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## Article

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Journal of Risk and Financial Management

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*Suggested Citation:* Yadav, Ajay; Prosad, Jaya Mamta; Sumanjeet Singh (2023) : Pre-IPO financial performance and offer price estimation: Evidence from India, Journal of Risk and Financial Management, ISSN 1911-8074, MDPI, Basel, Vol. 16, Iss. 2, pp. 1-19, <https://doi.org/10.3390/jrfm16020135>

This Version is available at:

<https://hdl.handle.net/10419/275202>

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Article

# Pre-IPO Financial Performance and Offer Price Estimation: Evidence from India

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**Abstract:** The primary focus of this paper is to develop an empirical model to study the relationship between key Financial Performance Indicators and IPO Offer Prices. It seeks to assist Indian IPO investors to make more informed decisions by advancing their knowledge about relevant Pre-IPO Financial Performance Indicators that are effective predictors of Offer Price. The purpose of this study is to provide all the stakeholders with an approach to evaluate the Offer Price of IPOs. This will help the stakeholders to overcome pricing anomalies. The companies listed in the National Stock Exchange of India between the financial years 2015–2016 to 2020–2021 are taken as the sample of the study. The secondary data are analyzed by constructing a multiple linear regression model. This study uses a range of fundamental factors related to financial performance in a single framework to demonstrate that an IPO Offer Price can be assessed by its Pre-IPO Financial Performance. The findings of this study validate the objectives of the model constructed. This research shows that the Pre-IPO Financial Performance has an influential role in explaining the IPO offering price. The results of the study show that variables such as Net Asset Value (NAV), Return on Assets (ROA), Profit after Tax (PAT), and Return on Net Worth (RONW) have a substantial impact on IPO Offering Price. The findings of the research will assist IPO issuers in pricing their offerings better and more competitively. Furthermore, this study will also minimize the gap between offering and listing prices to prevent speculative failure. The study will help investors with minimal resources to evaluate the value of any IPO issue. An IPO's value can be fairly estimated, and investors can decide whether the issue is worth investing in or not.

**Keywords:** IPO; offer price; Financial Performance Indicators

**JEL Classification:** G10; G11; G14



**Citation:** Yadav, Ajay, Jaya Mamta Prosad, and Sumanjeet Singh. 2023. Pre-IPO Financial Performance and Offer Price Estimation: Evidence from India. *Journal of Risk and Financial Management* 16: 135. <https://doi.org/10.3390/jrfm16020135>

Academic Editors: Shigeyuki Hamori and Ștefan Cristian Gherghina

Received: 24 November 2022

Revised: 8 February 2023

Accepted: 10 February 2023

Published: 17 February 2023



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## 1. Introduction

An Initial Public Offering (IPO) is a process through which a private company becomes a public enterprise by listing on the stock exchange. Before a company becomes public, it engages with an investment bank that performs the role of the underwriter and assesses the value of the company. The investment bank comes up with an underwriting agreement and manages the IPO process of the company. The Securities and Exchange Board of India (SEBI) approves the IPO after verifying the accuracy of the information provided. Investment in an IPO can be beneficial if a company has the potential to grow. On the other hand, investing in an IPO can be risky because it involves serious risks. Therefore, predisposing factors that are crucial should be considered before making an investment decision. It should be noted that IPOs in India are characterized by uncertainty. IPOs are considered as the best source for Indian companies to meet their funding requirements. Additionally, IPOs attract various classes of investors because they can generate substantial returns. India witnessed a substantial increase in IPOs in 2021. Between 2021 and 2022, Indian IPO activity increased by 314 % in terms of proceeds. Innovative technical start-ups, a favorable interest rate environment, a strong economy, and industrial growth are

key factors that have fueled the IPO market in India. Retail investors are more likely to invest in public offerings when they perceive a positive return (Kaustia and Knüpfer 2008; Chiang et al. 2009; Dhandayuthapani and Ravindar 2019). There is both reward and risk in IPO investments. An investment could bring unexpectedly high returns. However, it could bring loss due to the risks associated with it. Institutional investors can tolerate investment risks to some extent, but retail investors cannot take up high risks. Therefore, investing in an IPO without proper knowledge and analysis could become a risky affair. Retail investors are significantly influenced by institutional investors. The transactions of institutional investors significantly affect the dynamics of supply and demand for securities. Individual investors aim to emulate institutional investors in order to succeed because they have a lot of clout in investing. However, investment experts do not recommend this. Ordinary investors should be prudent while considering whether or not they should invest in IPOs (Chen et al. 2017; Ormiston et al. 2015).

A firm's performance and the IPO's intrinsic value may provide a more accurate assessment of risks and returns. The IPO's intrinsic value reflects the true worth of a firm, and it assists in determining whether or not a prospective investor would receive a return from his investment. There are several approaches for determining the intrinsic value of an IPO stock. Investors in IPOs consider the offering price as a benchmark for determining the inherent value of a stock (Shenoy and Kannan 2018). Investors also examine a firm's financials before investing in an IPO. This is because a firm's financial performance plays a significant role in assessing the IPO's value and prospective returns (Shehzad and Ismail 2014).

It is difficult to ascertain the risks and returns of a company when it is listed on the stock exchange for the first time in the primary market, thus making the investment decision for the investors challenging (Cacheche et al. 2015; Clarke et al. 2016). The confusion among investors grows more when multiple companies simultaneously offer their securities. It is important to mention that there is no standard method for investors to evaluate the offer price. This forces IPO investors and issuers to use different methods to estimate the offer price and the true worth of an IPO. In addition, depending on the assessment methods adopted, the investors receive varied returns for their investments. The lack of an accurate method to evaluate the true value of an IPO increases the chance of investors losing money. It is also possible that on the day when the IPO is listed, the list price could differ largely from the offer price. Thus, this gives rise to pricing anomalies. Investors and issuers of IPO can suffer adverse consequences because of this. The disparity between the offering price and the listing price indicates that there are a lot of unexplained financial variables that determine the offering price. The studies conducted by (Kraus and Strömsten 2012; Bhabra and Pettway 2003) illustrate that investors can figure out mispriced IPOs and make wiser investment decisions by thoroughly analyzing the financial information provided by RHP.

