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Post-IPO Stock Price Performance Analysis from an Information Asymmetry Perspective on the Indonesia Stock Exchange (2022-2025)

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ABSTRAK

The phenomenon of underpricing in initial public offerings (IPOs), where the offering price is systematically set below market value, has become a documented anomaly across global capital markets. This study aims to analyze post-IPO stock price performance on the Indonesia Stock Exchange (IDX) from January 2022 to March 2025 from an information asymmetry perspective, identify the determinants of underpricing, and test the long-run underperformance hypothesis in the context of post-pandemic emerging markets. The study used data from 190 IPO companies on the Indonesia Stock Exchange (IDX) between 2022 and 2025, raising a total of IDR 107.5 trillion. Stock performance was measured over five time horizons: 1 day, 1 week, 1 month, 6 months, and 1 year post-listing. Three proxies for information asymmetry were used as independent variables: the natural logarithm of the IPO price (Ln_P0), the natural logarithm of funds raised (Ln_Dana), and the number of underwriters (N_UW). The study constructed the AI Index as a composite measure of information asymmetry based on Min-Max normalization. Analytical methods included a one-sample t-test, a non-parametric Friedman test with post-hoc Wilcoxon rank sum, and multivariate Ordinary Least Squares (OLS) regression with IPO year and quarter as control variables.

First, underpricing is significantly proven with an average initial return of 15.93% [$t(189) = 12.90$, $p < 0.001$, 95% CI: 13.51%-18.35%]. Second, there is a very significant difference in performance between time horizons [Friedman chi-square(4) = 79.84, $p < 0.001$], with a median return pattern decreasing from +15.00% (1 day) to -22.50% (1 year). Third, the OLS regression model for 1D Return is significant [$F(8,181) = 2.617$, $p = 0.010$, $R^2 = 10.4\%$]: Ln IPO Price has a negative effect (beta = -0.064, $p = 0.007$); Ln Funds has a positive effect on IR (beta = +0.054, $p = 0.002$) and 1Y Return (beta = +0.703, $p = 0.029$); The number of underwriters has a significant negative effect (beta = -0.024, $p = 0.019$). Fourth,

the long-run underperformance hypothesis is not proven based on the mean (+44.01%), but is supported at the median level (median 1Y = -22.50%), indicating that the majority of IPO shares experience losses within 1 year after listing.
The study confirms the validity of the Rock's Winner's Curse Model in the Indonesian capital market and identifies a demand-side effect operating in parallel with the information asymmetry mechanism, where large-scale IPOs generate higher initial returns through oversubscription. The extreme divergence between the mean and median 1-Year Returns underscores the importance of comprehensive distribution analysis in IPO performance research. Practical implications include horizon-based investment strategy guidance for investors, pricing optimization recommendations for issuers and underwriters, and price discovery policy reform recommendations for the Financial Services Authority (OJK) and the Indonesian Stock Exchange (IDX).

Keywords: Initial Public Offering (IPO); underpricing; initial return; information asymmetry; long-run underperformance; Indonesia Stock Exchange; Rock's Winner's Curse Model; OLS regression; AI Index

INTRODUCTION

Research Background

The capital market is one of the main pillars of the financial system, serving as a vehicle for long-term capital mobilization between those in need of funds (issuers) and those with excess funds (investors) (Mladenovski, 2025). In Indonesia, the Indonesia Stock Exchange (IDX) has grown into one of the largest capital markets in Southeast Asia (Endri et al., 2024), with a total market capitalization of over IDR 11,000 trillion (Gani et al., 2026) and a rapidly growing number of investors, from around 3.8 million at the end of 2020 to over 20 million by the end of 2025 (Worang, 2026). This growth reflects the capital market's growing role as a development financing instrument and a means of public investment.

One of the most significant events in the life cycle of a company participating in the capital markets is the Initial Public Offering (IPO). An IPO is the moment when a company sells its shares to the public for the first time through market mechanisms (Megaravalli, 2023). For companies, an IPO opens access to a much broader range of funding sources than debt-based financing, while also enhancing their public profile and corporate governance (Colak et al., 2025). For investors, participation in an IPO offers the opportunity to acquire ownership in a company (Megaravalli, 2023) with growth potential from the early stages of its public listing (Lefebvre, 2023).

IPO activity in Indonesia has experienced a remarkable acceleration in the post-pandemic period. After a disruption in 2020, a wave of IPOs swept through the IDX throughout 2022 and

2023, with 59 and 79 new companies listed, respectively, raising a total of approximately IDR 33.1 trillion and IDR 54.1 trillion. This trend reflects not only a strong economic recovery but also the growing maturity of Indonesia's capital market ecosystem, supported by regulatory reforms, increased investment literacy, and the penetration of digital investment platforms.

However, behind this encouraging surge in IPO activity lies a market anomaly that has long been a puzzle in financial literature: the phenomenon of IPO underpricing. Underpricing occurs when the IPO offering price is systematically set below its true market value (Firmino De Oliveira et al., 2023), allowing investors who successfully acquire IPO shares to realize profits immediately on the first day of trading . Data from this study strongly confirms the existence of this phenomenon on the IDX: of 190 companies conducting IPOs between January 2022 and March 2025, the average initial return (the difference between the first-day closing price and the IPO price) reached 15.93%, with 78.4% (149 of 190 companies) experiencing positive underpricing. Only 18.4% of companies experienced overpricing (*negative initial return*).

This underpricing anomaly has significant economic implications. In the context of this research sample, the average underpricing of 15.93% of the total funds raised, amounting to Rp107.5 trillion, implies a significant amount of money left on the table, the value that should have been received by the issuer but transferred to new investors. This value represents the implicit costs borne by the issuer's existing shareholders and raises fundamental questions about the efficiency of the IPO pricing mechanism on the IDX.

A deeper paradox emerges when we examine the longer-term performance of IPOs. While investors who successfully secure IPO allocations at the offering price can enjoy significant gains on the first day (Bavachan & Muthu Gopala Krishnan, 2024), research across global capital markets consistently documents that IPOs tend to underperform the market (long-run underperformance) over a period of one to five years after listing (From & Grønkjær, 2024). Ritter (1991), who first systematically documented this phenomenon, found that investors who purchased IPO shares at the first-day closing price and held them for three years experienced 29% lower performance than a matched control group (Ritter, 1991). This phenomenon creates a paradoxical situation, gains for short-term investors (underpricing) but losses for long-term investors (long-run underperformance).

This research data shows that the same paradox also exists on the IDX. While the 1-year mean return was recorded at +44.01%, which would seem to indicate positive long-term performance, the median 1-year return was actually -22.50%. This dramatic divergence between the mean and median is a strong signal that the long-term return distribution is highly asymmetrical. A small number of exceptionally positive outliers (such as AMMN with a return of 481% and EURO with 217%) push the average upward, while the majority of IPO stocks actually experience losses. In a more representative distributional perspective, more than 50% of IDX IPO stocks from 2022-2025 are below their IPO price after 1 year of trading (IDX, 2026).

The fundamental questions that arise from these observations are: what causes this phenomenon of underpricing and long-run underperformance? Why do IPO prices systematically differ from true market values? What factors differentiate IPOs that maintain their long-term performance from those that do not? The answer, in the contemporary financial literature, is largely rooted in the concept of information asymmetry.

Information asymmetry in the context of an IPO refers to a situation where various parties involved issuers, underwriters, and investors have different access to (Firmino De Oliveira et al., 2023) and quality of information about the intrinsic value of a company planning an IPO (Sonu, 2022). Rock (1986) in his seminal model demonstrated that differences in information levels between informed and uninformed investors create an inherent need for issuers to set IPO prices below fundamental value to compensate for the adverse selection risk borne by uninformed investors (Rock, 1986). The greater the information asymmetry between the issuer and the market, the greater the discount required, and the higher the observed underpricing (Calomiris et al., 2022).

This information asymmetry framework is highly relevant in the context of the Indonesian capital market. The structure of the IDX IPO market has characteristics that structurally create relatively large information asymmetries: the dominance of retail investors who individually have limited research capacity, the limited number of securities analysts with coverage of IPO companies, the dominance of small- and medium-sized IPOs with limited market visibility, and the still highly variable quality of information disclosure in prospectuses. In such an environment, empirically examining how information asymmetry shapes IPO prices and performance has significant academic and practical relevance.

Problem Identification and Limitation

Identification of problems

Based on the background description above, several fundamental problems can be identified as follows:

1. The persistence of the underpricing phenomenon on the IDX indicates that the IPO pricing mechanism has not been operating efficiently, creating implicit costs borne by existing shareholders of the issuer and raising questions about the fairness of value allocation in the IPO process.
2. There are strong indications that the majority of IPO stocks on the IDX experience long-run underperformance, but this is masked by the presence of extreme positive outliers that distort the statistical average and have the potential to mislead investors who do not conduct careful distribution analysis.
3. Although information asymmetry theory has long been the dominant framework in explaining IPO underpricing, systematic empirical evidence on how various dimensions of information asymmetry in IPO pricing, issuance scale, and underwriter reputation simultaneously and separately affect IPO performance in Indonesia is still very limited, especially for the post-pandemic period.
4. There is limited understanding of the factors that differentiate IPOs with good long-term performance from those with poor, which is critical information for investors in making portfolio allocation decisions.

Restricting the problem

Given the broad scope of the IPO topic, this research is limited to the following aspects:

1. The study focused on companies conducting IPOs on the Indonesia Stock Exchange between January 2022 and March 2025 (n = 190 companies), excluding rights issues, bond offerings, or other financial instruments.
2. Stock performance is measured using raw returns over five time horizons (1 day, 1 week, 1 month, 6 months, and 1 year), not market-adjusted abnormal returns, due to the limitations of daily JCI data per specific date in the main data source.
3. The operationalized dimensions of information asymmetry are limited to three proxies that can be extracted from available data: IPO price, scale of funds raised, and number of underwriters.
4. The analysis does not differentiate the sample based on industrial sector, company size (beyond the scale of emissions), or ownership status (state-owned vs. private).

