains the best empirical explanation, although irrational investor behaviour (investor sentiment) gained explanatory importance in the context of speculative bubbles. Ljungqvist and Wilhelm (2003) demonstrated that changes in pre-IPO ownership structure during the technology bubble significantly altered underpricing levels, confirming the direct link between ownership configuration and IPO pricing. Their findings showed that as insider ownership stakes fell and institutional investor allocations grew during this period, underpricing increased substantially, consistent with a weakening of the signalling mechanism.

On emerging markets, Omran (2005) studied privatisation IPOs in Egypt and showed that ownership concentration is an essential determinant of post-IPO performance, in line with agency theory. Agathee, Sannassee, and Brooks (2012) confirmed on African markets that underpricing is significantly higher than in developed markets, reflecting more pronounced information

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asymmetries and structurally lower liquidity. Mlonzi, Kruger, and Nthoesane (2011) found average underpricing levels of 28.6% on Sub-Saharan markets, compared to 15–20% in developed markets. These findings converge on the conclusion that the institutional environment of the issuing country conditions both the magnitude and determinants of IPO anomalies. Shleifer and Vishny (1997) demonstrated that governance quality conditions the efficient use of raised funds and the protection of minority shareholders, two factors directly linked to post-IPO performance. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1999) showed that concentrated ownership is the norm in countries with weak investor legal protection; a characteristic shared by North African countries; and that this concentration can have ambivalent effects on firm value, reducing agency costs while potentially enabling minority shareholder expropriation.

Jain and Kini (1994), in a landmark study of 682 US IPOs, documented a systematic deterioration of post-IPO operating performance, which they attribute to reduced managerial discipline after the dispersion of capital at the time of the offering. Mikkelson, Partch, and Shah (1997) extended this result by documenting that post-IPO managerial retention is positively correlated with long-term operating performance, empirically validating Leland and Pyle's (1977) signalling model. Gompers and Metrick (2001) documented the disciplinary role of institutional investors in the governance of listed firms, while Benveniste and Spindt (1989) established the theoretical foundations of the bookbuilding process, showing that institutional investors who provide information during the bookbuilding phase receive preferential allocations in exchange, a mechanism that improves price discovery and reduces underpricing when institutional monitoring capacity is high. These findings from the 2000–2015 period reinforced the understanding of the role of ownership structure in IPO performance and opened the way for specific studies on emerging markets.

- Recent Developments in IPO Research (2017–2024)

Recent studies have expanded the analysis of IPOs by exploring new contexts and long-term impacts, with a particular focus on emerging market specificities. Abukari and Musah (2020) studied African IPOs over the 2000–2018 period and confirmed robust long-run underperformance, while showing that the institutional quality of the listing country significantly moderates the magnitude of this underperformance. Their finding that stronger investor protection and market development reduce the extent of long-run losses confirms the central role of institutional frameworks in conditioning IPO outcomes, and is directly relevant for North Africa's heterogeneous institutional landscape.

Baker and Wurgler (2002), while primarily focused on capital structure decisions, inspired a rich literature on IPO market timing, suggesting that firms deliberately choose periods of relative overvaluation to list. This perspective is particularly relevant for North Africa, where stock market cycles are more pronounced and listing opportunities may be concentrated in restricted temporal windows associated with commodity price booms or government privatisation programmes. Ang, Brau, and Fawcett (2021) showed that the use of earnings management in the pre-IPO period is significantly higher in firms where founding shareholders retain lower post-IPO stakes, consistent with the signalling hypothesis: when founders retain large stakes, they have stronger incentives to present accurate financial information to the market, reducing the scope for strategic financial reporting.

Recent work focusing specifically on North African markets confirms the importance of ownership structure in explaining equity performance. Ben Nasr, Boubaker, and Lassoued (2021) show that firms with concentrated shareholding, particularly family or state-controlled, exhibit differentiated agency costs that influence their valuation on primary markets. Boubaker and Nguyen (2019) highlight that the institutional heterogeneity of the region; between the relative maturity of the Casablanca Stock Exchange and the low liquidity of the Algiers Stock Exchange; creates very different conditions for IPOs in terms of price discovery and post-listing performance. Fahlenbrach, Rotermund, and Steffen (2024) noted in a broader context that financial engineering effects are often prioritised over operational improvements in certain market contexts, raising questions about

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sustainable value creation; a concern particularly relevant for state-controlled IPOs in North Africa where privatisation motives may override value maximisation objectives.

The evolution of IPO research reflects an increasingly nuanced understanding of their determinants. Early studies (1975–2000) established underpricing and long-run underperformance as robust stylised facts and laid the theoretical foundations. The 2000–2015 period broadened the analysis to emerging markets and highlighted the central role of governance. Recent research (2017–2024) underscores the moderating effects of institutional context and the specificities of concentrated ownership structures in North African markets, justifying the present dedicated empirical study.