Several research studies have been conducted to understand IPO offer prices. However, these studies have examined only a few limited factors based on non-financial data and qualitative information. So far only a few research studies have been conducted on the relationship between IPO Pricing and Financial Performance Indicators in the Indian context. The existing research works do not provide an accurate method for investors to assess offering prices based on a specific set of financial information. Therefore, IPO investors constantly seek out credible research sources and methods that can be independently verified to ascertain the value of the IPO (Choudhary 2017; Reddy and Hridhya 2020). This has motivated us to perform an in-depth investigation to develop a verifiable approach that can be employed specifically to assess the offering price of IPO in the light of certain performance indicators.

The study provides an empirical framework to assess the offer price of Indian IPOs using key financial performance indicators. The present study confirms that an IPO offer price is influenced by its Pre-IPO financial performance. The result of the study reveals that Net Asset Value, Return on Assets, Profit after Tax, and Return on Net Worth all have a substantial impact on the IPO Offer Price. They have combined predictive potential in determining the Offer Price of an IPO. This research offers significant relevance for

both IPO issuers and investors, particularly the smaller investors with lesser means and skills. The findings of this research will contribute to IPO issuers in pricing their offerings competitively and reduce speculative failure by reducing the disparity between offering and listing prices. This research will also enable investors to assess the value of IPOs. Investors will have a better understanding of IPO pricing, which will enable them to make more informed investment decisions.

## 2. Literature Review and Rationale of the Present Study

### 2.1. Relevancy of Financial Elements and IPO Offer Price Estimation

Hove et al. (2020) showed that return on investment has a significant influence on a stock's price. ROA, ROE, and EPS have negligible influence on the price of stock but they could also have an adverse effect. Firth and Rui (2008); Halonen et al. (2013); Narullia and Subroto (2018); Barniv and Myring (2006) highlighted that composite earnings are one of the most influential factors affecting IPO pricing in developing markets. Hedau (2016) studied the relationship of IPO pricing in relation to accounting and market-related factors. Hedau demonstrated that issue size, profitability, operational cash, leverage, and sales of a company influence the IPO offer price. A study conducted by Brau and Fawcett (2006) showed that accounting indicators of operational efficiency favorably influence IPO pricing. Shenoy and Kannan (2018) studied a sample of BSE listed IPOs from 2003 to 2013. Their findings showed that financial information positively influences IPO stock pricing. Ong et al. (2020) in their study demonstrated that leverage value has a negative influence on IPO offer price. The impact of price book value on share prices only marginally impacts stock pricing (Rusdiyanto et al. 2021; Asif et al. 2016). Aggarwal et al. (2009) showed that financial and signaling factors have an influence on IPO offer prices. Sahoo and Rajib (2012) evidently showed that the offering price-to-earnings ratio of an IPO influences its pricing. In addition, studies conducted by (Francis and Schipper 1999; Scott 2003; Ozlen 2014; Sahni and Mehendiratta 2013; Klein 1996; Purnanandam and Swaminathan 2004; Khan and Amanullah 2012; and Andriantomo and Yudianti 2013) have examined the relevance of accounting and financial data on IPO pricing and share prices. These studies established that there is a significant relationship between them.

### 2.2. Financial Information and Share Price Movements in Secondary Market

Bankole and Ukolobi (2020) studied the relationship between RONW and Share Price. The study revealed that there is a link between the price of a share and a firm's size. Fraz and Hassan (2017) in their study concluded that pricing fluctuations in large corporations have an impact on market synchronicity. Asif et al. (2016) found that stock prices have a substantial correlation with the macro-economic variables. Tiron-Tudor and Achim (2019) illustrated that accounting excellence has a positive effect on the share price. Ohlson (1995) showed that accounting data have an impact on a stock's price. Canbaş et al. (2007) analyzed the relationship between organizational attributes and share price for non-financial ISE firms. The study found that the size of a firm, book leverage, and earnings per share have a significant influence on share pricing. Kousenidis et al. (2014) in their study showed that there is a negative relation between conservative ideology and future stock price crash risk. Yu and Huang (2005); Glezakos et al. (2012) investigated the impact of specific accounting data on stock prices. They explored the relationship between financial information and stock prices, and showed that certain accounting data affect stock prices. Ande and Yoewono (2018); Agostino et al. (2011); Nooney and Durrani (2016); Ball and Brown (1968); Tambun et al. (2018); and Viet Ha et al. (2018) highlighted that a share price is influenced by several financial variables such as the scope to generate profit, the ease with which assets may be converted quickly into cash, solvency, and earnings. The prospect of a positive return on investment makes retail investors more likely to invest in public offerings.

### 2.3. Offering Value and Pre-IPO Financials: Investors' Rationale

[Dolvin and Pyles \(2007\)](#) highlighted that sadness and increased sensitivity to risks causes revisions in the offer price. This is a common phenomenon in winter when investors' sentiment becomes more negative. [Ljungqvist et al. \(2006\)](#) demonstrated that hot IPO markets are associated with a group of investors who are "irrational" in the sense that they have profuse expectations for future performance. [Singh \(2012\)](#) posited that a company's financials should be considered by investors before making any decisions. [Agarwal et al. \(2008\)](#) showed that the investors' overconfidence and pessimism in response to the information based on IPO's potential are what primarily drive investors' demand for IPOs.

### 2.4. Valuation Models and IPO Share Price Determination

[Bünyamin ER \(2012\)](#) showed that offering prices evaluated through the DCF technique has a significant difference in IPO stock offering prices. [Roosenboom \(2010\)](#) studied peer group multiple valuations for pricing IPO shares. The researcher also concluded that DCF and dividend discount models are frequently used in the United States of America. [Cogliati et al. \(2011\)](#) examined the valuation of firms prior to their initial public offerings. They also argued that IPO pricing reflects the potential growth of a company. The price-earnings multiples provided in Chinese IPO prospectuses by management were investigated by [Firth et al. \(2008\)](#) for their relevance to price. According to the researchers, the price-earnings multiples of IPO firms have a major impact on the explanation of IPO price formation in developing markets. Using market-based discounted cash flow valuations and P/E multiples, [Berkman et al. \(2000\)](#) found that Market-based DCF valuations and P/E multiples create less valuation errors than industry-specific approaches.