Formulation of the problem

Based on the identification and limitations of the problems that have been described, this study formulates the following research questions:

Table 1. Problem Formulation and Research Hypothesis

No.	Research Questions	Hypothesis	Theoretical basis
RQ1	Is there a statistically significant underpricing phenomenon in IPOs on the IDX during the 2022-2025 period?	H1: Mean initial return (IR) is significantly greater than zero	Winner's Curse Model (Rock, 1986)
RQ2	Is there a significant difference in IPO stock performance between different observation time horizons?	H2: Short-term performance is significantly different from long-term performance	Long-Run Underperformance (Ritter, 1991)
RQ3	How does the IPO price (as a proxy for information asymmetry) affect initial returns?	H3: IPO price has a significant negative effect on IR	IPO Price (Beatty & Ritter, 1986)
RQ4	How does the scale of IPO funds affect initial returns and long-term performance?	H4: Funds raised have an impact on IR and 1Y Return	Signaling Theory (Allen & Faulhaber, 1989)
RQ5	How does underwriter reputation affect initial returns and long-term performance?	H5: The number of underwriters has a negative effect on IR and a positive effect on 1Y Return.	Underwriter Reputation (R. Carter & Manaster, 1990)
RQ6	Is there a statistical long-run underperformance of IPO stocks on the IDX?	H6: Mean Return 1Y is significantly negative	Long-Run Underperformance (Loughran & Ritter, 1995)

Research purposes

Based on the formulation of the problem that has been determined, this research aims to:

1. Testing and quantifying the underpricing phenomenon in IPOs on the Indonesia Stock Exchange during the 2022-2025 period using comprehensive inferential statistical analysis.
2. Analyzing the performance patterns of IPO stocks across various time horizons and testing the long-run underperformance hypothesis in the context of the Indonesian capital market.
3. Identifying and estimating the influence of information asymmetry proxy variables including IPO price, scale of funds raised, and number of underwriters on the initial return and long-term performance of IPO shares.
4. Provides empirical contributions to the financial literature on the IPO phenomenon, particularly for the emerging market context in Southeast Asia post-COVID-19 pandemic.
5. Formulate practical implications and evidence-based policy recommendations for investors, issuers, underwriters, and regulators of the Indonesian capital market.

THEORETICAL BASIS

Basic Concepts of Initial Public Offering (IPO)

An Initial Public Offering (IPO) is defined as the process by which a company offers its shares to the general public for the first time through an organized capital market (Ritter & Welch, 2002). An IPO is a transformative milestone in a company's life cycle, the moment when a company transitions from a private to a public entity, with far-reaching consequences for governance, transparency, accountability, and access to capital resources.

From the issuer's perspective, the motivations for conducting an IPO include a variety of objectives: (1) access to long-term capital that does not have the obligation of periodic interest payments like debt, (2) creation of a secondary market for shares that allows initial shareholders and founders to diversify or liquidate some of their holdings, (3) enhancement of the company's profile and reputation through the more prestigious status of a public company, (4) provision of stock-

based incentives to employees as a retention and motivation tool, and (5) increased negotiating capacity with business partners and creditors (Pagano et al., 1998) (Pagano et al., 1998).

From an investor's perspective, IPOs offer the opportunity to invest in companies with growth potential from the early stages of their public listing. However, IPO investments also carry unique risks compared to investing in established stocks: limited historical information on the company's performance as a public entity, greater uncertainty about the company's intrinsic value, and potentially higher price volatility in the early trading period.

IPO Mechanism in Indonesia

The IPO process in Indonesia is comprehensively regulated by the Financial Services Authority (OJK) through a series of regulations, most notably OJK Regulation No. 53/POJK.04/2017 concerning Registration Statements for Public Offerings and Capital Increases of Public Companies. The IPO process on the IDX generally involves three main stages. The pre-IPO phase encompasses a series of internal and external preparations: corporate restructuring, selecting underwriters and supporting professionals (public accountants, legal consultants, appraisers), preparing a prospectus, conducting a comprehensive due diligence process, and submitting a registration statement to the Financial Services Authority (OJK) (Otoritas Jasa Keuangan, 2017). This phase typically takes 3-6 months for medium-sized companies.

The offering phase includes a bookbuilding period during which underwriters solicit interest from institutional investors to determine the price range, followed by a public offering period and share allocation. In Indonesia, the dominant pricing mechanism used is a combination of a fixed price for retail investors and bookbuilding for institutional investors. The post-IPO phase begins with the listing and initial trading of shares on the Indonesia Stock Exchange (IDX), followed by a lock-up period during which certain shareholders (typically founders and underwriters) are restricted from selling their shares. The price performance during this phase is the primary focus of this study.

The Role of Underwriters

Underwriters play a central role in the IPO process (Narang & Pradhan, 2026). The underwriter's function encompasses three main dimensions: certification, distribution, and stabilization (Baron, 1982, Booth & Smith, 1986). In the certification function, underwriters use their reputation to provide an implicit assurance to the market that the shares being offered have undergone adequate due diligence and are fairly priced (Y.-L. Wu et al., 2026). The stronger the underwriter's reputation, the stronger the certification (Y. Wu et al., 2025).

R. Carter & Manaster, (1990) found in their seminal study that IPOs underwritten by highly reputable underwriters experienced lower underpricing, consistent with the argument that underwriter reputation reduces information asymmetry between issuers and investors (R. Carter & Manaster, 1990). Megginson & Weiss, (1991) replicated this finding using a different measure of reputation (underwriter market share) and found consistent results (Megginson & Weiss, 1991). In the context of the IDX, the number of underwriters in the underwriting consortium is used as a proxy for reputation, given that larger consortia typically involve securities with stronger distribution capacity and reputations.

IPO Underpricing Theory

Rock's Winner's Curse Model: Foundations of Information Asymmetry Theory

Rock, (1986) laid the most influential theoretical foundation for explaining the phenomenon of IPO underpricing. This model is built on the fundamental assumption that the IPO market consists of two groups of investors with fundamentally different levels of information. Informed investors, generally institutional investors, securities analysts, and experienced market participants, have the ability to estimate the intrinsic value of IPO companies with greater accuracy (Hendrawan & Utama, 2024). Conversely, uninformed investors, who in the Indonesian context are very

dominant, given the very high proportion of retail investors who only have access to public information available in prospectuses and official announcements.

This adverse selection mechanism, which Rock labels the winner's curse, because uninformed investors "win" by obtaining full allocations to overpriced stocks, results in negative expected returns for uninformed investors unless the issuer engages in sufficient underpricing to compensate for the selection loss. Formally, the equilibrium condition that allows the uninformed investor participation necessary for a successful offering requires that the expected return for uninformed investors be at least equal to the risk-free rate of return.

The main empirical implications of Rock's model are: (1) the level of underpricing is directly proportional to the degree of information asymmetry between informed and uninformed investors, (2) IPOs with greater value uncertainty (higher ex-ante uncertainty) require greater underpricing, and (3) variables that reflect the quality of available information such as company size, underwriter reputation, and performance history will be negatively correlated with the level of underpricing.

(Beatty & Ritter, 1986) extended Rock's model by explicitly linking the degree of underpricing to ex-ante uncertainty about the IPO's value, as measured by variables such as firm age, offering size, and use of IPO proceeds. They also showed that underwriters who consistently underprice (or overprice) the IPO will lose market share, creating an incentive for underwriters to price accurately, a market discipline mechanism that maintains the quality of price discovery in the long run.

Signaling Theory in the Context of IPOs

A group of researchers developed an alternative perspective that views underpricing not as an unavoidable cost of information asymmetry, but as a deliberate signal sent by high-quality firms to the market (Allen & Faulhaber, 1989) (Grinblatt & Hwang, 1989) (Welch, 1989). These three models were developed independently but share the same basic premise.

The essence of Signaling Theory is that the market cannot directly observe company quality at the time of the IPO. This is due to asymmetry of information on the issuer's side (unlike Rock's model, which emphasizes asymmetry between investors). High-quality companies have an incentive to send signals that differentiate them from low-quality companies. Underpricing functions as an effective signal (Majhi, 2025) because it is costly: only truly high-quality companies can bear the current costs of underpricing because they have sufficiently bright future prospects to conduct seasoned equity offerings at higher prices later, so that the total value received from a series of offerings remains higher than that of low-quality companies attempting to mimic the signal.

Allen & Faulhaber (1989) formalized the conditions under which underpricing as a signal is a rational strategy: when the market can observe the firm's realized performance after the IPO, high-quality firms that engage in underpricing will gain a 'reputation' that allows them to conduct seasoned offerings at a premium. In a separating equilibrium, low-quality firms will not find it profitable to imitate the underpricing strategy because they lack the prospect of a profitable seasoned offering to cover the signaling costs.

Information-Based Pricing Theory: Bookbuilding and Prospect Theory

Benveniste & Spindt (1989) developed a theory explaining the bookbuilding mechanism as a way for underwriters to extract private information from institutional investors. In this model, institutional investors who possess positive information about a company's value need to be rewarded for honestly disclosing this information to underwriters, as disclosing positive information would raise the offering price and reduce their profits from purchasing IPO shares. Underwriters reward investors who provide positive information that proves accurate by allocating larger shares at a lower price (underpricing).