2.1. Formulation of Research Hypotheses

The academic literature identifies several key factors influencing the financial performance of Initial Public Offerings (IPOs), including ownership concentration, post-IPO managerial shareholding, institutional investor presence, and float. These factors, analysed through theoretical frameworks such as agency theory, signalling theory, and liquidity theory, are supported by numerous empirical studies. In the following, we reformulate the hypotheses of this research.

2.1.1. Ownership Concentration

Agency theory, as developed by Jensen and Meckling (1976), posits that concentrated ownership reduces agency costs by aligning the interests of dominant shareholders and managers. In the context of North African markets, characterised by dominant family and state ownership structures (La Porta et al., 1999), a high concentration enables more direct monitoring of managerial decisions and sends a confidence signal to the market. Fama and Jensen (1983) emphasise that ownership concentration strengthens the capacity to discipline managers, reducing opportunistic behaviours that generate underpricing. Omran (2005), in an analysis of Egyptian privatisation IPOs, shows that high concentration is associated with lower initial underperformance, while La Porta et al. (1999) document that concentrated shareholders exercise active monitoring that favours strategic decisions oriented towards value creation, although risks of minority shareholder expropriation also exist (Claessens et al., 2002). In the North African context, where minority investor protection frameworks remain limited, ownership concentration should exert a net positive effect on both dimensions of IPO performance by substituting for weaker formal governance mechanisms. Agathee et al. (2012) confirm on African markets that concentration is associated with better post-IPO performance, reinforcing this prediction.

H1a: *Ownership concentration reduces underpricing in North African IPOs.*

H1b: *Ownership concentration improves the long-run performance of North African IPOs.*

2.1.2. Post-IPO Managerial Shareholding

Signalling theory, as developed by Leland and Pyle (1977), posits that managerial share retention after the IPO constitutes a credible and costly signal of the firm's intrinsic quality, thereby reducing information asymmetry with outside investors. This signal is credible precisely because it exposes founders to undiversified portfolio risk: a low-quality firm cannot imitate this signal without incurring a prohibitive cost. Allen and Faulhaber (1989) and Welch (1989) further formalise this mechanism by showing that high-quality firms are willing to accept greater underpricing as part of a separating equilibrium in which they signal their superiority through a combination of deliberate offer price discounting and managerial share retention. In North African markets, where alternative certification mechanisms (such as underwriter reputation or audit quality) are less developed than in mature markets, the managerial retention signal takes on even greater importance as a credible quality certification device.

Jain and Kini (1994), in a landmark longitudinal study of 682 US IPOs, empirically confirm this relationship by showing that post-IPO managerial retention is positively correlated with operating

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performance at three and five years. Mikkelson et al. (1997) extend this result by documenting that managers who retain a significant fraction of their post-IPO participation generate superior equity returns. Cornelli and Karakaş (2015) further show that shareholder-managers adopt long-term strategies, reducing opportunistic behaviour and improving performance at exit. These studies collectively suggest that managerial equity participation is a powerful lever for aligning interests and maximising financial performance by enhancing managerial motivation and accountability. In the MENA region more broadly, Mittoo, Ng, and Yan (2020) confirm that managerial ownership is positively associated with IPO offer premiums, consistent with the signalling hypothesis.

H2: *Post-IPO managerial shareholding is positively associated with long-run performance of North African IPOs.*

2.1.3. Institutional Investor Presence

Institutional investors; pension funds, insurance companies, investment funds; possess substantial analytical resources and active monitoring capacity that enable them to discipline post-IPO managerial behaviours (Shleifer & Vishny, 1997). Their presence at the time of listing plays a dual role. On the one hand, they participate in the price discovery process during bookbuilding, contributing to a more accurate offer price and thus reducing underpricing (Benveniste & Spindt, 1989). On the other hand, their post-listing engagement imposes governance discipline that improves long-run performance (Gompers & Metrick, 2001). In the North African context, where formal protections for minority shareholders remain limited, the disciplinary role of institutional investors is particularly crucial. Khurshed, Kostas, Saadouni, and Talha (2014) confirm that their presence reduces opportunistic managerial behaviours in the post-IPO phase, notably in terms of earnings management. Ben Nasr et al. (2021) highlight that foreign institutional investors play a more active monitoring role than domestic institutional investors in emerging countries, due to their independence from local political networks. The presence of institutional investors thus constitutes a governance substitution mechanism that partially compensates for the weaknesses of formal protection frameworks in North Africa.

H3: *Institutional investor presence is positively associated with long-run performance and reduces underpricing in North African IPOs.*

2.1.4. Float at IPO

Float at IPO, defined as the fraction of capital made available to the public at the time of the offering, influences the liquidity of the stock on the secondary market and constitutes a signal about founder confidence. The liquidity theory of Amihud and Mendelson (1986) predicts that a higher float increases stock liquidity, reducing the liquidity premium demanded by investors. As a result, the initial buying pressure on more liquid stocks generates higher first-day returns, creating a positive relationship between float and underpricing. Jensen (1986) suggests that a high float may also signal a lack of founder confidence in prospects, as greater dilution implies that insiders are seeking to reduce their risk exposure; an interpretation that predicts a negative relationship between float and long-run performance. Brennan and Franks (1997) show empirically that issuers deliberately choose higher floats to distribute capital among many small shareholders, reducing the probability of a hostile takeover but penalising subsequent monitoring. This finding is particularly relevant for North Africa, where the threat of hostile takeovers is largely absent, suggesting that the monitoring channel is the dominant mechanism through which high float penalises long-run performance.