[Purnanandam and Swaminathan \(2004\)](#); [Houston et al. \(2006\)](#); and [Kim and Ritter \(1999\)](#) examined the relative valuation of IPOs by considering positive income and other value drivers prior to IPO. [Avci \(2021\)](#) assessed whether Turkish IPOs are overpriced by comparing the P/V ratios with that of their peers. The study showed that Turkish IPOs were not overvalued by comparing their P/V ratio to those of their industry counterparts. [Olga Ferraro \(2020\)](#) claimed that the DCF, Dividend Discount Model, Economic Value Added, and Price to Earnings Multiples are the most common IPO valuation methodologies used to estimate the share price.

### 2.5. Theoretical Framework

Research studies cited above indicate that many scholarly works have focused on IPO pricing. [Tambun et al. \(2018\)](#) made a notable contribution highlighting that revenue variances are useful in predicting the accuracy of a rising stock market. The study showed that there is a link between Pre-IPO financial data and share price estimation, and Pre-IPO financial data can be useful to predict the volatility of stock based on earning variations. The research finding also showed that Pre-IPO financial data are helpful in effective decision making with regard to share pricing. [Shenoy and Kannan \(2018\)](#) highlighted that there is a link between IPO pricing and performance, and they are influenced by financial performance variables such as RONW, NAV, and EPS. This makes it easier for investors to comprehend the pricing of initial public offerings within a short period of time. The study also emphasized that investors should develop a proper method to participate in public offerings. [Tiron-Tudor and Achim \(2019\)](#) studied the relationship between financial reporting quality and share value. The research employed accountability as an overall metric for accounting efficiency. The share price is a major source of data for many stakeholders, particularly for those engaging in public enterprises. The results showed that accounting excellence has a positive effect on share price because when accounting improves it also improves the proportion of the company's information encoded in share prices. [Bünyamin ER \(2012\)](#) showed that DCF methodologies are used to explain a substantial portion of IPO stock prices. [Cogliati et al. \(2011\)](#) proposed a growth-based method for determining initial public offerings prices. It is likely that when an IPO is priced higher than the average,



the cash flow may increase more than the cash flow received. [Ande and Yoewono \(2018\)](#) proposed an approach to understand how various financial factors affect a share price. The study used market cap, percentage of placement in BI to third-party funding, debt equity ratio, and debt to ratio as variables to ascertain their impact on the stock price. It also used financial variables such as the ability of an asset to generate profit, the ease with which an asset may be converted into cash quickly, and a corporation's ability to repay long-term obligations. The study showed that these variables have a huge impact on stock price. [Bankole and Ukolobi \(2020\)](#) examined the link between Return on Net Worth and Share Price. The study revealed that there is a link between the two. The findings also showed that an increase in EPS does not always indicate a rise in stock price. The study further suggested that to examine the relationship between stock price and financial data, firms should completely reveal all the financial data connected to their operations and asset related information. [Glezakos et al. \(2012\)](#) investigated the impact of specific accounting data on stock prices. The study explored the relationship between financial information and stock prices, and it showed that certain accounting data affect stock prices. [Mohd-Rashid et al. \(2018\)](#) emphasized the importance of prospectus information and suggested that investors should not ignore it while evaluating the IPO offer price. The theoretical frameworks suggest that financial performance metrics are important to explain IPO prices. On the other hand, the fundamental models for valuation of IPOs were also a focus of another line of study. The review of the fundamental models for the valuation of IPOs showed that projection of cash flows, growth forecasts, DCF, and P/E multiples are influential in valuing and pricing IPOs. However, in terms of financial performance, prospectus information has not been thoroughly investigated. Further study on this area may be helpful in the formation of IPO prices. This study builds on the works of ([Tambun et al. 2018](#); [Shenoy and Kannan 2018](#); [Glezakos et al. 2012](#); [Mohd-Rashid et al. 2018](#); [Tiron-Tudor and Achim 2019](#); [Ande and Yoewono 2018](#), and [Bankole and Ukolobi 2020](#)). The study subscribes to the theorization that financial data and financial performance have a significant impact on share pricing.

### 3. Research Gap, Objective and Hypothesis

#### 3.1. Research Gap

The review of the literature revealed that most of the research studies on Indian IPO offer prices have predominantly examined the qualitative and non-financial aspects. The focus on performance indicators has thus far been limited. In Asian countries, especially in India, only a few studies have studied the financial performance indicators associated with IPO price estimation. However, these studies have not thoroughly engaged with the relationship between IPO offer price and the financial performance of the firm. Furthermore, this research has discussed the impact of only a few financial performance indicators. Therefore, there is a need to develop a model that can evaluate the IPO Offer Price using Financial Performance Indicators.

#### 3.2. Research Objective

The primary focus of the present study is to see whether Pre-IPO Financial Performance Indicators affect the Offering Price of IPOs issued in India. The study intends to achieve the following objective:

- *To investigate the relationship between IPO Offering Price and Financial Performance Indicators.*

#### 3.3. Hypothesis Formulation

In order to achieve the research objective, the following hypotheses have been formulated:

**H<sub>1</sub>:** *There exists a significant positive relationship between Net Asset Value and IPO Offer Price.*

**H<sub>2</sub>:** *There exists a significant positive relationship between Return on Assets and IPO Offer Price.*

**H<sub>3</sub>:** *There exists a significant positive relationship between EPS and IPO Offer Price.*

**H<sub>4</sub>:** *There is a positive relationship between Profit after tax and IPO Offer Price.*

**H<sub>5</sub>:** *There is a positive relationship between Industry P/E and IPO Offer Price.*

**H<sub>6</sub>:** *There is a positive relationship between Return on Net Worth and IPO Offer Price.*

#### 4. Sample and Data

##### 4.1. Sample Construction

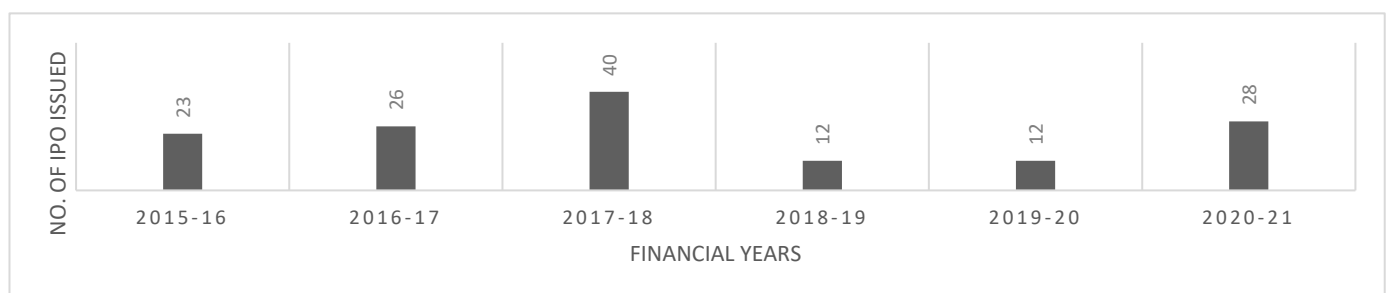
IPO companies listed on the NSE between FY 2015–16 to FY 2020–21 are considered as the research sample of the study. The sample for this study is chosen by using the non-probability subjective sampling method. This sampling method utilizes the researcher's judgment to select samples that contribute to the resolution of research problems or the accomplishment of research goals. The set of IPO issuing companies is obtained from the NSE's web-based database. The Table 1. provides an explanation of the sample selection process of the IPO firms.

**Table 1.** Procedure for Selection of Sample IPO Firms.

Mainboard IPOs issued in India from FY 2015–16 to FY 2020–21. (Mainboard IPOs are the IPOs listed in stock exchange with the condition that the face value of the post-IPO paid-up capital should be a minimum of Rs 10 crore)	141
Firms that have begun their IPOs but could not get listed on stock exchange.	04
Eliminated IPO issuing firms whose complete dataset for this study was not available.	15
<b>Total number of IPO firms included in the study as research sample</b>	<b>122</b>

Source: Computed by the authors.

The mainboard IPOs that were issued and listed on NSE India from FY 2015–16 to FY 2020–21 are shown in Figure 1. A total of 25, 11, and 10 IPOs are included in the final sample for the financial years 2016–17, 2018–19, and 2019–20, respectively. 4 IPOs that could not be listed are removed from the sample even though their IPO process has already begun.



**Figure 1.** Mainboard IPOs issued and listed on NSE India (FY 2015–16 to FY 2020–21). Source: Compiled by the authors.

##### 4.2. Data Collection and Variables

Secondary data have been used in this research work. Six consecutive financial years from 2015–2016 to 2020–2021 are chosen for the study. The data available in R.H.P for the most recent year, being the most immediate preceding IPO issue, have been considered as the basis for the collection of data. The details of the variables included in this study are provided in Table 2.

**Table 2.** Variables and their description.

Response Variable	Notation	Data Source
<b>Offer Price:</b> The price at which shares of a firm that will become public are offered to the general public. Log transformation for offer prices was used in present study.	OFP	NSE Database
<b>Explanatory Variables</b>		
<b>Net Asset Value</b> per share: A company's net asset value is derived by dividing its net worth by its common shares.	NAV	R.H.P.
<b>Return on Assets:</b> This describes the earnings of a firm as a percentage of assets.	ROA	R.H.P.
<b>Earnings Per Share</b> (W.Avg): The profitability metric represents how much net profit can be allocated to each outstanding share of common stock.	EPS	R.H.P.
<b>Profit after Tax:</b> An organization's net profit after tax is defined as Revenue altogether with other incomes less entirely cost with taxes.	PAT	R.H.P.
<b>Industry P/E Ratio:</b> It is a measure of the average price earnings ratio across all publicly traded companies in a particular industry peer set.	IPE	R.H.P.
<b>Return on Net Worth</b> (W.Avg): This metric refers to the amount of earnings earned by a corporation solely from the sheer strength of its shareholders' equity.	RONW	R.H.P.
<b>Control Variables</b>		
<b>Shares Offered:</b> The number of shares offered in an IPO to the general public. Log transformation for shares offered was used in present study.	OFS	R.H.P.
<b>Age of the Firm:</b> Log value of number of years since incorporation of the company until its public listing.	AGE	Authors' Calculations

Source: Compiled by the authors.

#### 4.3. Statistical Tools for Data Analysis

The descriptive statistics are used to describe the characteristics of the data. The data are further analyzed using a correlation matrix as well as by constructing multiple linear regression models as a primary statistical tool. The IBM SPSS 28.0.1.1 statistics software was used to accomplish all of the statistical measures for the analyses.

### 5. Model Formation

#### 5.1. Methodologies Employed in Previous Research Studies Focused on Financial Performance and IPO Pricing

Previous research studies have investigated whether performance indicators have an impact on IPO pricing using multiple regression and correlation (Navyatha and Reddy 2022; Ong et al. 2020; Willenborg et al. 2015; Hedau 2016). Furthermore, OLS regression (Beatty et al. 2000; Dhall and Singh 2017; Mohd-Rashid et al. 2018), and pooled OLS (Hendricks 2015; Shenoy and Kannan 2018) are used in the analysis.

#### 5.2. Formulation of Empirical Model

In the present work, the model formulation is primarily based on theoretical considerations. It is, therefore, rational to formulate the MLR model based on the theoretical underpinnings and analytic requirements of the study. Thus, the present study used multiple linear regression (MLR) to analyze the relationship between IPO offer price and financial performance indicators. The concept of multiple linear regression describes the association between a single response variable and several explanatory variables. It is crucial to note that a reliable regression model should not have any problems with standard assumptions. The study conducted various diagnostic tests (described in the Appendix A) in order to ensure that the standard assumptions in the formulated model are valid and acceptable. The overall significance of the regression model has been assessed using the F-statistic.



### 5.3. The Multiple Linear Regression Model

The current study used three regression models to evaluate the effect of financial performance indicators on IPO offer prices. Model 1 investigated the relationship between the IPO offer price and performance indicators using a single control variable 'AGE'. Model 2 examined the relationship between IPO offer price and financial performance indicators with another single control variable 'OFS'. To determine the overall effects of the study, Model 3 examined the relationship between IPO offer price and financial performance indicators by incorporating both 'AGE' and 'OFS' as control variables.