Loughran & Ritter (2002) developed a behavioral finance-based explanation called the Prospect Theory view of underpricing. They argue that managers of IPOs do not always maximize

the proceeds from the IPO, but rather consider the perceived change in their total wealth. Because managers generally still hold a significant portion of the company's shares, an increase in the market price beyond the IPO price (underpricing) actually increases their total wealth, so they are less concerned about moderate underpricing. This theory explains why underpricing can persist despite theoretically being detrimental to the issuer from the perspective of direct IPO revenues.

Impresario Hypothesis and Hot Issue Market

Shiller (1990) proposed a more behavioral hypothesis: underwriters deliberately create underpricing to generate enthusiasm and oversubscription, which serves as an effective "advertiser" for the issuer and reinforces the perception of a successful IPO. The analogy is that of a performing arts impresario who sets ticket prices below the equilibrium price to create a sense of exclusivity and enthusiasm. In this context, underpricing is not a signal of quality but a marketing mechanism.

Ibbotson & Jaffe, (1975) documented that underpricing clusters over time, with periods of very high underpricing (hot issue markets) followed by periods of low underpricing (cold markets). (Ritter, 1984) showed that hot issue markets correlate with high IPO volume and optimistic market sentiment. These findings are consistent with the hypothesis that issuers opportunistically exploit windows of opportunity when investor sentiment is high to conduct IPOs, even though these conditions are ultimately followed by poorer long-term performance.

IPO Long-Term Performance Theory

Long-Run Underperformance as Seminal Evidence

Ritter, (1991) opened a new chapter in IPO research by systematically documenting the phenomenon of long-run underperformance using a sample of 1,526 IPOs in the United States market from 1975 to 1984. Using the Wealth Relative method (comparing the cumulative returns of IPO stocks with the adjusted returns of a control group), Ritter found that investors who purchased IPO shares at the first-day closing price and held their positions for 3 years experienced 29.2% underperformance of a control portfolio of similar companies that did not conduct an IPO. This finding challenged the previously held assumption that first-day underpricing was adequate compensation for the risk of IPO investment.

Loughran & Ritter, (1995) extended their research to 4,753 IPOs from 1970 to 1990, with a 5-year observation horizon. They found that investors who bought IPO shares on the first trading day and held them for 5 years only earned a cumulative return of 15.7%, compared to 66.4% if they invested the same amount in comparable companies. They called this phenomenon a "new issues puzzle," explaining why investors continue to participate in IPOs despite historical evidence showing consistent long-term underperformance.

Long-Run Underperformance

Several theoretical explanations compete to explain the phenomenon of long-run underperformance. First, the Market Timing Hypothesis (Ritter, 1991) argues that companies exploit windows of opportunity when the market is hot, characterized by high valuations and excessive investor optimism, to conduct an IPO. Under these conditions, companies can sell shares at prices exceeding their fundamental value. When the market returns to more rational valuations, the IPO share price corrects downward.

Second, the Impresario Hypothesis (Shiller, 1990) predicts that deliberate underpricing by underwriters creates excessive enthusiasm that pushes stock prices beyond their intrinsic value in the first days of trading, followed by underperformance when the enthusiasm subsides.

Third, the Investor Sentiment Hypothesis explains long-run underperformance as a result of retail investor overoptimism, which drives up IPO prices at listing time (Baker & Wurgler (2006) & Ljungqvist (2007)). Gradually, as the company's actual performance is revealed and falls short of overly optimistic expectations, the stock price declines to a value that better reflects fundamentals.

Fourth, from a risk perspective, there is an argument that long-run underperformance represents a methodological bias arising from imprecision in the measurement of the control group's

expected returns (Fama, 1997). Fama argues that most of the evidence of long-run underperformance disappears when more sophisticated pricing models (such as the Fama-French three-factor model) are used to calculate abnormal returns.

Relative Wealth and Long-Term Performance Measurement

Ritter (1991) introduced Relative Wealth as a measure of long-term IPO performance that compares the accumulated wealth of IPO investors with that of investors who invested the same amount in a comparison portfolio. Formally, Relative Wealth is defined as the ratio of [1 + mean IPO return] to [1 + mean control group return]. A Relative Wealth below 1.0 indicates underperformance relative to the benchmark.

Lyandres et al., (2008) and Loughran & Ritter (2002) discuss various benchmark options used in the literature, including the CRSP value-weighted index, size-matched non-issuers, and Fama-French matched firms, and show that benchmark choice can significantly influence conclusions about the presence or absence of long-run underperformance. This is a major source of methodological debate in the IPO literature. In the context of this study, data limitations encourage the use of raw returns as a measure of performance, with the explicit recognition that market-adjusted abnormal returns would provide a more accurate measure.

Information Asymmetry Proxy Variables

In the IPO literature, the offer price has long been used as an inverse proxy for information asymmetry and ex-ante uncertainty. The basic logic is that firms that set low IPO prices are generally smaller, younger, and less well-known to the market characteristics that inherently create greater information asymmetry (Beatty & Ritter, (1986) & Michaely & Shaw (1994)).

Fernando et al. (2004) developed a specific argument regarding stock prices, stating that companies with very low stock prices (penny stocks) are generally less attractive to institutional investors and security analysts, who have a minimal threshold for investing their research resources. This lack of analyst coverage directly increases information asymmetry. Furthermore, low stock prices are often associated with lower market liquidity and wider bid-ask spreads, which are also manifestations of higher information asymmetry.

In the context of the IDX, the IPO price range is very wide, ranging from IDR 70 per share (EURO) to IDR 5,550 (AADI) in this study's sample. Companies with very low IPO prices (below IDR 100) are generally small companies that conduct IPOs through the IDX's acceleration board with more lenient requirements. These companies have very limited public information and tend to experience higher underpricing to compensate for greater information risk.

Scale of Funds Raised (Proceeds) as a Proxy

Total funds raised from an IPO (proceeds) are widely used in the literature as a proxy for IPO size and firm visibility (R. B. Carter et al., (1998) & Ritter, 1991)). IPOs with larger proceeds tend to: (1) receive broader analyst coverage because it is economically feasible for securities firms to allocate their research resources, (2) attract more intensive financial media attention, (3) involve larger and more experienced underwriters with stronger distribution capabilities, and (4) receive more significant institutional investor participation.

All these factors collectively reduce information asymmetry, which should correlate with lower underpricing. However, this study found that in the 2022-2025 IDX sample, Ln_Dana actually had a positive effect on initial returns, interpreted as a demand-side effect where large IPOs generate greater oversubscription, driving prices higher on the first day of trading. This finding is consistent with (Field & Lowry, 2009), who showed that in a hot market dominated by retail investors, investor demand can dominate the influence of information asymmetry in determining initial returns.

Underwriter Reputation as a Proxy

(R. Carter & Manaster, 1990) developed a measure of underwriter reputation based on tombstone announcement rankings (the order of underwriter names in IPO advertisements, with higher positions reflecting higher reputation). They found that highly reputable underwriters resulted in lower underpricing and better long-term performance. (Megginson & Weiss, 1991) developed an alternative based on underwriter market share and found consistent results.

(Johnson & Miller, 1988) offer a mechanistic explanation: highly reputable underwriters possess valuable reputational capital that they are unwilling to risk by underwriting the IPOs of low-quality firms or setting inaccurate prices. This reputation serves as an implicit guarantee to investors about the minimum quality of the IPO firm and the reliability of the pricing.

Empirical Evidence Review of Previous Studies

(Ljungqvist, 2007) in a comprehensive survey covering over 50 countries, found that underpricing is a universal phenomenon present in all capital markets studied, albeit at highly variable levels. Average underpricing ranges from around 5% in Scandinavian countries to over 100% in some emerging markets. Countries with weaker investor protection, looser regulations, and a higher proportion of retail investors tend to experience higher underpricing.

From a long-term performance perspective, (Loughran & Ritter, 1995) found in a survey of 25 countries that long-run underperformance is a much more conditional phenomenon than underpricing. While first-day underpricing is almost always positive, long-term performance varies significantly across countries and periods. (Fama, 1997) argued that most evidence of long-run underperformance in the US market disappears when more accurate pricing models are used, suggesting that this phenomenon may be a methodological artifact.

Meanwhile, research on IPOs in Indonesia has been growing since the early 1990s, in line with the development of the Indonesian capital market itself. (Yolana & Martani, 2005) used a sample of 79 IPOs from 1994 to 2001 and found an average underpricing of 24.73%. They identified company size and underwriter reputation as significant factors influencing underpricing, consistent with predictions from information asymmetry theory.

(Kristiantari, 2013) examined 161 IPOs from 1997 to 2010 and found that financial information variables (leverage, profitability) and offering characteristics (offering size, offering price) significantly influenced underpricing. This finding strengthens the relevance of the information asymmetry framework for the IDX context. (Pelawi & Pelawi, 2023) used panel data of 318 IPOs from 2010 to 2020 and found that institutional investor participation played a role in reducing underpricing, consistent with the bookbuilding model of Benveniste and Spindt (1989).

However, most Indonesian IPO research has several limitations acknowledged by the researchers: (1) the coverage period generally does not extend beyond 2019, so none has examined the unique post-pandemic IPO dynamics; (2) the use of a single return measure (usually only the initial return or the most recent 6-month return) without comprehensive multi-horizon analysis; and (3) the relatively rare use of more robust non-parametric distribution analysis for highly non-normal return data. This research is designed to fill these gaps.