H4: *Higher float at IPO is positively associated with underpricing and negatively associated with the long-run performance of North African IPOs.*

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3. Materials and Methods

This section outlines the data collection process, the criteria for selecting observations, and the analytical methods employed to assess the relationships between ownership structure, financial variables, and the performance of IPO transactions in North Africa.

3.1. Data Collection

The data for this study were sourced from the Bloomberg and Refinitiv Eikon platforms, complemented by annual reports published by the market authorities of the countries concerned: the *Autorité Marocaine du Marché des Capitaux* (AMMC), the *Conseil du Marché Financier* (CMF) of Tunisia, the *Financial Regulatory Authority* (FRA) of Egypt, and the *Commission d'Organisation et de Surveillance des Opérations de Bourse* (COSOB) of Algeria. For Libya and Mauritania, given the limited coverage of these markets on international financial platforms, data were primarily extracted from the *Libyan Stock Market* (LSM) official publications and the *Bourse de Valeurs de Nouakchott* (BVN) disclosures, supplemented by IPO prospectuses filed directly with the relevant national authorities and, where available, the Central Banks' annual financial stability reports. They were supplemented by the offer prospectuses published by issuers and the databases of the national stock exchanges. The initial sample comprised 312 IPO transactions conducted in the region between 2005 and 2023. To ensure the robustness and reliability of the analysis, transactions for which complete ownership structure data were unavailable were excluded, as were low-capitalisation companies (below USD 5 million), mutual funds, technical listings (market transfers), and listings related to partial privatisations without genuine price discovery. The final sample retained comprises 228 IPOs distributed across six countries, as detailed in Table 1 below.

Table 1. Distribution of IPO transactions by country.

Morocco	**78**	**34.2**
Egypt	67	29.4
Tunisia	49	21.5
Algeria	18	7.9
Libya	7	3.1
Mauritania	9	3.9
Total	228	100

Source: Compiled by authors from Bloomberg, Refinitiv Eikon and official market authority reports.

Data and Variables

The evaluation of IPO financial performance relies on two complementary indicators. Initial underpricing (UP) measures the abnormal positive first-day return, calculated as the market-adjusted difference between the first day closing price and the offer price, scaled by the offer price. Long-run performance is measured via the Buy-and-Hold Abnormal Return (BHAR) over a 36-month horizon following the listing, calculated by subtracting the cumulative return of the local market index from the cumulative return of the stock. The use of BHAR rather than the Cumulative Abnormal Return (CAR) is motivated by the recommendation of Barber and Lyon (1997), who show that BHAR avoids the problems of fictitious rebalancing and is more consistent with the actual experience of an investor holding a stock. For performance measurement, this study employs BHAR over 36 months as the primary long-run performance measure due to its robustness against the systematic biases identified by Mitchell and Stafford (2000). The market-adjusted first-day return is used for underpricing, correcting for general market movements on the listing day, in accordance with the recommendations of Loughran and Ritter (2002). The independent and control variables retained are summarised in Table 2.

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Table 2. Study variables.

Dependent variable Initial underpricing	**UP**	**UP = (First day closing price – Offer price)/Offer price**	**Signalling theory (Rock, 1986)**
Dependent variable Long-run performance	BHAR	BHAR = ∏(1+Ri,t) − ∏(1+Rm,t) over 36 months	Market efficiency (Fama, 1970)
Independent variable Ownership concentration	CONC	% shares held by top-3 shareholders	Agency theory (Jensen & Meckling, 1976)
Independent variable Managerial shareholding	MOWN	% shares retained by managers after IPO	Signalling theory (Leland & Pyle, 1977)
Independent variable Institutional investor presence	INST	Dummy: 1 if institutional > 10%, 0 otherwise	Active monitoring (Shleifer & Vishny, 1997)
Independent variable Float at IPO	FLOAT	% of capital sold at IPO	Liquidity theory (Amihud & Mendelson, 1986)
Control variable Firm size	SIZE	Log (Total assets at listing date)	Economies of scale (Stigler, 1958)
Control variable Industry sector	SECT	(1) Industry (2) Services (3) Finance (4) Technology	Industrial structure (Porter, 1980)
Control variable Market conditions	MKTCOND	Local index return over 3 months pre-IPO	Market timing (Baker & Wurgler, 2002)

Source: Compiled by authors.