The regression equation serves as a generalized explanation of the regression model. The following research equations are developed to empirically test the association between the offer price of IPOs and financial performance indicators:

$$\text{MODEL 1: } OFP = +_1(NAV) + _2(ROA) + _3(EPS) + _4(PAT) + _5(IPE) + _6(RONW) + _7(AGE) + \varepsilon$$

$$\text{MODEL 2: } OFP = +_1(NAV) + _2(ROA) + _3(EPS) + _4(PAT) + _5(IPE) + _6(RONW) + _7(OFS) + \varepsilon$$

$$\text{MODEL 3: } OFP = +_1(NAV) + _2(ROA) + _3(EPS) + _4(PAT) + _5(IPE) + _6(RONW) + _7(OFS) + _8(AGE) + \varepsilon$$

The equations given above utilized standardized regression coefficients.

**OFP** or offer price is a **response variable**, whereas **NAV**, **ROA**, **EPS**, **PAT**, **IPE**, and **RONW** are predictor variables. They are incorporated in the study as proxies for financial performance indicators. This study also used **OFS** or shares offered in IPO, and **AGE** of the firm as the control variables.

## 6. Analysis and Interpretation of Results

### 6.1. Descriptive Statistics

Obtaining descriptive statistics for the data is the first step in any statistical investigation. Descriptive statistics are the summaries of a set of data that highlight the characteristics of the entire sample. The descriptive statistics of the response and explanatory variables are shown in the Table 3. The table given below illustrates that the study has an overall average OFP of 3.53. The difference in the lowest and highest values for the dependent variable OFP is also close, thus, implying that they are uniformly distributed. EPS also varies from Rs. −22.13 to Rs. 51.69 with an average of 11.04, and the standard deviation is 10.69. The average RONW is 20.26. The average NAV and ROA are 81.45 and 7.05, respectively. The industry P/E for the sample companies ranges from 1.60 to 636.71, indicating diverse exposure for various companies belonging to various industries. There are no uncommon trends among any of the independent or control variables.

**Table 3.** Descriptive Statistics.

	Observations	Minimum	Maximum	Mean	Std. Deviation
OFP	122	2.78	4.04	3.53	0.30
NAV	122	7.62	329.73	81.45	60.48
ROA	122	−4.15	34.39	7.05	6.99
EPS	122	−22.13	51.69	11.04	10.69
PAT	122	−127.46	3127.67	210.53	400.69
IPE	122	1.60	636.71	51.63	65.59
RONW	122	−23.78	225.01	20.26	24.62
OFS	122	6.72	9.40	8.19	0.44
AGE	122	1.00	2.93	2.21	0.31

Source: Compiled by the Authors.

### 6.2. Bivariate Correlation Matrix

Correlation coefficient are the unit-free value range between  $-1$  and  $1$  that quantifies how strongly two variables have a linear relationship with one another. See Table 4. to identify whether the offer price is dependent on specified variables related to financial performance indicators. In general, statistical significance is achieved when the “Sig. (2-tailed)” is less than  $0.01$ . It is important that a high degree of correlation (i.e., greater than  $0.8$ ) between explanatory variables is indication of a multicollinearity problem. (Gujarati and Porter 2009). The results demonstrate no multicollinearity in the models. The highest degree of correlation between IPO offer price and financial performance indicators is less than the threshold limit. In addition, multicollinearity between explanatory variables is also verified by using VIF scores. The findings validate that there is a strong positive correlation between the IPO offer price and NAV, ROA, EPS, PAT, and RONW. Hence, hypotheses  $H_1$ ,  $H_2$ ,  $H_3$ ,  $H_4$ , and  $H_6$  are accepted.

**Table 4.** Matrix of Bivariate Correlation.

	OFP	NAV	ROA	EPS	PAT	IPE	RONW	OFS	AGE
OFP	1								
NAV	0.502 **	1							
ROA	0.331 **	−0.052	1						
EPS	0.558 **	0.586 **	0.441 **	1					
PAT	0.275 **	0.200 *	0.084	0.454 **	1				
IPE	0.019	−0.043	−0.039	−0.109	−0.067	1			
RONW	0.283 **	−0.101	0.323 **	0.320 **	0.277 **	−0.086	1		
OFS	−0.423 **	−0.164	−0.323 **	−0.247 **	0.347 **	0.010	−0.144	1	
AGE	0.115	0.244 **	0.062	0.258 **	0.136	0.075	0.052	−0.159	1

Notes: \*\*, Correlation is significant at the 0.01 level (2-tailed). \*, Correlation is significant at the 0.05 level (2-tailed). Source: Compiled by the Authors.

Table 5 indicates that OFP (Offer Price) exhibits a significant correlation with six variables: NAV, ROA, EPS, PAT, RONW, and OFS. In addition, the variables IPE and AGE indicate a non-significant relationship with Offer Price. Each variable is listed in order of its value for the coefficient of correlation with the dependent variables, starting with the most positive and ending with the least positive. In other words, the variables are sorted in descending order, from the highest positive value to the lowest positive value, based on their correlation coefficients with OFP.

**Table 5.** Coefficients of Correlation.

OFP (the Response Variable)	
EPS	0.558 **
NAV	0.502 **
ROA	0.331 **
RONW	0.283 **
PAT	0.275 **
OFS	−0.423 **
AGE	0.115
IPE	0.019

Notes: \*\*, Correlation is significant at the 0.01 level (2-tailed). Source: Compiled by the Authors.

### 6.3. Analysis Using Multiple Linear Regression (MLR)

The construction of the MLR model has already been discussed in the present paper. The standard assumptions are also tested to estimate this model. Now for further data analysis, MLR is employed to examine the relation between the offer price of an IPO and financial performance indicators.

#### Outputs and Explanations:

In the current study, three regression models are tested. With regards to the objective of the study, we must concentrate on the statistical analysis we performed under Model 1, Model 2, and Model 3. The table below represents the coefficients of predictor variables and their relationship to the response variable or Offer Price of IPO. The results from Multiple Linear Regression Model 1 show that the OFP (Offer Price) is positively related to NAV, ROA, and RONW.