Identifying Research Gaps

The literature review that has been conducted identified several significant and relevant research gaps that serve as justification for this research:

Table 2. Research Gap Matrix

Gap Dimension	Current State of Literature	Identified Gaps	Contribution of This Research
Temporal	Most Indonesian IPO research ended in 2019 or earlier	There has been no research examining the IDX IPOs during the post-pandemic period of 2022-2025.	Data on 190 IPOs for the period Jan 2022 – Mar 2025

Gap Dimension	Current State of Literature	Identified Gaps	Contribution of This Research
Distribution analysis	Generally only reports the mean return; uses parametric tests without verifying the normality assumption	Lack of robust median and distribution analysis for non-normal data	Comprehensive analysis of mean, median, Friedman test, Wilcoxon
Multi-horizon	Most only analyze the initial return (1 day) or a maximum return of 6 months.	The rarity of performance analysis on 5 time horizons at once (1D, 1W, 1M, 6M, 1Y)	Returns on 5 time horizons with comparison test
Composite proxy	Information asymmetry proxies are generally used one at a time as separate variables.	There are no Indonesian studies that construct an integrated composite index of information asymmetry.	AI Index based on Min-Max normalization of three proxies

Conceptual Framework

Based on the theoretical synthesis and identification of research gaps that have been carried out, this study builds a conceptual framework that links information asymmetry variables with IPO performance at various time horizons, by considering market conditions as control variables.

Table 3. Conceptual Framework of Variable Relationships and Directional Predictions

Independent Variables	Proxy / Construct	Prediction vs 1D	Prediction vs 1Y	Basic theory
IPO Price (Ln)	Information asymmetry (inversion)	(-) *	(-) or (+)	Rock (1986); Beatty & Ritter (1986)
Funds Raised (Ln)	Visibility & scale of emissions	(-) or (+)	(+) *	Signaling; Carter et al. (1998)
Number of Underwriters	Reputation & information distribution	(-) *	(+)	Carter & Manaster (1990)
AI Index (composite)	Aggregate information asymmetry	(+)	(-)	Rock (1986) aggregation of three proxies
Market conditions (IHSG)	Hot / cold market	(+)	(-)	Ritter (1991) Market Timing
IPO Year	Macroeconomic control	Varies	Varies	Time fixed effect

This conceptual framework indicates that IPO performance is a function of the interaction between three dimensions of information asymmetry derived from firm characteristics (IPO price), offering scale (funding), and intermediary quality (underwriter) within the context of changing market conditions over time. Theoretical predictions marked with an asterisk (*) are those empirically confirmed in this study, while several other predictions prove to be more complex than those predicted by a single theory.

RESEARCH METHODS

This research is based on a positivistic (post-positivism) paradigm that views socio-economic reality as something that can be observed, measured, and tested empirically through systematic scientific methods (Pretorius, 2024). In this paradigm, knowledge is built through testing hypotheses derived from existing theories, using quantifiable data and analytical procedures that can be replicated by other researchers (Zumitzavan, 2025). This approach aligns with the tradition of empirical research in financial economics, *the* parent discipline of this research (Maksimović &

Evtimov, 2023). The research uses a quantitative approach with a non-experimental research design based on archival data. The data used are secondary data sourced from the official records of the Indonesia Stock Exchange on IPO activity, which is objective and free from collection biases that may arise in survey- or interview-based research.

Population

The population of this study is all companies that conducted an initial public offering (IPO) and listed their shares on the Indonesia Stock Exchange in the period January 2022 to March 2025. The selection of this period was based on the following considerations: (1) the representativeness of post-COVID-19 pandemic market conditions which have unique characteristics compared to the previous period, (2) the availability of complete and verified data for all research variables, and (3) the adequacy of the number of observations to support adequate multivariate statistical analysis.

Sampling Techniques and Selection Criteria

The study used a purposive sampling technique (judgmental sampling) with clear inclusion and exclusion criteria. This technique was chosen because the study population was limited and relatively homogeneous (all were IPOs on the IDX), eliminating the need for probabilistic sampling. All population units that met the criteria were included in the study sample (a census of the eligible population).

Sample Characteristics

The sample consists of 190 IPO companies with the following temporal distribution: 59 companies (31.1%) in 2022, 79 companies (41.6%) in 2023, 41 companies (21.6%) in 2024, and 11 companies (5.8%) in the first quarter of 2025. All segments of the IDX listing board are represented, namely the main board, development board, and acceleration board, so that the sample reflects the heterogeneity of the Indonesian IPO ecosystem in a representative manner (IDX, 2026).

Data Collection Sources and Methods

Data source

The research data is sourced entirely from official secondary data published by the Indonesia Stock Exchange. The data is compiled from official IDX publications that include: (1) a list of listed companies along with their listing dates, IPO prices, and stock codes, (2) the value of funds raised from each public offering, (3) the names and number of underwriters for each IPO, and (4) closing stock price data on various trading days post-listing used to calculate returns over various time horizons. This data is available in a verified dataset file and can be traced to its original source.

Data Collection and Verification Procedures

Data verification was performed through two mechanisms. First, cross-checking the return data available in the dataset with an independent calculation using historical price data for a random sample of 10% of the total observations. Second, manual identification and checking of extreme values (outliers) that could potentially represent data input errors. Outliers verified as valid data (not errors) were retained in the analysis with transparent reporting of their presence and impact on the results.

Research Hypothesis

Based on the theoretical foundation and conceptual framework that has been built, and referring to the problem formulation set out in Chapter I, this study formulates the following hypotheses:

H1: Underpricing Hypothesis

The average initial return (first-day trading return) of IPO shares on the Indonesia Stock Exchange (IDX) for the 2022-2025 period is statistically significantly different from zero and

positive, reflecting the existence of systematic underpricing. [Basis: Rock (1986); Beatty & Ritter (1986)]

H2: Horizon Difference Hypothesis

There is a statistically significant difference in the distribution of IPO stock performance across the different time horizons, with a pattern of higher short-term performance compared to long-term performance. [Basis: Ritter (1991); Loughran & Ritter (1995)]

H3 IPO Price Hypothesis

IPO offering price has a negative and significant effect on initial returns: the higher the IPO price (indicating lower information asymmetry), the less underpricing occurs. [Basis: Rock (1986); Beatty & Ritter (1986)]

H4: Fund Scale Hypothesis

The scale of funds raised through an IPO significantly impacts performance: negatively impacting initial returns (larger IPOs = lower asymmetry) and positively impacting long-term returns (larger IPOs = better fundamental quality). [Basis: Signaling Theory; Allen & Faulhaber (1989)]

H5: Underwriter Reputation Hypothesis

The number of underwriters in a consortium negatively impacts initial returns (wider consortium = lower information asymmetry) and positively impacts long-term performance (stronger quality certification). [Basis: Carter & Manaster (1990); Megginson & Weiss (1991)]

H6: Long-Run Underperformance Hypothesis

The average 1-year post-listing return of IPO shares on the IDX is statistically negative, reflecting the long-run underperformance phenomenon that has been documented in the international literature. [Basis: Ritter (1991); Loughran & Ritter (1995)]

Operational Definition and Measurement of Variables

Dependent Variable

Table 4. Operationalization of Dependent Variables

Symbol	Variable Name	Formula & Description	Scale	Hypothesis
IR / R1D	Initial Return (1 Day Return)	IR = (P1 - P0) / P0 | P1 = closing price of the first trading day. Measures underpricing. Positive = underpriced.	Ratio	H1, H3, H4, H5
R1W	Return 1 Week	R1W = (P5 - P0) / P0 | P5 = closing price of the 5th trading day (approx. 1 calendar week).	Ratio	H2
R1M	1 Month Return	R1M = (P20 - P0) / P0 | P20 = closing price of the 20th trading day (approx. 1 calendar month).	Ratio	H2
R6M	6 Month Return	R6M = (P120 - P0) / P0 | P120 = closing price approximately 6 months after listing.	Ratio	H2, H6
R1Y	1 Year Return	R1Y = (P240 - P0) / P0 | P240 = closing price approximately 1 year after listing. n=172.	Ratio	H2, H4, H5, H6

Note: All dependent variables are expressed in decimals. P0 = IPO offering price; Pt = closing price on trading day t.

Independent Variables

Table 5. Operationalization of Independent Variables

Symbol	Variable Name	Measurement & Justification	Scale	VIF	Hypothesis
Ln_P0	Ln IPO Price	Ln(IPO offering price in Rp). Information asymmetry proxy: low price = limited information = high asymmetry. Ln transformation because the price distribution is highly right-skewed (skewness = 6.35).	Ratio	2.24	H3
Ln_Dana	Ln Funds Collected	Ln(total funds raised by IPO in millions of IDR). Proxy for visibility and scale. Ln transformation due to extreme outliers (GOTO IDR 13.7 T vs median IDR 100.9 M).	Ratio	3.39	H4
N_UW	Number of Underwriters	The number of underwriters in the consortium. Calculated from the number of names separated by a semicolon (;) in the underwriter column. Min=1, Max=13.	Ratio	1.89	H5
AI_Idx	AI Index (Composite)	Composite information asymmetry index = average of three normalized proxies: (1-MinMax(P0)) + (1-MinMax(Dana)) + (1-MinMax(N_UW)) divided by 3. Range 0-1.	Ratio		Robustness

Note. The Ln (Natural Logic) transformation is used to correct for extreme right-skewed distributions. VIF = Variance Inflation Factor of the main regression model.

Control Variables

Table 6. Operationalization of Control Variables

Symbol	Variable Name	Measurement	Scale	Justification
D_2023	Dummy Year 2023	D_2023 = 1 if the IPO is in 2023; 0 = other. Reference: 2022.	Nominal	Control of macroeconomic conditions differs between years
D_2024	Dummy Year 2024	D_2024 = 1 if the IPO is conducted in 2024; 0 = other.	Nominal	Control the 2024 interest rate hike cycle
D_Q2	Q2 Dummy	D_Q2 = 1 if the IPO is conducted in Q2 (Apr-Jun); 0 = other. Reference: Q1.	Nominal	Controlling for seasonal effects of IPO activity
D_Q3	Q3 Dummy	D_Q3 = 1 if IPO is conducted in Q3 (Jul-Sep); 0 = others.	Nominal	Q3 BEI is historically the peak IPO season
D_Q4	4th Quarter Dummy	D_Q4 = 1 if the IPO is conducted in Q4 (Oct-Dec); 0 = other.	Nominal	Control the end-of-year window dressing effect

Note. All control variables are coded as dummy variables with a specified reference category.

