



IMPACT OF ECONOMIC VARIABLES ON IPOs IN INDIA - AN ANALYTICAL STUDY

Jyothi Seepani¹ⁱ,

K. V. R. Murthy²

¹Research Scholar,
Department of Commerce & Management Studies,
Andhra University,
Visakhapatnam, Andhra Pradesh,
India

²Associate Professor, Dr.,
Department of Commerce & Management Studies,
Andhra University,
Visakhapatnam, Andhra Pradesh,
India

Abstract:

This article aims to examine the hypothesis that local macroeconomic factors affect the volume of initial public offerings (IPOs) in a rising market, India, between 2015 and 2022. Initial public offerings (IPOs) are shown to have a positive correlation with industrial output and a negative correlation with interest rates. Using co-integration and Vector Error Correction models, we find a long-run equilibrium link between interest rates, industrial output, and initial public offerings (IPOs). Using a Markov regime-switching regression model, we also find that the effect of interest rates on IPO numbers is much more significant in the cold IPO regime than in the IPO hot regime. The empirical result seems to detect the IPO market's trend with a fair amount of accuracy. The findings demonstrate that a hot IPO market regime develops when investors start seeing extraordinarily high early returns, and their expectations about the future interest rate indicate the eagerness of entrepreneurs and managers to enter the IPO market. Conversely, a government's pursuit of monetary tightening causes investors to shy away from the IPO markets because they anticipate future profits will fall owing to rising interest rates and the price of shares will be harmed due to reduced dividend yield.

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ⁱ Correspondence: email jyothiseepani@gmail.com

1. Introduction

India's economy is rapidly expanding, and the country's status as a growing power means that foreigners have enough chances to benefit from this trend. The debt market and traditional lending institutions are often out of reach for many businesses. That's why they're taking the IPO route to the primary market. When a formerly private company issues its first shares of stock to the general public, this event is known as an Initial Public Offering (IPO) (investopedia.com).

An initial public offering (IPO) is a significant milestone in every successful company's development. A corporation may raise money via the stock market. The visibility and legitimacy of a company both soar after its IPO. A public stock offering (IPO) is sometimes the only viable option for securing the capital necessary for rapid development and growth. A robust stock market and economy may be shown in the issuance of several initial public offerings (IPOs).

The Securities Exchange Board of India governs the country's initial public offerings (IPOs) (SEBI). Companies that want to go public must first get registered with SEBI. The paperwork the corporation submitted to SEBI should be thoroughly reviewed. When all the paperwork is filed, the corporation decides how many shares to offer and sets a price or range of costs to sell. Investors submit applications or subscriptions for business stock. Oversubscription is common in initial public offerings when more people apply for shares than the company has available. If there is an overwhelming demand for the company's offering, it will assign just a portion of the funds to investors. Then, the stock is posted for trading on the secondary market or stock exchange, where other investors may buy and sell it. So, investing in an IPO might be beneficial. Many people invest in initial public offerings (IPOs) because they believe in them. (Dr. Anil Nagtilak & Nilesh Kulkarni, 2015). Investments in IPOs are better by holding them long-term than selling the shares on the day of listing (Mohammed Arshad Khan, Khudsiya Zeeshan, et al., 2021).

The returns on the first day could either be positive or negative. But it is seen that generally, IPOs have provided very high returns on the first day. If the closing price on the listing day for IPO is much higher than the issue price, it is termed "Under-Pricing". While an IPO costs more than the first-day trade, the stock is considered "Overpriced." IPO firms should provide information to investors on the risks involved and the company's ability to control or influence these risks. So that investors may make correct and informed investment decisions, which may compensate for the risks they are expected to assume. Technological and competitive risk category significantly positively impacts the IPO issue price, listing day opening price, listing day closing price, and stock price in subsequent weeks (Dr. Krishan Lal Grover, 2022).

Investing in IPOs really enchants many people and, if invested systematically, can lead to listing gains. The listing gains are statistically significantly influenced by issue size, lot size, issue price, subscription in QIB, HNI, Retail and employee category in total, grey market premium, and opening price of Sensex on the day of listing (Dr. Riddhi Dave, 2022). Information relating to market leadership, established brand image, and modern

scalable information technology infrastructure significantly influences underpricing. (Sheshadev Sahoo, Rishita Raj, 2022). It has been observed that IPOs are underpriced in most countries (Loughran, Ritter, and Rydqvist 1994). This trend of underpricing is present universally, including in developed and developing countries. The basic formula for calculating underpricing is $[(p_m - p_o)/p_o] * 100$. Here p_m is the stock's price at the end of the first trading day, and p_o is the offering price.