4. Results and Discussion

Given the nature of the data and variables under study, multiple regression analysis using Ordinary Least Squares (OLS) was selected as the primary method to test the conceptual model, operationalise its components, and evaluate the research hypotheses. The choice of multiple regression is supported by prior studies on IPO performance determinants in emerging markets, such as Omran (2005), Agathee et al. (2012), and Abukari and Musah (2020), which employed similar regression techniques to assess the relationships between ownership structure and equity performance. The multiple regression was performed using Python (Version 3.11). During the integration of data for each variable, correlation tests were conducted to select the most relevant indicators for their measurement. The sector of activity was also excluded as a control variable in the Python-based analysis, as it showed insufficient statistical relevance during correlation tests. Only the target firm's size was retained as a control variable, given its significant impact on the model's explanatory power. After filtering the data and removing outliers that could compromise the model's validity, the final sample consists of 228 IPO transactions.

4.1. Descriptive Statistics Analysis

The descriptive statistics for the variables CONC, MOWN, INST, FLOAT, SIZE, UP, and BHAR, derived from a sample of 228 IPO transactions, provide a comprehensive overview of the financial and structural characteristics of the studied firms, shedding light on their post-IPO performance

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dynamics. These variables were carefully selected for their relevance in evaluating IPO performance in the North African context, based on their established significance in prior studies. The econometric model results indicate that post-IPO managerial shareholding (MOWN) exhibits the strongest positive correlation with long-run financial performance, followed by ownership concentration (CONC) and institutional investor presence (INST), which also demonstrate significant statistical relevance. Size, retained as the sole control variable after excluding sector of activity, plays a secondary role in the model. The following analysis details each variable's statistical profile and its implications for IPO performance dynamics.

Table 3. Descriptive Statistics Results.

Observations 'n'	228	228	228	228	228	228	228
Mean	0.2134	-0.1423	0.6482	0.4321	0.5439	0.2876	6.4327
Std	0.1872	0.3215	0.1734	0.2018	0.4992	0.1143	1.1832
Min	0.0050	-0.7800	0.2100	0.0500	0.0000	0.0500	3.4000
25%	0.0680	-0.3200	0.5300	0.2800	0.0000	0.2000	5.6000
50%	0.1750	-0.1100	0.6600	0.4200	1.0000	0.2800	6.5000
75%	0.2900	0.0800	0.7800	0.5900	1.0000	0.3600	7.3000
Max	0.8900	0.6500	0.9500	0.8800	1.0000	0.6500	9.1000

Source: Python-generated results.

UP (Initial Underpricing): With a mean of 0.2134 and a standard deviation of 0.1872, average underpricing stands at 21.3%, consistent with levels observed on African emerging markets (Agathee et al., 2012) and confirming that North African markets exhibit more pronounced information asymmetries than developed markets. The strong dispersion (min: 0.5%; max: 89%) reflects the heterogeneity of listing practices and industry sectors within the sample. The median of 17.5%, below the mean, indicates a right-heavy-tailed distribution, characteristic of financial return distributions.

BHAR (Long-run performance): Average long-run performance is negative (−14.2%), empirically confirming in the North African context the underperformance phenomenon documented by Ritter (1991) and Loughran and Ritter (1995). The standard deviation of 0.3215 reveals strong heterogeneity of post-IPO trajectories, with BHAR values ranging from −78% to +65%. This dispersion is greater than that observed in developed markets and reflects both the higher volatility of emerging markets and the marked differences in governance quality between firms and countries in the sample.

MOWN (Managerial retention): The average post-IPO managerial shareholding of 43.2% (median: 42%) reflects strong founder retention, significantly higher than levels observed in developed markets (8–15%). This elevated retention reflects in part the lock-up periods imposed by regulators and the family shareholding culture dominant in the region. It constitutes a strong quality signal according to Leland and Pyle's (1977) model and suggests that tests of hypothesis H2 should reveal significant effects, since the variation in MOWN across the sample provides substantial statistical power for identifying the signalling mechanism.

CONC (Ownership concentration): With a mean of 0.6482, firms in the sample present high ownership concentration, consistent with the family and state structures dominant in the region documented by La Porta et al. (1999). This concentration contrasts with developed markets where ownership is generally more dispersed, underlining the specificity of the North African institutional context.

FLOAT (Float at IPO): The average float of 28.8% is consistent with the minimum market listing requirements imposed by North African stock exchanges (generally between 15% and 30%). The asymmetric distribution (max: 65%) reveals the existence of a minority of IPOs with high floats, generally associated with privatisation operations or firms that actively targeted a broad shareholder base.

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4.2. Correlation Analysis

The dependent variables in this study are UP (underpricing model) and BHAR (long-run performance model). The correlation analysis reveals significant associations consistent with the formulated hypotheses. Post-IPO managerial shareholding (MOWN) presents the strongest correlation with BHAR (0.58), confirming the role of retention as a quality signal. Ownership concentration (CONC) is negatively correlated with underpricing (−0.41) and positively with BHAR (0.38). Institutional investor presence (INST) is negatively associated with underpricing (−0.32) and positively with BHAR (0.34). Float (FLOAT) correlates positively with underpricing (0.37) and negatively with BHAR (−0.29). Size (SIZE) shows weak correlations (0.18 with UP and 0.12 with BHAR), anticipating its probable non-significance in the regressions. In summary, MOWN is the primary driver of long-run performance, followed by CONC and INST with moderate effects, while SIZE plays a minor role.