AI Construction (Asymmetry Information) Index

The AI Index is a methodological contribution of this research in the form of a composite index of information asymmetry that integrates three proxies into a single scalar measure. Construction is carried out in three stages:

1. Normalize the Min-Max of each proxy to the range [0,1] using the formula: *MinMax(x) = (x - x_min) / (x_max - x_min)* , so that the lowest value in the sample becomes 0 and the highest value becomes 1.
2. Inverse normalized values for IPO price and funds raised are used because these two variables are negatively correlated with information asymmetry: *AI_price = 1 - MinMax(IPO_price); AI_funds = 1 - MinMax(Funds); AI_uw = 1 - MinMax(N_UW).*
3. Average of three components with equal weight: *AI_Index = (AI_price + AI_funds + AI_uw/3.*

AI_Index values close to 1 = very high asymmetry; close to 0 = low asymmetry . In this study's sample, the AI Index ranged from 0.317 (the largest GOTO IPO with 13 underwriters) to 0.999 (the smallest EURO IPO with a price of IDR 70 and 1 underwriter). The AI Index was used as an alternative variable in a sensitivity analysis to test whether the regression results were consistent when the three proxies were combined.

Analysis Model

Main OLS Regression Model

To test hypotheses H3, H4, and H5, this study uses a cross-sectional Ordinary Least Squares (OLS) regression model. Two main models are estimated:

Model 1	$\mathbf{IR\_i = \alpha + \beta1 \cdot Ln\_P0 + \beta2 \cdot Ln\_Dana + \beta3 \cdot N\_UW + \beta4 \cdot D2023 + \beta5 \cdot D2024 + \beta6 \cdot DQ2 + \beta7 \cdot DQ3 + \beta8 \cdot DQ4 + \varepsilon\_i}$	Dependent: Initial Return (Return 1D); n=190
Model 2	$\mathbf{R1Y\_i = \alpha + \beta1 \cdot Ln\_P0 + \beta2 \cdot Ln\_Dana + \beta3 \cdot N\_UW + \beta4 \cdot D2023 + \beta5 \cdot D2024 + \beta6 \cdot DQ2 + \beta7 \cdot DQ3 + \beta8 \cdot DQ4 + \varepsilon\_i}$	Dependent: 1-Year Return; n=172

The selection of OLS is based on its superiority in producing the Best Linear Unbiased (BLUE) estimator under the Gauss-Markov assumption, ease of coefficient interpretation, and comparability with the IPO literature that predominantly uses this method. Although the return data are not normally distributed, with n=190 and n=172, respectively, the central limit theorem justifies that inferences based on the t- and F-distributions remain asymptotically valid.

Alternative Model: AI Index

As a sensitivity analysis, Model 3 replaces the three separate information asymmetry proxies with the constructed AI Index:

Model 3	$\mathbf{IR\_i = \alpha + \beta1 \cdot AI\_Index + \beta2 \cdot D2023 + \beta3 \cdot D2024 + \beta4 \cdot DQ2 + \beta5 \cdot DQ3 + \beta6 \cdot DQ4 + \varepsilon\_i}$	Sensitivity: composite proxy vs separate proxy

Consistency in direction and significance between Models 1 and 3 provides additional confidence in the validity of the findings. If the results are consistent, this indicates that the findings are not sensitive to the chosen method of measuring information asymmetry.

Data Analysis Procedure

Stage 1: Descriptive Statistics and Data Exploration

The analysis begins with comprehensive descriptive statistics for all research variables, including: mean, median, standard deviation, minimum, maximum, skewness, and kurtosis (Bulman & Osborn, 1989) (Smith, 2015). For the return variable, the analysis is complemented by distribution visualizations (histograms and box plots) to identify the distribution shape, the presence of outliers, and the degree of non-normality. This exploratory stage is crucial for determining the suitability of the statistical methods to be used in the subsequent stages.

Stage 2: Normality Test

The normality of the distribution of each variable was tested using the Shapiro-Wilk test, which is more appropriate for sample sizes below 2,000 and has better statistical power than the Kolmogorov-Smirnov test for medium samples (Moral De La Rubia, 2025). Decision criteria: if the p-value < 0.05, the distribution of the variable is significantly different from the normal distribution, which implies the use of non-parametric methods for testing the relevant hypothesis (Abdi, 2023).

Stage 3: Hypothesis Testing

Table 7. Summary of Hypothesis Testing Methods

H	Hypothesis	Test Method	Decision Criteria	Software
H1	IR > 0 (underpricing)	One-sample t-test (one-tailed); or Wilcoxon signed-rank test if not normal	t > t-critical; p < 0.05 (one-tailed)	SPSS / Python
H2	Performance differences between horizons	Friedman test (non-parametric, k-sample repeated measures)	chi2 significant; post-hoc Wilcoxon with Bonferroni correction (alpha = 0.005)	SPSS / Python
H3	Ln_P0 -> IR negative	OLS regression coefficients of Model 1; one-tailed t-test	beta(Ln_P0) < 0 and p < 0.05	SPSS / Python statsmodels
H4	Ln_Dana -> IR & R1Y positive	OLS regression coefficients of Models 1 & 2	beta(Ln_Dana) sig on one of the models	SPSS / Python statsmodels
H5	N_UW -> IR negative, R1Y positive	OLS regression coefficients of Models 1 & 2	beta(N_UW) < 0 in Model 1 sig	SPSS / Python statsmodels
H6	R1Y < 0 (long-run underperformance)	One-sample t-test; analysis of median and distribution	p < 0.05 (one-tailed) AND/OR median < 0	SPSS / Python

Note: The selection of the method is based on the results of the normality test and the measurement scale of the variables.

RESEARCH RESULTS AND DISCUSSION

Research Sample Overview

Of the 190 issuers studied, 172 companies had complete one-year return data, while 18 companies had not yet reached their full trading year, so one-year return data was unavailable. The temporal distribution of the sample shows very high IPO activity in 2022 and 2023 (79 companies, or 41.6% of the total sample, respectively), followed by a significant decline in 2024 (29 companies, 15.3%) and 2025 (3 companies, 1.6% through the first quarter).

Characteristically, the IPO prices in the sample varied widely, ranging from Rp70 per share (EURO) to Rp5,550 per share (AADI), with a median of Rp135 and a mean of Rp295.9. The high coefficient of variation and skewness value of 6.35 indicate a highly right-skewed price distribution, dominated by small-scale, low-priced IPOs. A total of 65.3% of the sample fell into the mid-price group (Rp101-500), 24.7% into the low-price group (less than or equal to Rp100), and only 10.0% into the high-price group (more than Rp500).

Descriptive Statistics

Table 7 presents descriptive statistics for all study variables. Several important patterns can be identified from these descriptive results.

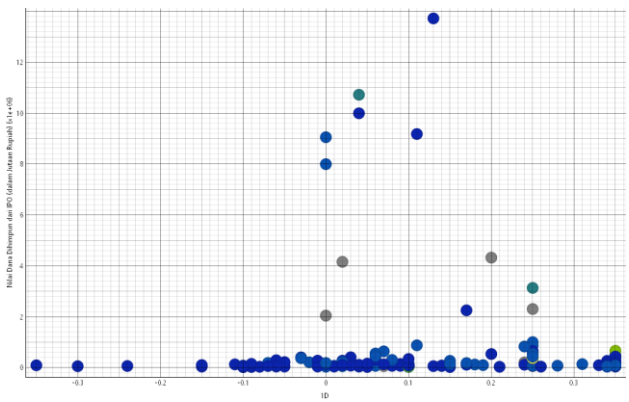
Table 8. Descriptive Statistics of Research Variables

Variables	n	Min	Max	Mean	Median	Elementary School	Skew.	Kurt.
Return 1D (Initial Return)	190	-0.350	0.350	0.1593	0.170	0.1703	-0.44	-0.81
Return 1W	190	-0.560	2,800	0.3409	0.145	0.6766	1.66	2.67
Return 1M	190	-0.720	10,850	0.4668	0.115	1,2779	4.29	26.28
Return 6M	190	-0.780	15,250	0.3805	-0.050	1.7795	5.14	33.22
Return 1Y	172	-0.920	30,140	0.4401	-0.225	2,9914	7.20	62.33
IPO Price (Rp)	190	70	5,550	295.9	135	568.1	6.35	49.09
Ln IPO Price	190	4,248	8,622	5,197	4,905	0.776	1.88	3.75
Funds Raised (Million Rp)	190	20,250	13,727,889	566,026	100,937	1,844,788	5.06	26.55
Ln Dana	190	9,916	16,435	11,831	11,522	1,277	1.56	2.79
Number of Underwriters	190	1	13	1,816	1	1,634	3.75	17.93
AI Index	190	0.317	1,000	0.950	0.987	0.100	-3.91	16.70

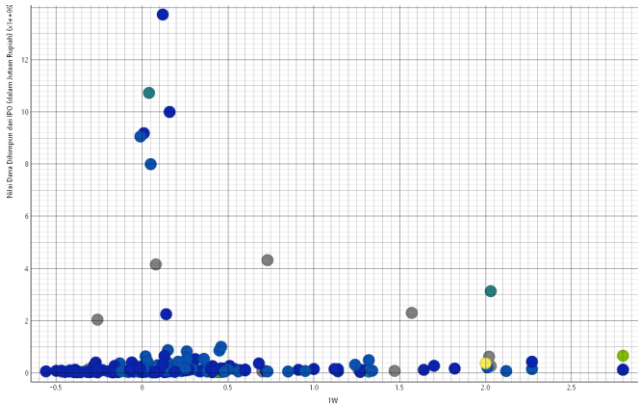
Note: Returns are expressed in decimal form. n = 190 for all variables except Return 1Y (n = 172). Skewness and kurtosis were calculated using Fisher's method.