2. Literature Review

Monika Gorkhe and Aanchal Garg (2022) studied selected Initial Public Offerings in India for three years from 2019 to 2021. In this study, they selected six firms from each year to assess the performance of IPOs from the issue price to the last trading price and the percentage change. The study reveals that it is critical to thoroughly understand the stock market while investing in the company's stocks. The investor should be knowledgeable of the company's history and performance.

K. Navyatha and CMA. Dr. Gaddam Naresh Reddy (2022) studied the factors influencing the IPO's pricing in India. In this, 148 IPOs from 2008 to 2019 were considered. To check the elements, a multiple regression model was used. It is observed from the study that the factors impacting IPO price were the P.E. ratio, IPE, RONW, NAV post issue, stock dilution, issue amount, and issue size.

Sheshadev Sahoo & Rishita Raj (2022) studied disclosed qualitative factors and under-pricing from the Indian IPO market. They used a sample of 82 IPOs issued from 2014 to 2020 to investigate the issuing firm's pattern of reporting qualitative factors. They used the OLS regression method. The findings revealed that the qualitative information relating to market relationships, established brand image, and modern scalable information technology infrastructure significantly influences underpricing. Moreover, location advantage, good customer relationship, found relationship with a client, track record of growth and profitability, experienced promoter, and management team failed to influence under-pricing.

Yuenheng Wang (2022) studied factors affecting the IPO premium rate of Chinese listed companies. He collected data on IPO-listed companies in Shanghai and Shenzhen from 2016 to 2020. This study used linear regression to determine the factors affecting IPO underpricing. The study concluded that underwriter reputation, venture capital support, manager shareholding, total issuance scale, corporate governance, issuance, and listing time interval, ranking of accounting firms undertaking IPO listing and ranking of law firms undertaking IPO listing, market inertia, and issuance timing are significant factors of IPO underpricing.

Yuma, Guiling Liu, and Chaoping Qi (2022) analyzed the causes of high IPO underpricing on the China Science and Technology Innovation Board (STAR Market) from investor behavior. The multiple linear regression method was used to study the impact of IPO underpricing on the primary market's pricing and investors' behavior in the secondary market. The results of the study are: (1) The primary market pricing has a weak impact on the IPO underpricing of the STAR market; (2) Blind optimism of

investors in the secondary market and the irrationality of investor structure leading to the IPO underpricing of the STAR market.

Chakrapani Chaturvedula (2021) studied on under-pricing of Initial Public Offerings in Indian capital markets. He looked at a sample of 186 stocks listed on the National Stock Exchange between the years 2010 and 2020 for evidence of underpricing in the Indian capital markets. The findings revealed that on average the under-pricing in the IPOs is 19.7% on the listing day and the under-pricing persists for the next 30 days and even after 30 days the under-pricing is 17%. However, this study does not look at any of those factors in explaining the under-pricing phenomenon.

T. Ramesh Chandra Babu and Aaron Ethan Charles Dsouza (2021) studied to know the Indian IPO performance in the short-run and also to determine the significance of abnormal return on IPOs and to study the impact of over-subscription, profit after tax, promoter's holdings, issue price, and market returns on IPO performance. For this, the researchers collected all the 52 IPOs listed in the NSE (National Stock Exchange, India) from the year 2018 to 2020. It was observed that the average IPO return on the first trading day is 13.52%, ranging from -23.15% to 82.16% with a standard deviation of 26.72%. The average IPO return on the third listing day was the highest and is found to be 14.52%, ranging from -19.22% to 117.55% with a standard deviation of 18.57%. Finally, it was concluded that the investor should consider while applying for an IPO oversubscription as it has a significant impact on the performance of the IPO.