A summary of the results of Model 1 for the response variable OFP can be found in Table 6. The findings confirm that there is a positive relation between OFP and NAV, ROA, and RONW. The above regression results evidently show that OFP is significantly influenced by the performance measures NAV, ROA, and RONW. A total of 45.2% of the variance is explained by model 1. The coefficients of NAV (0.000), ROA (0.005), and RONW (0.008) are highly significant.

**Table 6.** Results of Model 1 for Offer Price Regression.

Explanatory Variables	Coefficients (Beta)	t-Statistics	Significance (p-Value)
(Constant)		21.638	0.000
NAV	0.494	4.887	<b>0.000</b>
ROA	0.252	2.872	<b>0.005</b>
EPS	0.083	0.666	0.506
PAT	0.073	0.907	0.366
IPE	0.087	1.244	0.216
RONW	0.216	2.698	<b>0.008</b>
AGE	−0.070	−0.965	0.337

Notes: Response Variable—OFP,  $R = 0.672$ ,  $R^2 = 0.452$ , F-Value = 13.437. Test at 5% level of significance. Source: Compiled by the Authors.

The results of Model 2 on the response variable OFP are shown in Table 7. A regression analysis reveals that there is a strong correlation between OFP and NAV, ROA, PAT, and RONW. Similar to Model 1, Model 2 also shows that there is a positive relationship between OFP and NAV (0.000), ROA (0.035), and RONW (0.041). Apart from these, there is also another variable PAT. It exerts a significant influence on OFP. There is a 53.9 % explanation for the variance in this model.

The regression results of Model 3 on the response variable OFP are shown in Table 8. The findings show that NAV (0.001), ROA (0.039), PAT (0.001), and RONW (0.041) are significant positive indicators with 55.2 % explained variation. Furthermore, the adjusted  $R^2$  indicates an increase from 0.452 in model 1 to 0.539 in model 2, and then from 0.539 in model 2 to 0.552 in Model 3. It can be concluded that model 3 has a higher explanatory power than the previous two models examined. The present study has proved that NAV, ROA, PAT, and RONW have a substantial impact on an IPO's offer price.

**Table 7.** Results of Model 2 for Offer Price Regression.

Explanatory Variables	Coefficients (Beta)	t-Statistics	Significance (p-Value)
(Constant)		11.629	0.000
NAV	0.431	4.645	<b>0.000</b>
ROA	0.175	2.133	<b>0.035</b>
EPS	−0.038	−0.330	0.742
PAT	0.287	3.307	<b>0.001</b>
IPE	0.076	1.186	0.238
RONW	0.154	2.070	<b>0.041</b>
OFS	−0.384	−4.767	0.000

Notes: Response Variable—OFP,  $R = 0.734$ ,  $R^2 = 0.539$ , F-Value = 19.074. N = 122, Test at 5% level of significance. Source: Compiled by the Authors.

**Table 8.** Results of Model 3 for Offer Price Regression.

Explanatory Variables	Coefficients (Beta)	t-Statistics	Significance (p-Value)
(Constant)		11.470	0.000
NAV	0.446	4.823	<b>0.000</b>
ROA	0.170	2.088	<b>0.039</b>
EPS	−0.024	−0.208	0.836
PAT	0.302	3.498	<b>0.001</b>
IPE	0.088	1.378	0.171
RONW	0.153	2.069	<b>0.041</b>
AGE	−0.118	−1.764	0.080
OFS	−0.404	−5.013	0.000

Notes: Response Variable—OFP,  $R = 0.743$ ,  $R^2 = 0.552$ , F-Value = 17.388. N = 122, Test at 5% level of significance. Source: Compiled by the Authors.

A brief description of the empirical findings from this investigation can be found in Table 9. above. Going by the statistical examination, we accept the alternative  $H_1$ ,  $H_2$ ,  $H_4$ , and  $H_6$  because their significance level is below the threshold limit (i.e., 0.05). The regression coefficients of the NAV, ROA, PAT, and RONW are 0.000, 0.039, 0.001, and 0.041, respectively, and they are at the significance level of 5%. The results, thus, show that these variables are related to our response variable which is the Offer Price.

**Table 9.** Summary of Empirical Results.

Hypothesis	Result
<b>H<sub>1</sub>:</b> <i>There exists a significant positive relationship between Net Asset Value and IPO Offer Price.</i>	<b>Accept</b>
<b>H<sub>2</sub>:</b> <i>There exists a significant positive relationship between Return on Assets and IPO Offer Price.</i>	<b>Accept</b>
<b>H<sub>3</sub>:</b> <i>There exists a significant positive relationship between EPS and IPO Offer Price.</i>	Reject
<b>H<sub>4</sub>:</b> <i>There is a positive relationship between Profit after tax and IPO Offer Price</i>	<b>Accept</b>
<b>H<sub>5</sub>:</b> <i>There is a positive relationship between Industry P/E and IPO Offer Price.</i>	Reject
<b>H<sub>6</sub>:</b> <i>There is a positive relationship between Return on Net Worth and IPO Offer Price.</i>	<b>Accept</b>

Source: Compiled by the Authors.

## 7. Findings and Conclusions

The major objective of this research was to examine the relationship between financial performance indicators and IPO pricing. In order to meet the objective, various financial performance indicators were analyzed for assessing their impact on the variability of the IPO Offer Price. The study utilized nine variables (one response variable, six explanatory variables, and two control variables). Out of these, the Offer Price of IPO was regarded as a response variable, and the variables namely NAV, ROA, EPS, PAT, IPE, and RONW were taken as proxies of financial performance indicators and also considered as predictor variables. Shares offered in IPO and Firm Age was included as control variables to limit their influence on Offer Price. The variables NAV, ROA, PAT, and RONW have significant explanatory powers to explain the offer price of an IPO. Conversely, EPS and Industry P/E showed no significant relationship with IPO offer price. It is important to note that 55.2% of the predictor variables are explained by the multiple linear regression model for the offer price. As a matter of fact, the study showed that variability of the IPO Offer Price is effectively determined by Pre-IPO Financial Performance metrics such as NAV, ROA, PAT, and RONW. The regression model indicated that NAV is the most significant factor influencing the formation of IPO Offer Price. The results of the study support the previous empirical research conducted by (Navyatha and Reddy 2022; Dhall and Singh 2017; Haque and Faruquee 2013; Al-Shubiri 2013). After the variable NAV, PAT is another important variable that influences the offer price of an IPO significantly. The findings of Hedau (2016); Modi and Pathak (2014) and Chen et al. (2017) support this result. With regard to ROA and IPO Offer Price, the result of the current research is consistent with the earlier research carried out by Hove et al. (2020) and Uwuigbe et al. (2012). Shenoy and Kannan (2018), Navyatha and Reddy (2022) conducted research on the relationship between the issue price of Indian IPOs and IPO pricing attributes. Our findings support the assertion of these research and confirm that RONW and NAV are key variables to explain IPO Offer Prices. We have also come to the same conclusion as Shenoy and Kannan (2018) and Bankole and Ukolobi (2020) which is that EPS is not associated with Offer Prices whereas RONW explains the Offer Price. Furthermore, the studies by Sharma et al. (2012); Mohanty (2012) provided similar findings that established a relationship between RONW and share price.