Several prominent descriptive findings are as follows. First, the average initial return (1-day return) of 15.93% visually indicates substantial underpricing, although statistical confirmation through inferential testing is required. Second, there is a striking divergence between the mean and median values for long-term return variables, particularly for the 1-Year Return, where the mean reaches 44.01% but the median is only -22.50%. This divergence indicates a highly right-skewed distribution and the presence of extreme positive outliers that push the average value far above the distributionally representative value. Third, all return variables exhibit very high kurtosis values, especially the 1-Year Return (kurtosis = 62.33), confirming that the data are not normally distributed and has implications for selecting appropriate statistical methods. The following figure shows the returns for each period 1D, 1W, 1M, 1M and 1Y.

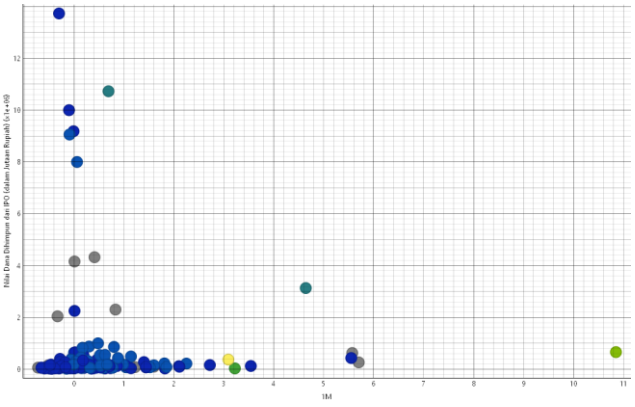
a. Return 1D



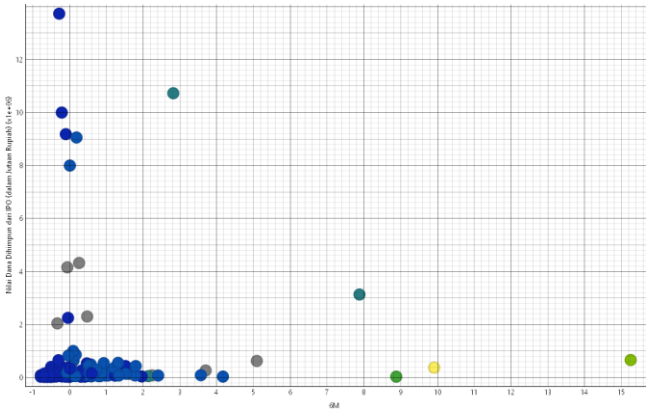
b. Return 1W



c. Return 1M



d. Return 6M



e. Return 1Y

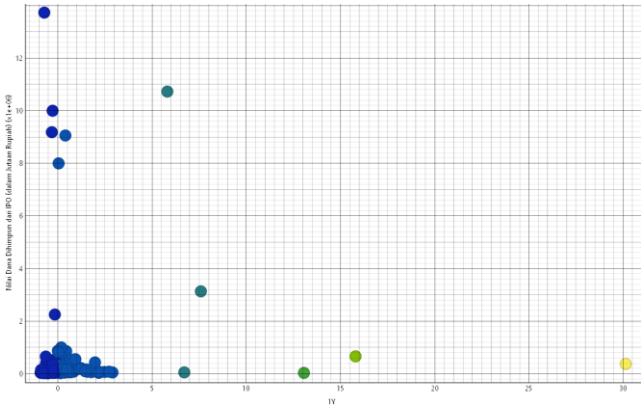


Figure 1. Scatter Plot Return

Normality Test and Analysis Prerequisites

The normality test using Shapiro-Wilk (chosen because the sample size n < 2000 provides better power than Kolmogorov-Smirnov) shows that all return variables significantly deviate from the normal distribution ($p < 0.001$ for all variables). Return 1D obtained a W value = 0.898 and Return 1Y obtained W = 0.332. The very low W value in Return 1Y confirms a very non-normal distribution due to extreme outliers.

The implication of this distributional abnormality is the use of non-parametric statistics for comparative hypothesis testing, specifically the Friedman test (H2) and the Wilcoxon Signed-Rank test as post-hoc analysis. Meanwhile, OLS regression analysis is still performed because the central limit theorem justifies that with n = 190, the OLS estimator is still consistent and asymptotically normal even though the residuals are not perfectly normal.

Hypothesis Testing and Discussion

Hypothesis 1: Underpricing Phenomenon in IDX IPOs 2022-2025

The first hypothesis states that the average initial return (IR) is significantly greater than zero, reflecting the underpricing phenomenon in IPOs on the IDX. The test was conducted using a one-sample t-test with a test value of 0. The t-test results show a value of $t(189) = 12.90$ with a p-value <0.001 (two-tailed), and $p < 0.001$ for one-tailed testing. The mean initial return value of 15.93% with a 95% confidence interval [13.51%; 18.35%] convincingly confirms that the average IR of the IPO population on the IDX is positively significantly different from zero. Thus, H1 is accepted.

These findings are consistent with and even exceed the average underpricing reported in the global literature. (Loughran & Ritter, 2002) reported an average underpricing of approximately

18.7% for the United States market over a long period, while (Ljungqvist, 2007) in his comprehensive survey found a global average underpricing of 15-20%. IPO underpricing is a worldwide phenomenon. From 1998 through 2018, the average IPO is underpriced by 34.9%, with the highest first-day return of 482.4% (Boulton, 2022). Chinese firms are among those experiencing the highest IPO underpricing in the world (Tian, 2011) (Joshipura et al., 2023). The IDX underpricing of 15.93% is moderate compared to other emerging markets, but remains substantial compared to developed markets.

Theoretically, these findings support Rock's Winner's Curse Model (1986), which predicts that IPO issuers must systematically price their shares below intrinsic value to compensate uninformed investors for the adverse selection risk they bear (Rock, 1986). In the context of the Indonesian capital market, this phenomenon is even more relevant given the highly dominant proportion of retail investors. As of the end of 2023, more than 97% of investment accounts on the IDX belonged to individual investors, structurally creating a significant information asymmetry between issuers and investors. In addition, this finding is also consistent with the Signaling Theory proposed by Allen and Faulhaber (1989), where high-quality companies deliberately set low IPO prices as a quality signal that cannot be imitated by low-quality companies, with the hope of conducting a seasoned equity offering at a higher price in the future (Allen & Faulhaber, 1989).

Hypothesis 2: Performance Differences Across Time Horizons

The second hypothesis tests whether there is a significant difference in IPO stock performance across different observation time horizons, with the prediction that short-term performance will be better than long-term performance. The Friedman test (chosen because the data are not normally distributed and are repeated measurements on the same subjects) yields a chi-square(4) = 79.84 with $p < 0.001$, indicating a highly significant difference in return distribution across the five time horizons. This confirms H2 that the pattern of IPO stock performance is not uniform over time.

More informative than the mean is the median return pattern, which more accurately depicts the central tendency of the distribution under non-normal data conditions: median 1D Return = 15.00%; median 1W Return = 14.50%; median 1M Return = 11.50%; median 6M Return = -6.50%; and median 1Y Return = -22.50%. This pattern clearly shows a consistent downward trajectory, peaking in the very short term (the first trading day) and then consistently declining towards negative performance at 6 months and 1 year post-listing.

Table 8. Return Performance Across Time Horizons (n = 172 complete cases)

Horizon	n	Mean	Median	Elementary School	Wilcoxon vs 1D	Sig.
1D Return	172	0.1567	0.1500	0.1737		
Return 1W	172	0.3224	0.1450	0.6608		
Return 1M	172	0.4238	0.1150	1,2015		
Return 6M	172	0.3536	-0.0650	1,8011	7,179.0	0.023*
Return 1Y	172	0.4401	-0.2250	2,9914	4,728.0	< 0.001**

Note. Friedman chi-square(4) test = 79.84, $p < 0.001$. Post-hoc Wilcoxon with Bonferroni correction (alpha = 0.005). ** $p < 0.001$.

These findings are highly consistent with the long-run underperformance hypothesis, which has been widely documented in the literature. Ritter (1991), in a seminal study using a sample of 1,526 US IPOs from 1975 to 1984, found that investors who purchased IPO shares at the first-day closing price and held their positions for three years experienced 29% lower performance than a

control group of similar firms (Ritter, 1991). Loughran and Ritter (1995) extended the analysis horizon and found that newly IPO firms consistently underperformed for five years after listing (Loughran & Ritter, 1995).

This phenomenon is explained through several alternative theories. First, the Investor Sentiment Hypothesis (Ritter, 1991) states that during hot market conditions, companies exploit excessive investor optimism to launch IPOs at excessively high valuations, resulting in their long-term performance failing to maintain these price expectations. Second, the Impresario Hypothesis (Shiller, 1990) argues that underwriters deliberately create underpricing to generate investor enthusiasm, which then leads to overvaluation and price record correction in the medium to long term.