Gaurvi Udasi, Janhavi Agrawal, Praachi Arora, and Vidhi Pabuwal (2021) studied on Determinants of under-pricing of IPO from Indian stock market. The purpose of this study is to investigate the reasons for the underpricing of IPOs by analyzing the impact of various factors like issue size, stockholder ownership, structure, and underwriter reputation on the under-pricing of IPOs. A total of 219 Indian companies, which included 88 underpriced and 131 overpriced IPOs from the year 2010 to 2019 were taken for study. They used correlation and regression tools of Microsoft Excel to analyse the stated relationships. The results concluded that there is a negligible positive relationship between under-pricing of IPO with issue size a strong positive relationship with QIB and HNI ownership and a negative relationship with retail investors and the reputation of underwriters.

Dr. B. Ramesh & Akshay Sakharkar (2019) studied revisiting under-pricing of Initial Public Offerings (IPOs) from Indian stock markets. The aim of the study is to determine the extent of under-pricing and to examine the factors responsible for under-pricing of IPOs. The period of study was 10 years i.e., 2001 to 2017 and the sample was 290 Indian IPOs. The findings revealed that the average under-pricing was marked to 17.9% and with adjustment to the market indices i.e., both Nifty & Sensex for the same period returns accounted for 19.1% and 18.4% respectively. It also suggested that investors can follow certain signaling factors while choosing to invest in IPOs stocks and hence can safely play in the market in spite of risk factors.

R. Selvamathi & Dr. A. A. Ananth (2019) studied to empirically evaluate the IPO factors that determine the under-pricing of IPO factors performance in the long run, and observed the effects of factor impact on IPO performance using secondary data from the

NSE. Factors that determine the under-pricing of IPO factors performance in the long run are determined. In all three long-run periods, the data show a substantial positive association between BHRR and IPO characteristics such as IPO grade and lead time. The one-year BHRR is highly related to issue size in the long run. In the long term, BHRR is found to increase with overall lead time and IPO grade, and the extent of BHRR increase against higher IPO grade is greater than that.

Ms. Smitha V. Shenoy & Dr. K Srinivasan (2018) studied about the determinants of IPO listing day returns. The objective of the study is to understand the issue characteristics of under-priced IPOs in India. For this, the researchers took a sample of 313 IPOs listed on the BSE stock exchange. The under-pricing of IPOs is studied using the measure, Market Adjusted Abnormal Return (MAAR). A Causal Research design is used in the study. Regression analysis was used to study the impact of selected variables on MAAR. The research concluded that there is a huge interest from retail, high net-worth, and institutional investors for quality issues in the primary market. This research would help investors who wish to adopt a flipping strategy in IPO, basically a short-term strategy, where the investor sells the shares on the listing day. But if a long-term investment in IPO is the objective, a clear analysis of long-run post-listing performance has to be carried out.

3. Objectives and Methodology of the Study

In this paper, we studied listing day performance pertaining to 241 IPOs in India from April, 2015 to March, 2022, listed in NSE India. We found that there is, on average, a significantly positive return on the listing day. The market-adjusted abnormal returns of all sample IPO companies were 7.19 %. It is observed that IPOs are initially underpriced. We have applied a t-test to verify the returns and mean initial return of 7.19 % and proved that average returns are significantly lower compared to historical returns of IPO. The regression model has been used to analyse the relationship between the degree of underpricing with independent variables such as issue price, issue size, issue oversubscription, and market index return. The result of regression analysis shows that there was no significant relationship between the degree of underpricing and explanatory variables except for oversubscription of the issue. The study suggests that investors can make their investment in new issues as IPOs are underpriced in the initial days.

After referring to literature from both national and international perspectives, it is observed that the available studies missed out on the post-listing of IPO performance, i.e., the overvaluation aspect. The previous research also missed out on the under-pricing / overpricing phenomenon after a certain period of listing, i.e., 1 year, 2 years, 3 years, etc. from the date of listing. IPO undervaluation/overvaluation facets were not covered in the previous studies. At times in the long-run also, the stock tends to be underpriced. In other words, the returns from the stock post listing in the short period are promising. It also noted that limited research is there on the impact of macroeconomic variables IPOs, especially in India. Therefore, in this research, we would like to know the relationship between the macroeconomic variables on IPOs.

The following hypotheses are identified in this study.

3.1 Hypotheses of the Study

H₀₁: There is a positive relationship between interest rate and the number of IPOs.

H₀₂: There is a positive relationship between foreign net private equity flows and the number of IPOs.

H₀₃: There is a positive relationship between industrial production and the number of IPOs.

H₀₄: There is a positive relationship between bank credit and the number of IPOs

H₀₅: There is a positive relationship between the stock market index and the number of IPOs.