It is common for investors to become confused when many firms offer their securities at the same time. Choosing the right company to invest in may become challenging. It is advisable that investors should inspect a company's Pre-IPO financial metrics particularly NAV, ROA, PAT, and RONW. With regard to Offer Price, investors may compare the identified Pre-IPO financial indicators, i.e., NAV, ROA, PAT, and RONW with the market leaders of the IPO issuing companies. This will assist investors to make smarter investment decisions in IPOs and protect themselves from investing in unviable companies.

On the other hand, an IPO issuer may use NAV, ROA, PAT, and RONW as benchmarks for improving the company's financial performance prior to an IPO. For the issuers and the IPO investors, this will increase the worth of a firm by improving its valuation. As a result, IPO issuers will be able to attract investors and present their offerings at more competitive prices. IPOs with competitive pricing will boost the likelihood of IPO success. Furthermore, this study will narrow the gap between offering and listing prices to prevent speculative failure.

The findings of our study are clearly explained through two Indian IPOs listed in March 2021. Nazara Technologies Ltd. and MTAR Technologies Ltd. are two companies with similar business models and comparable issue sizes. When we examined the Pre-IPO financial performance of these two companies using NAV, ROA, PAT, and RONW, it appeared that MTAR Technologies performed significantly better than Nazara Technologies. Accordingly, MTAR Technologies' IPO valuation was higher than Nazara Technologies. Therefore, the higher IPO offer price was justified for MTAR technologies. On the other hand, Nazara Limited's negative listing day gain could have been averted if the offer price of the IPO had been established taking into account IPO performance indicators. Hence, the impact of Pre-IPO financial indicators can be directly assessed with IPO Offer Prices.



According to the results of the current study, it can be concluded that Pre-IPO performance indicators namely **Net Asset Value, Return on Assets, Profit after tax, and Return on Net Worth positively explain IPO Offer Price.**

## 8. Implications of the Study

Investing in an IPO requires an understanding of its true value. The suggested approach of this study can help in determining the inherent value of IPO stocks. It will enable potential investors to make informed decisions about investment. It is proved in this study that the Pre-IPO financial performance play a significant role in explaining IPO offering prices. By investigating the relationship between Financial Performance Indicators and IPO Offer Prices, this research makes an important contribution to the corpus of knowledge about Indian capital markets. Moreover, the study also suggested an approach for evaluating IPO stocks. We believe that both potential investors and IPO issuers will benefit from this study. These findings will assist IPO issuers in pricing their offerings, and lessen speculative failure by reducing the gap between offering and listing prices. Furthermore, this research will assist individual investors in making an informed decision about whether or not to invest in an IPO.

## 9. Limitations of the Study and Future Scope

The scope of this analysis is limited to mainstream Indian IPOs only, even though other SME IPOs could have been included as well. Moreover, a variety of different parameters could have been included while assessing the variability factor to analyze the link between the IPO offer price and performance measures. This study work could be extended to several Pre-IPO financial metrics, such as gearing/leverage, price-to-book value, and change in earnings levels, abnormal earnings, assets, and liabilities. The study could also include Tobin's Q ratio and ownership structure. IPO offer price can also be affected by other information combined with imperative elements such as the ability of top managers, the legacy of the business, and several other elements related to the macro environment. These variables can be studied together with the IPO Offer Price. The inclusion of SME IPOs in this research could have produced a more detailed analysis. This research has the potential to be explored further by including more variables. It can also be further extended in the context of global IPOs.

**Author Contributions:** The authors confirm the contribution to the paper as follows: A.Y. and J.M.P. conceived the presented idea. Material preparation, data collection and analysis were performed by [S.S., A.Y. and J.M.P.]. The first draft of the manuscript was written by [A.Y., J.M.P. and S.S.] and all authors commented on previous versions of the manuscript. All authors read, revised, reviewed and approved the final manuscript. All authors have read and agreed to publish final version of the manuscript.

**Funding:** The author received no financial support for the research, authorship and/or publication.

**Data Availability Statement:** Authors retain the rights to use the data and can be provided upon request to the corresponding author.

**Acknowledgments:** We are extremely grateful to anonymous reviewers for careful reading of our manuscript and their many insightful comments, constructive criticisms and suggestions, which have helped us to improve the quality of our manuscript. Usual disclaimers apply.

**Conflicts of Interest:** The authors declared no potential conflicts of interest with respect to research, authorship and/or publication of this article.