Hypothesis 3: The Effect of IPO Price on Initial Return

The third hypothesis predicts that a higher IPO price, as a proxy for lower levels of information asymmetry, will have a negative and significant effect on initial returns. The OLS regression results with the dependent variable Return 1D show a coefficient of Ln_IPO_Price of -0.064 (SE = 0.023, t = -2.752, p = 0.007, 95% CI [-0.109; -0.018]). This coefficient is significant at the 1% confidence level and its direction is in line with theoretical predictions, thus H3 is accepted. The substantive interpretation of this coefficient is as follows: ceteris paribus, a 1% increase in IPO price is associated with a 0.064 percentage point decrease in initial return. Or, more concretely, a one-level difference in IPO price (for example, from Rp100 to Rp200, equivalent to a 0.693 increase in Ln) is associated with a decrease in initial return of approximately 4.4 percentage points.

This finding aligns with Rock's (1986) prediction that the level of underpricing is inversely related to the quality of information available in the market (Rock, 1986). Stocks with low IPO prices are generally smaller, less well-known companies with limited track records conditions that inherently create greater information asymmetry between informed and uninformed investors. To compensate for the adverse selection losses borne by retail investors, issuers must offer larger discounts, which is reflected in higher initial returns.

Interestingly, the Spearman correlation between Ln_IPO_Price and 1D Return is only -0.065 (insignificant), while in the multivariate regression model the coefficient is significant. This indicates that the effect of IPO price on initial return is only clearly visible after other variables (specifically Ln_Funds and Number_of_Underwriters) are controlled, a finding that demonstrates the importance of multivariate analysis in uncovering partial relationships not visible in simple bivariate analysis.

Hypothesis 4: The Effect of Funds Raised on Returns

The fourth hypothesis is bidirectional: first, that larger IPO funds are associated with smaller initial returns (lower information asymmetry in large IPOs); second, that larger funds are associated with better long-term performance. The results of the 1D Return model show a coefficient of Ln_Fund of +0.054 (SE = 0.017, t = 3.099, p = 0.002, 95% CI [0.019; 0.088]). This value is statistically significant but in the opposite direction to the original prediction of H4: larger funds are associated with higher, not lower, initial returns.

This anomaly can be explained through two mechanisms. First, the visibility and investor demand effect: Large-cap IPOs generally receive significantly greater media and analyst attention, generating more intense investor demand on the first trading day. This high demand drives the price up significantly even though the IPO price has already been sufficiently validated by underwriters. Second, the book-building effect: Large IPOs on the IDX typically undergo a more structured book-building process with the participation of institutional investors, where high oversubscription generates excess demand, driving the market price sharply higher on the first day.

For the 1Y Return model, the Ln_Dana coefficient of +0.703 (SE = 0.320, t = 2.197, p = 0.029) indicates a significant positive effect of the only significant predictor in the long-term model. This is consistent with the prediction of H4 for the long horizon: companies that successfully raise

larger funds generally have more planned expansion projects, better access to capital markets, and the ability to attract high-quality management all contribute to better operational performance and stock prices in the long run.

Hypothesis 5: The Effect of Underwriter Reputation on Returns

The fifth hypothesis predicts that a larger number of underwriters, as a proxy for reputation and underwriting quality, will negatively impact initial returns and positively impact long-term performance. In the 1D Return model, the coefficient of Number_Underwriters is -0.024 (SE = 0.010, t = -2.365, p = 0.019) indicating a significant negative effect; each additional underwriter in the consortium is associated with a 2.4 percentage point decrease in initial returns, after controlling for IPO price and fund size. This finding supports the argument that a larger underwriter consortium reflects a more rigorous due diligence process and broader distribution of information to the market, thereby reducing information asymmetry and thus the need for underpricing discounts.

This interpretation is supported by descriptive statistics showing that 71.6% of the IPOs in the sample used only a single underwriter, indicating that the majority of IPOs on the IDX are relatively small and lack access to strong underwriting consortia. Only very large-scale IPOs like GOTO (13 underwriters) and ADCP (7 underwriters) had truly comprehensive consortia. In the 1Y Return model, the direction of the effect is actually negative (beta = -0.356, p = 0.060), contrary to the prediction of H5 for the long run. This finding is surprising and interesting to discuss. One possible explanation is that IPOs with multiple underwriters tend to be less underpriced, thus limiting the scope for substantial long-term price appreciation. An alternative explanation is that large-scale IPOs with multiple underwriters like GOTO, which experienced a 72% decline in one year, actually exhibited very poor long-term performance, thereby distorting the average relationship.

Hypothesis 6: Long-Run Underperformance

The sixth hypothesis predicts long-run underperformance in BEI IPO stocks, where the average return one year post-listing is statistically negative. The one-sample t-test for 1Y Return yields t(171) = 1.93 with p = 0.055 (two-tailed). Thus, the null hypothesis (average 1Y Return = 0) cannot be rejected at the 5% significance level. The mean 1Y Return of 44.01% is even positive, so in a formal statistical sense, H6 is not proven.

However, this interpretation requires a more in-depth and nuanced analysis. The extreme divergence between the mean (+44.01%) and median (-22.50%) is a strong signal that the 1-year return distribution is highly asymmetric and distorted by a small number of unusually large positive outliers. Identification of outliers reveals several extreme cases: AMMN (PT Amman Mineral Internasional) generated a 1-year return of 481%; EURO (PT Jayamas Medica Industri) 217%; and AADI (PT Adaro Andalan Indonesia) 3,014% (due to its spin-off from the ADRO group with a very low initial valuation). The presence of these outliers pushed the mean well above zero, even though the majority of issuers experienced negative performance.

When the analysis focuses on the median value (which is more robust against outliers), the emerging picture supports the long-run underperformance hypothesis: the median 1Y Return of -22.50% indicates that more than half of the IPO stocks in the sample experienced losses within one year of listing. Similarly, the 6M Return already shows a negative median of -6.50%, indicating that performance deterioration occurred quite early.

This finding is consistent with the international long-run underperformance literature, but with an important caveat related to distribution. Brav and Gompers (1997) showed that long-run IPO underperformance is largely a phenomenon among small firms without venture capital support, a characteristic particularly prominent in this IDX sample, where the majority of IPOs are small-to-medium sized firms (Brav & Gompers, 1997). This finding is also consistent with Loughran and Ritter (1995), who found that investors who buy at the first-day price and hold for 3-5 years experience underperformance compared to the market (Loughran & Ritter, 1995).

OLS Regression Results and Model Implications

Table 4.3 presents the complete results of the OLS regression model estimation for the dependent variables Return 1D (Model 1) and Return 1Y (Model 2). The selection of independent variables is based on the theoretical framework of information asymmetry developed in the previous chapter.

Table 9. OLS Regression Results: Determinants of IPO Performance

Variables	Model 1 (1D)	Model 2 (1Y)	VIF	Hypothesis
Ln IPO Price	-0.064**	-0.007	2.24	H3
	(0.023)	(0.475)		
Ln Funds Collected	+0.054**	+0.703*	3.39	H4
	(0.017)	(0.320)		
Number of Underwriters	-0.024*	-0.356†	1.89	H5
	(0.010)	(0.188)		
D_2023	-0.068*	+0.244	1.29	Control
D_2024	+0.011	-0.314	1.28	Control
D_Q2	+0.047	-0.864	1.27	Control
D_Q3	+0.007	-0.886	1.30	Control
D_Q4	-0.021	-1,042	1.24	Control
Constant	+0.429*	-6,498		
R^2	0.1037	0.0688		
Adjusted R^2	0.0641	0.0231		
F-statistic	2,617**	1.505 (ns)		

Note. Numbers in parentheses are standard errors. Model 1: n = 190, R^2 = 0.104, Adjusted R^2 = 0.064, F(8,181) = 2.617, p = 0.010. Model 2: n = 172, R^2 = 0.069, Adjusted R^2 = 0.023, F(8,163) = 1.505, p = 0.159. ** p < 0.01, * p < 0.05, † p < 0.10.

Several important notes regarding these regression results should be underscored. First, the R^2 values of 10.4% for Model 1 (1D Return) and 6.9% for Model 2 (1Y Return) are relatively low but not surprising in the context of cross-sectional financial research. Fama (1991) and various IPO market researchers note that stock return variations are generally only partially explained by observable fundamental variables, with the remainder being idiosyncratic market noise. A similar study by Ljungqvist and Wilhelm (2003) also obtained comparable R^2s in the 8-15% range for their underpricing determinant model.

Second, all VIF values are below 5 (the highest is Ln_Dana with a VIF of 3.39), confirming that multicollinearity is not a serious problem in this model. Third, the significance of the F value in Model 1 (p = 0.010) confirms that the model as a whole has significant predictive ability for initial returns, although the R^2 is relatively small.

An interesting finding regarding the control variables is the negative and significant coefficient of D_2023 (-0.068, p = 0.014) in Model 1. This means that IPOs conducted in 2023 had an average initial return 6.8 percentage points lower than IPOs in 2022, after controlling for other factors. 2022 was marked by post-pandemic market euphoria and a surge in IPO activity accompanied by high investor enthusiasm, which drove higher initial returns. Meanwhile, in 2023, market conditions normalized more due to rising global interest rates and moderating investor sentiment.

Summary of Findings

Table 10. Summary of Hypothesis Decisions

No.	Hypothesis	Key Results	Decision	Theoretical References
H1	Initial Return > 0 (underpricing)	t(189) = 12.90, p < 0.001, IR = 15.93%	ACCEPTED	Rock (1986)
H2	Short term performance > long term	Friedman chi2(4) = 79.84, p < 0.001; median 1D = +15% vs 1Y = -22.5%	ACCEPTED	Ritter (1991)
H3	High IPO price -> smaller IR	beta = -0.064, t = -2.75, p = 0.007	ACCEPTED	Rock (1986)
H4	Big fund -> small IR & 1Y good	1D: beta = +0.054 p = 0.002 (reverse direction); 1Y: beta = +0.703, p = 0.029	PARTIAL	Signaling Theory
H5	Lots of UW -> small IR & good 1Y	1D: beta = -0.024, p = 0.019; 1Y: beta = -0.356, p = 0.060	PARTIAL	Carter & Manaster (1990)
H6	Long-run underperformance (1Y < 0)	Mean 1Y = +44% (ns, p = 0.055); Median = -22.5% -> majority underperform	MIXED	Loughran & Ritter (1995)

Note. H = accepted; H = rejected; Partial = partially proven. All tests use alpha = 0.05 unless otherwise stated.