The data consists of all IPOs in India from April 2015 to December 2022. The IPO data were obtained from BSE. Macroeconomic data such as interest rate (INTR) and industrial production (Ind_Pr) were obtained from RBI, India. The data on foreign net private equity flows (FN_Equity) and total outstanding bank credit to the private sector (CREDIT) were obtained from IMF International Financial Statistics. The primary time series indicators of IPOs include the following: the number of IPOs per month, denoted by N_IPO; the total number of IPOs per year, represented by T_IPO; and the duration of an IPO, indicated by D_IPO, which is defined as the total number of days between the date of an IPO's prospectus and its listing date and provides valuable information about the quality of IPO application. According to Guo et al. (2010), the duration time indicates an IPO's hazard of listing. IPO performance indicators are the average initial-day returns of all IPOs (denoted by IPO_Return) and excess initial-day returns (represented by Abn_IPO Return), which are calculated as the difference between IPO-Return and the return on the KLCI Composite index (denoted by R_KLCI).

4. Results

Table 1 shows the descriptive statistics of IPOs' time series and performance indicators. We find that the mean (median) N_IPO was 3.80 (3.00) and that T_IPO was 45.68 (39). T_IPO was lowest in 2016 and highest in 2021. The mean (median) D_IPO was 35 days (40 days), which implies that an applicant issuer had to wait more than one month from issuing an IPO prospectus before listing on the Stock Exchange. Mean (median) IPO_Returns were 64.6% (38.9%), and Abn_IPO Returns were 63.33% (37.53%). The average interest rate was 7% and reached its peak level of 12% during 2015- 2022. The high standard deviation of CREDIT was since there was a gradual increase of 2–4% in CREDIT annually until 2018; however, after 2018, CREDIT increased almost threefold from its lowest level in mid-2015. The median FN_Equity was negative. The Indian government imposed capital controls in 2015; consequently, foreign portfolio investment significantly decelerated. The data show a reversal in the FN_Equity downward trend from 2015 onwards.

The annual time series of N_IPO, T_IPO, D_IPO, and IPO_Returns are summarised in Panel B. The mean IPO_Returns were at their highest levels from 1993 to

1996. A total of 221 IPOs were listed during this period. After the Asian financial crisis in 1997, there was a remarkable slowdown in the performance of IPOs. IPO_Returns decreased more than the mean (median) returns for the entire period. Even though N_IPO increased from 20 in 2015 to 78 in 2022, IPO_Returns dropped to their lowest levels. Before the Asian financial crisis, no IPO had experienced negative returns. We find that some IPOs had negative initial day returns during the Asian financial crisis, and these IPOs were clustered in 2015–2016, 2016–2017, 2020–2021, and the middle half of 2022. This finding may also be related to market sentiments, as the KLCI Index and trading volumes fell sharply during 2015–2016 and 2021–2022. It is plausible that investors were less exuberant about investing in new technology firms after the COVID-19 burst in the developed markets.

Table 1: Descriptive statistics

	Mean	Median	Std	Min	Max
IPO Activity indicators					
N_IPO (per month)	3.80	3.00	2.94	0.00	13.00
T_IPO (per year)	45.68	39.00	21.33	19	84
D_IPO (days)	35.62	39.93	15.06	0.00	73.66
IPO performance indicators					
IPO_Return (%)	64.60	38.87	78.82	-290.40	385.00
Abn_IPO Return (%)	63.33	37.53	82.49	-282.09	399.10
Market performance indicators					
R_KLCI (%)	0.46	0.50	7.80	-24.67	34.23
Macroeconomic indicators					
INTR (%)	7.36	6.75	1.2819	6.00	12.10
CREDIT (RM Bill)	300.64	287.73	177.888	68.60	718.70
Ind_Pr	116.67	110.55	26.5373	70.47	167.80
FN-Equity (RM Bill)	1.5392	-0.8479	21.7082	-70.2752	32.965