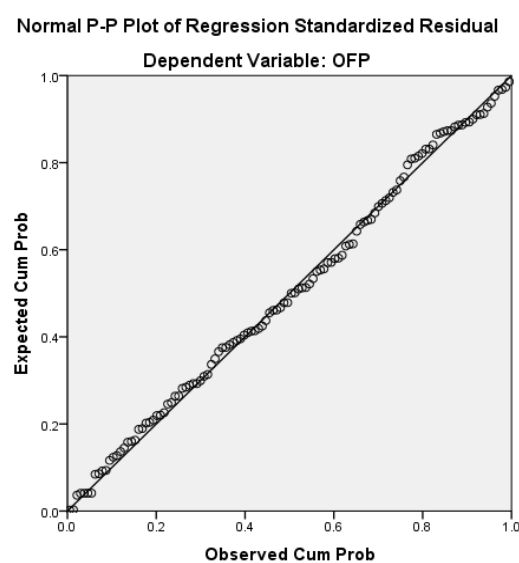
## Abbreviations

BSE	Bombay Stock Exchange
DCF	Discounted Cash Flow
DDM	Dividend Discount Model
FY	Financial Year
IPO	Initial Public Offer
MLR	Multiple Linear Regression
NSE	National stock Exchange
OLS	Ordinary Least Squares
P/V	Profit Volume
P/E	Price to Earnings
RHP	Red Herring Prospectus
SME	Small and Medium Enterprises
VIF	Variance Inflation Factor

## Appendix A

**Diagnostic Tests:** In order to check whether standard assumptions are being violated, the following diagnostic tests were conducted.

- **Test for Linearity:** The figure given below indicates the linear fit between response and predictor variables.



**Figure A1.** Standardized residuals with standardized predictions. *Source: Compiled by the Authors.*

- **Kolmogorov—Smirnov’s Normality Test** To determine whether a set of data is normal, we applied the Kolmogorov-Smirnov test.

**Table A1.** Test of Normality. *Source: Compiled by the Authors.*

Kolmogorov-Smirnov			
	Statistic	df	Sig.
OFP	0.064	122	0.200

- **Durbin-Watson's Test: The residuals autocorrelation test.** There is no autocorrelation evident in the DW statistic, which has a value of 1.970. As this value is very close to 2 denotes the absence of first-order autocorrelation.
- **VIF Scores to check Multicollinearity in data** The table given below reflects that our model is free from the issue of multicollinearity.

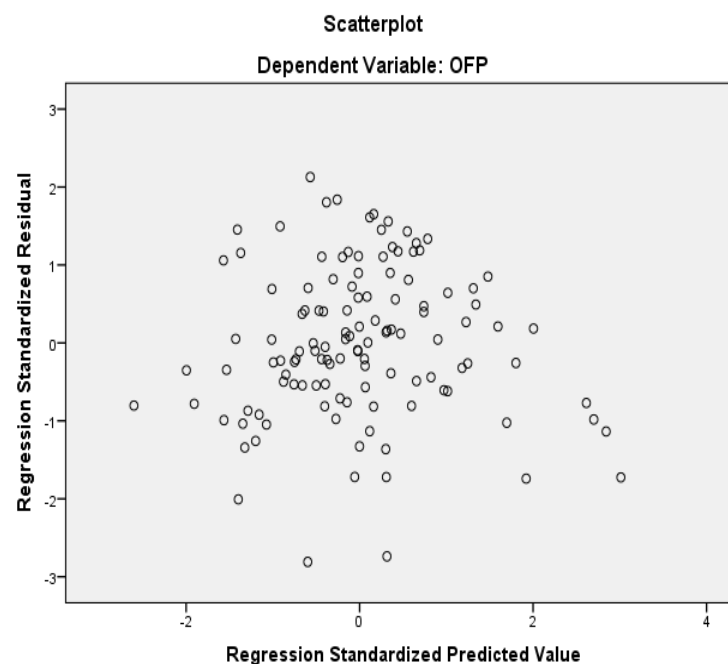
**Table A2.** Collinearity Statistics.

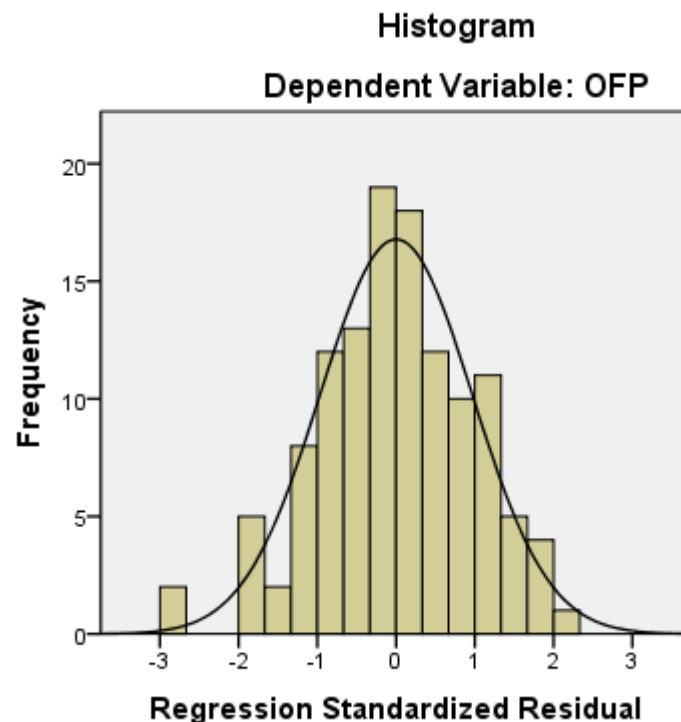
Variables	VIF	1/VIF
NAV	2.152	0.464
ROA	1.666	0.600
EPS	3.304	0.302
PAT	1.883	0.531
IPE	1.028	0.972
RONW	1.375	0.727
OFS	1.635	0.611
AGE	1.123	0.890

Source: Compiled by the Authors.

- **Heteroscedasticity test to check non-constant variance.**

When the residuals are not distributed normally, it causes Heteroscedasticity. The main cause of heteroscedasticity in the data is an outlier. Heteroscedasticity refers to the presence of a few observations in the sample that are large or small compared to the others. The below figure reflects that the variances of residuals are constant and the values of the residuals are distributed normally.

**Figure A2.** Scatterplot: variance of residuals. Source: Compiled by the Authors.



**Figure A3.** Histogram demonstrating the distribution of values of the residuals. **Notes:** Mean =  $1.40 \times 10^{-14}$ , Std. Dev. = 0.999, N = 122. *Source: Compiled by the Authors.*

**Cook's Distance approach** to estimate the effect of influential data points which produce model's bias. A regression analysis uses Cook's distance to detect significant outliers from a group of predictor variables. The obtained Cook's Distance values are all under 1 in our study disclose that individual cases are not unduly influencing the model. In other words, there are no influence cases biasing the model.

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