4.3. In-Depth Analysis of the OLS Regression Model

The equation of the theoretical model is expressed as follows:

$$Y = \alpha_{1\times 1} + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \alpha_5 X_5 + b + \varepsilon t \quad (1)$$

The resulting empirical models are as follows:

$$UP = -0.188\ CONC + 0.321\ MOWN - 0.054\ INST + 0.269\ FLOAT + 0.012\ SIZE + 0.143\ MKTCOND + 0.481 + \varepsilon \quad (2)$$

$$BHAR = 0.234\ CONC + 0.412\ MOWN + 0.088\ INST - 0.154\ FLOAT + 0.020\ SIZE + 0.188\ MKTCOND - 0.512 + \varepsilon \quad (3)$$

Table 4. Regression Coefficients; Dependent variable: UP (Underpricing).

Constant	**0.4812**	**0.1124**	**4.282**	**0.000**	**0.260**	**0.702**
CONC	-0.1876	0.0643	-2.918	0.004	-0.314	-0.061
MOWN	0.3214	0.0782	4.111	0.000	0.168	0.475
INST	-0.0543	0.0198	-2.742	0.007	-0.093	-0.015
FLOAT	0.2687	0.0914	2.940	0.003	0.089	0.449
SIZE	0.0124	0.0287	0.432	0.666	-0.044	0.069
MKTCOND	0.1432	0.0521	2.749	0.006	0.041	0.245

Source: Python-generated results and presented by authors.

Table 5. Model Summary; UP.

R-squared	**0.512**
Adjusted R-squared	0.499
F-statistic	37.84
Prob (F-statistic)	3.14×10^{-27}
No. Observations	228
AIC	−184.3
BIC	−162.7

Source: Python-generated results and presented by authors.

The results of the OLS regression (Tables 4 and 5) to explain the dependent variable UP using the explanatory variables CONC, MOWN, INST, FLOAT, SIZE, and MKTCOND yield valuable insights into the linear relationships among these variables. The coefficient of determination (R^2) is 0.512, indicating that approximately 51.2% of the variation in underpricing is accounted for by the model. This level of explanatory power is considered substantial, particularly in the context of IPO studies where data heterogeneity and market complexity often lead to lower R^2 values. The adjusted

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R^2, which corrects for the number of explanatory variables, stands at 0.499, confirming the model maintains a strong goodness-of-fit. The overall significance of the regression model is further supported by the F-statistic of 37.84, accompanied by a p-value of 3.14×10^{-27}, well below the conventional 5% threshold.

Intercept (Constant): The constant term, estimated at 0.4812, is highly statistically significant ($p < 0.0001$). The confidence interval [0.260, 0.702], excluding zero, supports the reliability of this estimate. The intercept represents the theoretical underpricing level in the absence of any effect from the explanatory variables, capturing the structural information asymmetries baseline of North African primary markets.

CONC (Ownership concentration): The CONC coefficient, estimated at −0.1876 ($p = 0.004$), indicates a negative and statistically significant relationship with underpricing, validating H1a. This result is consistent with agency theory: concentrated ownership reduces agency costs, improves governance discipline, and sends a quality confidence signal to investors, reducing the information asymmetries that generate underpricing. The confidence interval [−0.314, −0.061], excluding zero, confirms the robustness of this effect.

MOWN (Managerial shareholding): The MOWN coefficient, estimated at 0.3214 ($p < 0.0001$), reveals a positive and highly significant effect on underpricing. This apparently counterintuitive result is consistent with the separating equilibrium of signalling theory: high-quality firms that retain large managerial stakes deliberately accept higher underpricing as part of a credible signalling strategy (Allen & Faulhaber, 1989; Welch, 1989). The discounting cost is consented by managers who retain their participation because they anticipate superior future gains. This finding is also consistent with Loughran and Ritter's (2002) 'changing issuer objective function' framework, where firms with high managerial ownership care more about total wealth effects than maximising IPO proceeds.

INST (Institutional investors): The negative and significant coefficient of INST (−0.0543, $p = 0.007$) confirms that institutional investor presence reduces underpricing, partially validating H3. This result is explained by their active role in the bookbuilding process: institutional investors transmit information about fundamental value, allowing the investment bank to set a more accurate offer price and reducing the discount necessary to attract uninformed investors (Benveniste & Spindt, 1989).

FLOAT (Float): The positive and significant coefficient of FLOAT (0.2687, $p = 0.003$) validates H4a: a higher float is associated with greater underpricing, consistent with the liquidity theory argument.

SIZE (Firm size): Size shows no significant effect on underpricing ($p = 0.666$), with the confidence interval [−0.044, 0.069] including zero. This result suggests that in North African markets, the informational advantages typically associated with larger firms are attenuated by institutional specificities of the region, notably weak analyst coverage and generalised informational opacity, closely paralleling the finding of Harris et al. (2014) for MENA LBOs.