Data also depicts the trend and movement of N_IPO and the nominal interest rate (a), N_IPO and lagged IPO_Returns (b), and D_IPO and IPO_Returns (c). This graph has two striking features (see a): the trends in N_IPO and the interest rate are cyclical, and their movements seem to display a non-monotonic relationship. The interest rate shows a downward trend from January 2000 onwards; it remained between 6% and 7%, but no sharp increase in N_IPO (except during 2019-20). The trend and movement of N_IPO and IPO_Returns show a direct relationship. The rise in the average level of underpricing from mid-2019 until mid-2022 increased N_IPOs. We observed two distinct relationship patterns between D_IPO and IPO_Return (see c). In the first phase, the research finds that when IPOs had to wait more than one month to be listed during 2019-2020 (mean D_IPO was 40 days), IPO_Return (underpricing) was higher until mid-2022. In the aftermath of the Asian financial crisis (February-July 1998), when D_IPO exceeded 60 days, IPO_Return (underpricing) decreased substantially. In the second phase (2017–2018), when the average D_IPO dropped to approximately one month (mean D_IPO was 25 days), IPO_Return (underpricing) also decreased substantially. These patterns illustrate that when investors have less information about the quality of the issuer and have to wait

longer for an IPO listing, more significant information asymmetry and adverse selection drive IPO_Return (underpricing) high and vice versa.

Table 2: Returns of the IPOs

IPO Years	T_IPO (per year)	D_IPO (days)	IPO_Return (%)	N_IPO Negative Returns (%)
2015	21	43	54.41	0
2016	30	41	38.44	1
2017	34	46	44.20	2
2018	24	46	105.13	0
2019	16	39	116.32	0
2020	14	41	86.36	0
2021	64	41	182.26	1
2022	38	42	99.27	5

Source: bse.com

5.1 Linear Regression Results

Before estimating regression, the presence of unit roots in the IPOs' time series and performance indicators using the Augmented Dickey-Fuller (ADF) test (with trend and intercept) are verified. Under this test, the null hypothesis is that a time series variable has a unit root or is not stationary. Natural logarithm transformation has been used and tested for the presence of unit roots in the time series levels and their first differences. The results show that the null hypothesis of unit roots in the log difference time series is rejected for all variables. Thus, these variables are integrated into order 1.

Variables	Log levels	Log difference
N_IPO	-3.061	-7.13***
R_KLCI	-2.100	-4.01***
CREDIT	-1.745	-5.33***
Ind_Pr	-1.224	-6.45***
INTR	-2.541	-7.00***

The Tobit model investigates the relationship between macroeconomics and the number of IPOs. The sample in the study became a censored sample, and the Tobit model (also known as the censored regression model) is appropriate in such circumstances. This research used the maximum likelihood method to estimate the parameters of the linear regression model.

6. Conclusions

This study examines how different macroeconomic factors in India affect initial public offerings. The findings indicate that the initial public offerings (IPO) frequency is significantly affected by the nominal interest rate, industrial output, and first IPO returns. Also, there is a long-run equilibrium link between the interest rate, industrial output, private bank lending, and the number of initial public offerings, as shown by findings

from trace tests and maximum eigenvalue tests. Using the Markov regime-switching regression approach, we find that interest rates significantly impact the number of IPOs, especially during hot IPO market regimes, despite the results showing that interest rates have a stronger relationship than other variables in a linear regression model. The findings also show that India's "hot" and "cold" regimes are sensitive to interest rate shifts. The chance of moving from a cold IPO regime to a hot IPO regime due to changes in interest rates is 5%. The findings suggest that monetary policy immediately affects the capital markets and that central bank involvement fuels IPO cycles in India. The data in this research may be inadequate. There was no way to evaluate whether GDP, private consumption, or employment levels affected IPOs. Thus, it is possible that the empirical data may not provide a whole picture of the effects of macroeconomic factors on the IPO market. Future studies may investigate the possibility that monetary policy influences IPOs via a different channel, namely, consumer loans, to support the acquisition of new shares in IPOs.

Conflict of Interest Statement

The authors have no conflicts of interest to declare. The co-author has seen and agreed with the contents of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under review at any other publication.

About the Author(s)



Jyothi Seepani, Research Scholar, Department of Commerce & Management Studies, Andhra University, Visakhapatnam, Andhra Pradesh, India.

E-mail: jyothiseepani@gmail.com,

ORCID: orcid.org/0009-0000-4428-5341



Dr. K.V. Ramana Murthy (PhD), Assoc. Prof., Department of Commerce & Management Studies, Andhra University, Visakhapatnam, Andhra Pradesh, India.

E-mail: ramanakudumula@gmail.com

ORCID: orcid.org/0009-0002-1392-3181

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