CONCLUSION

This study aims to analyze post-IPO stock price performance on the Indonesia Stock Exchange from January 2022 to March 2025 from an information asymmetry perspective, using a sample of 190 companies conducting initial public offerings. Based on a comprehensive series of statistical tests, including the one-sample t-test, the non-parametric Friedman test, multivariate OLS regression analysis, and ANOVA, this study yields the following six main conclusions.

Significant and Persistent Underpricing Phenomenon

The first conclusion is that the underpricing phenomenon is statistically and substantively proven in IDX IPOs during the 2022-2025 period. The average initial return of 15.93% (t(189) = 12.90, p < 0.001, 95% CI [13.51%; 18.35%]) convincingly rejects the null hypothesis that the market does not underprice. This value is consistent with the average global underpricing reported in the international literature and confirms that the IPO pricing mechanism on the IDX still contains a significant systematic discount.

Economically, the 15.93% underpricing means that for every Rp1,000 raised through IPOs in this sample, issuers and existing shareholders gave up an average of Rp159 to new investors in the form of money left on the table. Aggregated across the entire sample, this economic value is highly material and represents a significant inefficiency in the IPO valuation and pricing process in the Indonesian capital market.

Short-Term Appreciation Followed by Long-Term Deterioration

The second conclusion is that IPO stock performance follows a clear and consistent trajectory: strong initial appreciation in the very short term (first day to 1 month), followed by a gradual decline toward negative performance in the medium to long term. This pattern is reflected in the movement of the median return: from +15.00% (1 day), +14.50% (1 week), +11.50% (1 month), declining to -6.50% (6 months), and -22.50% (1 year).

This difference in performance distribution across time horizons proves highly statistically significant through the Friedman test (chi-square(4) = 79.84, p < 0.001) and is confirmed by post-

hoc Wilcoxon tests for all critical pairs (1D vs 1Y: $p < 0.001$). This finding has clear practical implications for investment strategies in IPO stocks: the gains from IPO underpricing are concentrated in the very short term and do not persist over medium to long investment horizons.

Information Asymmetry as the Main Determinant of Initial Return

The third conclusion is that the information asymmetry proxy variables collectively and significantly explain the variation in initial returns across IPOs. The OLS regression model for 1D Return is significant overall ($F(8,181) = 2.617$, $p = 0.010$) with an Adjusted R^2 of 6.41%, and all three information asymmetry proxies show statistically significant coefficients.

IPO price (Ln_IPO_Price) has a significant negative effect on initial returns (beta = -0.064, $p = 0.007$), confirming H3 and consistent with the Rock's Winner's Curse Model prediction that firms with lower information visibility and readability should offer larger discounts. The number of underwriters has a significant negative effect (beta = -0.024, $p = 0.019$), confirming H5 that a broader underwriting consortium reduces information asymmetry and thus reduces the need for underpricing.

An unexpected finding is the significant positive effect of Ln_Dana on initial returns (beta = +0.054, $p = 0.002$), contrary to the prediction of pure information asymmetry. This is interpreted as a manifestation of the demand-side effect: large IPOs attract more and more enthusiastic investors, resulting in over-subscription that drives prices up sharply on the first day regardless of the level of information asymmetry.

Funds Raised as a Predictor of Long-Term Performance

The fourth conclusion is that among all the independent variables tested, only the scale of funds raised (Ln_Funds) proved to be a significant predictor of long-term performance (1Y Return: beta = +0.703, $p = 0.029$). This finding supports H4 for the long-term horizon and is consistent with the argument that companies that successfully raise more funds through IPOs have stronger financial capacity, reputation, and governance to effectively execute their business plans post-listing.

The regression model for 1Y Returns was overall insignificant ($F = 1.505$, $p = 0.159$), reflecting the fact that the very large variation in 1Y returns (SD = 2.99) is largely idiosyncratic and influenced by firm-specific factors not captured by the model variables. The low R^2 (6.9%) is a common characteristic of cross-sectional data-based financial models and does not diminish the validity of the identified partial relationships.

Long-Run Underperformance: Evidenced at the Median Level

The fifth conclusion relates to the long-run underperformance hypothesis. Formal testing using the t-test does not provide strong evidence that the mean 1-Year Return is statistically negative ($t = 1.93$, $p = 0.055$), but rather a positive +44.01%. However, a more in-depth analysis of the distribution reveals a very different picture: the median 1-Year Return of -22.50% indicates that the majority (more than 50%) of IPO stocks in the sample experienced losses within one year of listing.

This mean-median divergence is an artifact of a highly right-skewed return distribution with several extreme positive outliers that distort the mean. Thus, H6 is confirmed at the median level but not at the mean. This finding raises an important methodological caveat: IPO research conclusions that rely solely on the mean can potentially produce an overly optimistic picture of the long-term performance of IPO stocks.

The Effect of 2022 as a Hot Market

The sixth conclusion relates to the findings of the control variables. 2023 produced a significantly lower initial return of 6.8 percentage points compared to 2022 (D_2023: beta = -0.068, $p = 0.014$), after controlling for other factors. This finding indicates that 2022 was a hot market period for IPOs, characterized by high investor enthusiasm post-pandemic, abundant global

liquidity, and supportive market momentum, followed by normalization in 2023 along with tighter interest rate conditions.

RECOMMENDATION

Based on the findings of this study, the following recommendations are formulated for three main stakeholder groups in the Indonesian capital market.

Recommendations for Investors

1. IPO allocation strategy based on investment horizon

Investors are advised to explicitly define their investment horizon before participating in an IPO. For short-term investors (<1 month), IPO participation has the potential to be profitable, with an average return of 15.93% on the first day. However, for long-term investors (>6 months), data shows a negative median return. A strategy of holding IPO shares for the medium to long term requires a highly selective fundamental analysis.

2. IPO scale-based selectivity for long-term performance

Empirical evidence suggests that IPOs with larger funds raised have better long-term performance (beta = +0.703 against 1Y Return). Long-term investors are advised to focus their selection on IPOs with larger issuance scales, which are generally accompanied by more stringent due diligence, stronger underwriting consortia, and more solid post-IPO financial capacity.

3. Caution against low-priced IPOs as a risk indicator

IPOs with very low offering prices (below or equal to IDR 100) tend to have higher initial returns but also worse long-term performance (median 1Y Return = -50%). Investors should be aware that low prices reflect high information asymmetry and fundamental uncertainty, not simply short-term profit opportunities.

4. Diversify IPO portfolio to manage skewed distribution

Given the highly right-skewed distribution of IPO returns (some stocks generate returns in the hundreds of percent while the majority yield negative returns), the optimal IPO investment strategy is to diversify participation across multiple IPOs rather than concentrating capital on one or two. This approach increases the chances of capturing positive outliers while reducing concentration risk.

Recommendations For Issuers And Underwriters

1. Optimization of IPO pricing mechanism

The persistent underpricing rate of 15.93% indicates that the IPO pricing mechanism on the IDX is suboptimal from the issuer's perspective. Issuers and underwriters are advised to consider adopting a more transparent book-building process involving broader institutional investor participation, as well as conducting more intensive roadshows to reduce information asymmetry before final pricing.

2. Multi-party underwriter consortium for mid-sized IPOs

The data shows that 71.6% of IPOs in the sample used only a single underwriter, and the addition of an underwriter to the consortium significantly reduced underpricing (beta = -0.024 per additional underwriter). Issuers with medium-scale IPO plans (IDR 100-500 billion) are strongly advised to establish an underwriting consortium of at least 2-3 securities firms to improve information distribution and price discovery quality.

3. **Concrete and measurable plan for using funds**

Given that Ln_Dana is the only significant predictor of one-year performance, issuers are advised not only to maximize the funds raised, but more importantly, to ensure that the planned use of the funds in the prospectus is concrete, measurable, and oriented towards long-term value

creation. Investors are increasingly sophisticated in distinguishing between IPOs that use funds for productive expansion versus debt refinancing or cashing out existing shareholders.

Recommendations for Regulators (OJK and BEI)

1. Study of a more efficient IPO pricing mechanism

The Financial Services Authority (OJK) and the Indonesia Stock Exchange (IDX) are advised to examine the implementation of alternative IPO pricing mechanisms that have been proven to reduce underpricing in other markets. The Dutch Auction system (used by Google in its 2004 IPO) allows the market to determine prices through competitive investor bids. Direct Listing (Spotify, Slack) eliminates traditional underwriting entirely. A comparative study of these mechanisms within the Indonesian regulatory context could provide important input for IPO policy reform.

2. Strengthening disclosure and investor education requirements

The information asymmetry reflected in high underpricing in small-scale IPOs largely stems from limited public information about the issuers. The Financial Services Authority (OJK) is advised to strengthen minimum disclosure standards in IPO prospectuses, particularly regarding management track records, industry risk analysis, and audited financial projections. Similarly, capital market literacy programs aimed at understanding IPO investment risks need to be strengthened given the dominance of retail investors.

3. Development of a standardized public IPO performance database

The IDX is advised to develop and publish a standardized and publicly accessible database of historical IPO performance, including data on IPO prices, returns over various time horizons, and issue characteristics. Transparency of this historical information will improve investor decision-making, promote issuer and underwriter accountability, and facilitate higher-quality academic research on the Indonesian IPO market.

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