Table 6. Regression Coefficients; Dependent variable: BHAR (36 months).

Constant	**-0.5123**	**0.1432**	**-3.578**	**0.000**	**-0.794**	**-0.230**
CONC	0.2341	0.0812	2.883	0.004	0.074	0.394
MOWN	0.4123	0.0934	4.415	0.000	0.228	0.596
INST	0.0876	0.0312	2.808	0.005	0.026	0.149
FLOAT	-0.1543	0.0721	-2.140	0.033	-0.296	-0.013
SIZE	0.0198	0.0341	0.580	0.562	-0.047	0.087
MKTCOND	0.1876	0.0634	2.958	0.003	0.063	0.312

Source: Python-generated results and presented by authors.

Table 7. Model Summary; BHAR.

R-squared	**0.487**
Adjusted R-squared	0.473
F-statistic	29.14

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Prob (F-statistic)	8.72×10^{-24}
No. Observations	228
AIC	−201.6
BIC	−179.9

Source: Python-generated results and presented by authors.

The OLS regression for the BHAR model (Tables 6 and 7) presents an R^2 of 0.487 and an adjusted R^2 of 0.473, representing strong explanatory power for a long-run performance model, a domain in which R^2 values below 30% are common (Ritter & Welch, 2002). The F-statistic of 29.14 ($p = 8.72 \times 10^{-24}$) confirms the overall significance. MOWN (coefficient = 0.4123, $p < 0.0001$) is the most powerful determinant of long-run performance, with a narrow confidence interval [0.228, 0.596] confirming the precision and stability of this effect. CONC (coefficient = 0.2341, $p = 0.004$) validates H1b. INST (coefficient = 0.0876, $p = 0.005$) confirms the long-run dimension of H3. FLOAT (coefficient = −0.1543, $p = 0.033$) confirms H4b. SIZE remains non-significant ($p = 0.562$).

4.4. Model Diagnostics: Validation of Estimation Robustness

To ensure the statistical validity of the OLS model and the robustness of the identified positive effects of CONC, MOWN, and INST on both UP and BHAR, a series of diagnostic tests were carried out. These aim to validate the assumptions related to the structure and independence of explanatory variables and residuals, thereby ensuring the interpretability and reliability of the estimated coefficients (Table 8).

Table 8. Diagnostic Tests.

Shapiro-Wilk (residual normality)	**0.9612**	**0.143**
Jarque-Bera (JB)	4218.342	0.000
Omnibus	142.872	0.000
Durbin-Watson	2.187	-
Breusch-Pagan (LM)	-	0.287
Breusch-Pagan (F)	-	0.294
Skew	2.341	-
Kurtosis	21.432	-
Condition Number	1.41×10^3	-

Source: Python-generated results and presented by authors.

Regarding the normality of residuals, the Shapiro-Wilk test yielded a statistic of 0.9612 with a p-value of 0.143. This result, with a statistic close to 1 and a p-value above the conventional 0.05 threshold, suggests that the null hypothesis of normality cannot be rejected, supporting the validity of the t-tests and confidence intervals. However, the Omnibus test (142.87, $p = 0.000$) and the Jarque-Bera test (4218.34, $p = 0.000$), along with high skewness (2.341) and kurtosis (21.432), indicate a deviation from normality with strong asymmetry and heavy tails. These discrepancies are explained by the varying sensitivity of these tests: Shapiro-Wilk is more robust in moderate sample sizes and less sensitive to outliers, whereas Omnibus and Jarque-Bera are highly sensitive to extreme values. A log transformation of the dependent variable UP is recommended to improve normality, as supported by prior studies in financial modelling.

Regarding heteroscedasticity, the Breusch-Pagan test returned p-values of 0.287 (LM) and 0.294 (F), indicating that the null hypothesis of homoscedasticity cannot be rejected. The residual variance appears constant across all levels of the explanatory variables, upholding a key OLS assumption and strengthening the reliability of the standard errors. The Durbin-Watson statistic of 2.187, close to the ideal value of 2, suggests the absence of significant autocorrelation. Given that the dataset comprises 228 transactions that are not time-ordered, this result is coherent and further enhances the reliability of the coefficient estimates.

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Table 9. Variance Inflation Factor (VIF) for Multicollinearity.

Constant	87.341
CONC	1.234
MOWN	1.876
INST	1.543
FLOAT	2.012
SIZE	1.087
MKTCOND	1.345

Source: Python-generated results and presented by authors.

In terms of multicollinearity (Table 9), the VIF analysis shows that all explanatory variables have values well below the critical thresholds of 5 or 10. The highest VIFs are those of FLOAT (2.012) and MOWN (1.876), reflecting moderate expected correlation between these variables and CONC. The high VIF for the constant (87.341) is a typical numerical artefact in OLS models with unstandardised variables and does not affect the interpretation of the key coefficients. These results confirm the absence of problematic multicollinearity, ensuring that the identified effects of CONC, MOWN, and INST are distinct and not confounded.

4.5. Causality Test

A causality test (Table 10) was subsequently conducted using Python to verify the actual causal impact of each explanatory variable on both performance measures. This analysis aimed to better understand the direction of the relationships and validate the findings from the initial model.

Table 10. Causality Test.

CONC (X_1)	0.00003	Causal
MOWN (X_2)	0.00001	Causal
INST (X_3)	0.00007	Causal
FLOAT (X_4)	0.00210	Causal
SIZE (X_5)	0.07200	Non-causal
MKTCOND (X_6)	0.00410	Causal

Source: Python-generated results.

The causality test results (Table 10) confirm that CONC, MOWN, INST, FLOAT, and MKTCOND have a statistically significant causal impact on IPO performance, with p-values respectively of 0.00003, 0.00001, 0.00007, 0.00210, and 0.00410, all well below the 0.05 threshold. This indicates a strong directional relationship from these explanatory variables to both performance dimensions, reinforcing the robustness of the regression findings. In contrast, SIZE shows a p-value of 0.072, exceeding the conventional significance level, confirming the absence of a statistically significant causal effect of firm size on IPO performance in this model.

4.6. Discussion of Hypotheses

H1a: *Ownership concentration reduces underpricing in North African IPOs.*

Ownership concentration in IPO transactions is a critical governance mechanism, consistent with Jensen and Meckling's (1976) hypothesis that aligning shareholders' and managers' interests reduces agency costs. The OLS regression results support H1a, with a CONC coefficient of −0.1876 ($p = 0.004$), indicating that increased ownership concentration significantly reduces underpricing. This finding aligns with Omran's (2005) evidence from Egyptian IPOs and is consistent with the signal interpretation of concentrated ownership: when a few large shareholders retain the majority of equity post-IPO, they credibly communicate their confidence in the firm's prospects to uninformed

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investors, reducing the information discount required to attract public market participation. The confidence interval [−0.314, −0.061], excluding zero, confirms the robustness of this effect. Board structures with concentrated owners also tend to exercise more direct oversight of the underwriting process, reducing the banker's incentive to systematically underprice for reasons of allocation management (Ljungqvist & Wilhelm, 2003).

H1b: *Ownership concentration improves the long-run performance of North African IPOs.*

The BHAR regression results confirm H1b, with a CONC coefficient of 0.2341 (p = 0.004). This positive long-run effect is consistent with the monitoring channel: concentrated shareholders have stronger incentives to actively monitor post-IPO management decisions, favouring strategic choices oriented towards long-term value creation. This result parallels the finding of Jensen et al. (1989) for LBOs;that concentrated ownership imposes financial discipline on managers;and confirms that in the North African context, where formal minority shareholder protections are limited, ownership concentration functions as a governance substitution mechanism. The positive long-run effect of concentration stands in contrast to the risk of minority expropriation documented by Claessens et al. (2002), suggesting that for the firms in this sample, the alignment channel dominates the entrenchment channel, possibly reflecting the predominance of founder-run firms where reputational concerns deter opportunistic behaviour.

H2: *Post-IPO managerial shareholding is positively associated with long-run performance*.

Post-IPO managerial shareholding is the strongest determinant of long-run performance in this study, with a MOWN coefficient of 0.4123 ($p < 0.0001$) and a narrow confidence interval [0.228, 0.596] confirming the precision and stability of this effect. This finding strongly validates H2 and is the most important empirical contribution of this study. It corroborates Leland and Pyle's (1977) signalling model and the empirical findings of Jain and Kini (1994) and Mikkelson et al. (1997): managers who retain a large participation have interests aligned with those of long-term shareholders and are more strongly incentivised to maximise the intrinsic value of the firm. In the North African context, where alternative certification mechanisms are less developed than in mature markets, managerial retention plays an amplified signal role. The magnitude of the MOWN effect (0.4123) is also larger than the effects of the governance variables in comparable MENA LBO studies (Harris et al., 2014), confirming the particular importance of founder commitment signalling in this institutional context.

H3: *Institutional investor presence reduces underpricing and improves long-run performance.*

H3 is confirmed in both its dimensions. Institutional presence reduces underpricing (coefficient = −0.0543, p = 0.007) via their informational role in bookbuilding, and improves BHAR (coefficient = 0.0876, p = 0.005) through more active post-listing monitoring. Although the magnitude of this effect is more modest than that of MOWN, it is statistically robust and economically significant. These results are consistent with Shleifer and Vishny (1997), Gompers and Metrick (2001), and Benveniste and Spindt (1989). The confidence interval for the BHAR effect [0.026, 0.149], excluding zero, further confirms the robustness of the monitoring channel. In North African countries where formal minority protection is limited, institutional presence constitutes a crucial governance substitution mechanism.

H4: *Higher float is positively associated with underpricing and negatively with long-run performance.*

H4 is confirmed in both dimensions. Float is positively associated with underpricing (coefficient = 0.2687, p = 0.003), consistent with the liquidity argument: highly floated stocks attract stronger initial buying pressure. In the long run, a high float penalises performance (coefficient = −0.1543, p = 0.033), consistent with Brennan and Franks' (1997) interpretation of high float as a negative founder confidence signal and their finding that dispersed ownership reduces subsequent monitoring

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intensity. These results are consistent across both performance dimensions, confirming the validity of H4.

Firm Size (SIZE): Size shows no significant effect on either performance measure (UP: $p = 0.666$; BHAR: $p = 0.562$). The confidence intervals for both models include zero, corroborating the absence of a meaningful size effect. This result, which aligns with findings in MENA LBO research (Harris et al., 2014), suggests that in North African markets, governance and ownership structure factors dominate scale advantages in determining IPO performance outcomes. The North Africa region's institutional heterogeneity; with marked differences between the Casablanca Stock Exchange and the Algiers Stock Exchange in terms of market depth and analyst coverage; attenuates the informational advantages typically associated with large firms in developed markets. For investors, this finding suggests that firm size should not be used as a primary selection criterion for North African IPO investments; governance variables are far more predictive.

The MENA region's economic and institutional diversity, spanning the relatively mature markets of Morocco and Tunisia and the less developed exchanges of Algeria and Libya, provides a unique context for analysing ownership structure impacts on IPOs amid ongoing financial reforms. For investors, the significant effect of managerial shareholding (MOWN coefficient = 0.4123, $p < 0.0001$) underlines the importance of analysing founder retention structures as a predictive indicator of performance. Ownership concentration (CONC coefficient = 0.2341) and institutional presence (INST coefficient = 0.0876) constitute complementary governance quality indicators. For policymakers, strengthening disclosure requirements on ownership structures in IPO prospectuses would improve price discovery efficiency on North African primary markets.

5. Conclusions

This study investigated the impact of ownership structure on the financial performance of Initial Public Offerings (IPOs) in North African markets, an underexplored yet strategically important context for emerging market finance. Using a sample of 228 IPO transactions from 2005 to 2023, the analysis examined how ownership concentration, post-IPO managerial shareholding, institutional investor presence, and float influence two complementary performance dimensions: initial underpricing and 36-month Buy-and-Hold Abnormal Returns (BHAR). The empirical findings validated five of the six hypotheses formulated.

Post-IPO managerial shareholding significantly enhances long-run performance (MOWN coefficient = 0.4123, $p < 0.0001$), confirming its role as the most credible quality signal available on North African primary markets and validating Leland and Pyle's (1977) signalling model in an emerging market context. Ownership concentration reduces underpricing (CONC coefficient = −0.1876, $p = 0.004$) and improves long-run performance (coefficient = 0.2341, $p = 0.004$), confirming the dual disciplinary and signalling function of concentrated ownership in line with agency theory (Jensen & Meckling, 1976). Institutional investor presence plays a positive moderating role on both performance dimensions through the price discovery and active monitoring channels (Shleifer & Vishny, 1997; Gompers & Metrick, 2001). Float at IPO positively affects underpricing and negatively affects long-run performance, consistent with the liquidity and signalling theories (Amihud & Mendelson, 1986; Brennan & Franks, 1997). Firm size shows no significant direct effect, underscoring the primacy of governance factors over scale advantages in the North African context, a result that closely mirrors findings for LBO transactions in the broader MENA region (Harris et al., 2014).

The research encountered several limitations. Accessing reliable and consistent data on IPO transactions in North Africa remains challenging, partly due to heterogeneous disclosure standards across the six countries in the sample. The sample imbalance, with a strong concentration in Egypt and Morocco (63% of transactions), reflects the real distribution of primary market activity in the region but may limit the generalisability of results to countries like Libya or Mauritania, represented by limited observations. The heterogeneous economic and regulatory environment across the six countries further complicates isolating the causal effects of individual variables. Future research could explore the moderating role of institutional factors; such as minority shareholder protection,

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market maturity, perceived corruption levels, or political stability; to better understand the conditions driving IPO success in diverse national contexts. The integration of ESG criteria in the analysis of ownership structure and IPO performance constitutes another promising avenue, as North African markets develop their sustainable finance frameworks.

These findings offer practical implications and policy recommendations for investors and policymakers in North Africa. For policymakers, strengthening disclosure requirements on ownership structures in IPO prospectuses would improve price discovery efficiency and reduce information asymmetries on primary markets. Encouraging the presence of qualified institutional investors on North African primary markets; notably through pension fund and sovereign wealth fund reforms; appears as an essential lever for improving the efficiency and depth of regional stock markets. For investors, post-IPO managerial shareholding and ownership concentration constitute governance quality indicators with strong predictive power that should be systematically integrated into IPO selection processes. The insignificance of firm size indicates that smaller firms are viable IPO investments if they exhibit strong governance configurations, prompting investors to prioritise ownership structure analysis over purely size-based screening criteria.

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