Theoretical and Practical Research in Economic Fields

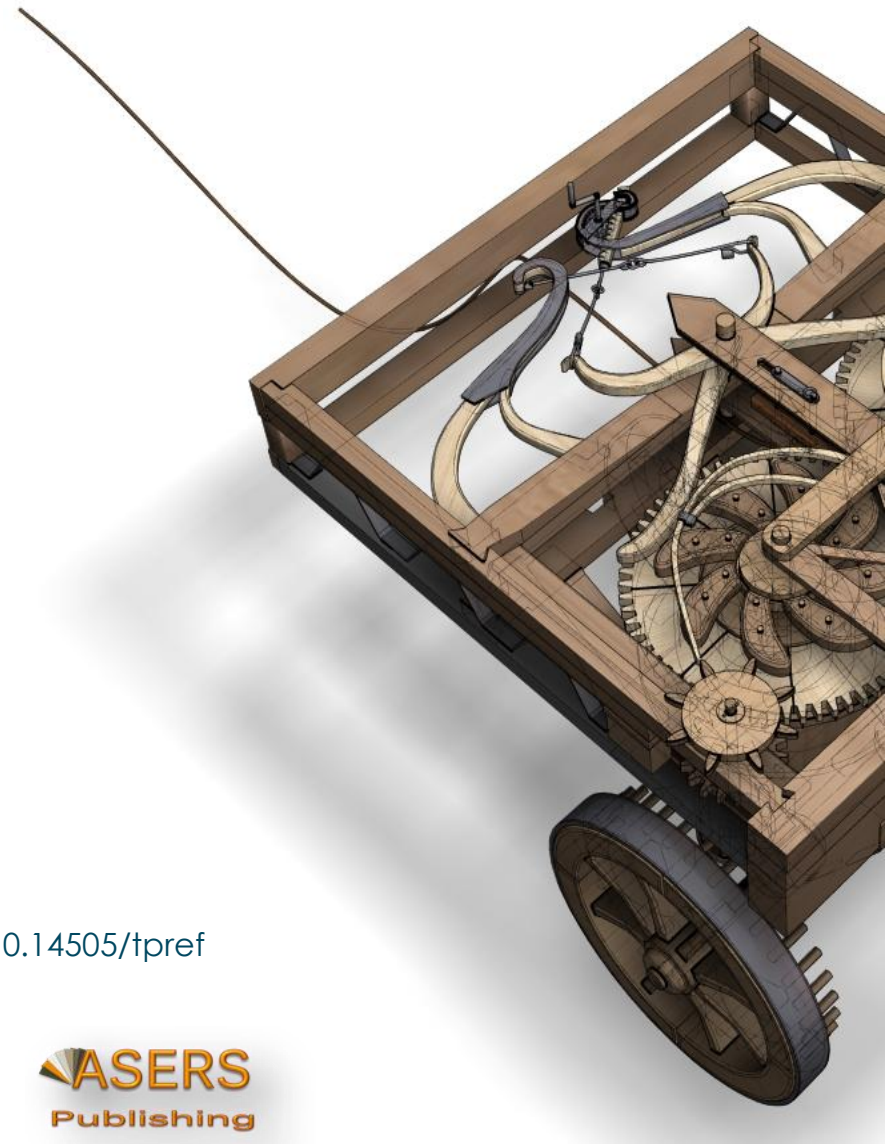

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Table of Contents

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Theoretical and Practical Research in Economic Fields

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Digital Adoption and Price Discovery in Shadows: Evidence from Indian IPO Grey Markets between 2016-2025

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Abstract: This study examines the role of digital adoption and price discovery through informal IPO markets in India. Due to price anomalies, sentiments around the IPO listing day are channelised through Informal markets known as grey markets. This study verifies the determinants of grey market IPO prices and their linkages with the formal market IPO under-pricing. Apart from dominant market and firm-specific factors, it examines how digital adoption variables such as digital payment usage and new demat accounts affect the IPO prices in both channels. In the post-pandemic period, there is a surge in the number of IPOs offered and participation of institutions and individuals in IPOs. Grey market allows traders to bid on IPO applications before they are officially listed, helping to assess under-pricing in issue prices, if any. This study uses data of 1,155 IPOs that went public in India between 2016 and 2025. Using OLS models, the study examines the relationships among variables, and findings indicate that both grey market activity and digital adoption directly influence listing day prices, confirming that under-pricing is predictable through informal channels. Investors should consider these factors, in addition to fundamental aspects, when making IPO investment decisions.

Keywords: grey market premium; IPO market; listing day premium; firm-specific factors; under-pricing.

JEL Classification: G10; G11; C31; C30.

Introduction

The grey market refers to an unofficial or informal market where Initial Public Offer (IPO) share applications with the likelihood of allotment are traded. The trade in the grey market happens largely in cash and in person, directly without any presence of intermediary. This type of market is quite prevalent in emerging countries. Investors gauge market sentiment regarding the shares offered and assess their potential demand. Shares are traded in lots at prices commonly known as “Kostak” or “Sauda.” These prices are typically quoted at a premium or discount compared to the issue price. It is generally considered a proxy for the listing day price. Participants in the IPO market track grey market prices to speculate on the listing day gains and accordingly decide whether to apply for an IPO or not. It involves a huge risk as it is an unregulated market. However, it acts as an indicator for decision-making too among investors. There is less known fact about the extent to which grey market prices influence the listing day price, eventually affecting investors’ gains or losses. It is essential to assess the influence of grey market premiums when controlled by the issue price on the listing day gains.

In this digital era, IPO markets are vibrant places where companies seek to raise capital, attracting not only institutional investors but also a wide array of traders and short-term investors who eagerly anticipate capitalizing on the immediate listing date returns. Further, the thrill of the listing day, which is often characterized by some significant price movements, remains a primary attraction, particularly during bullish market sentiment when investor enthusiasm is relatively high. There are a number of factors that influence the extent of gains realized on listing day including the ease of investments and dematerialization of financial securities. The ease of investments has grown manyfold due to internet access and digital adoption in the financial markets. Besides, the dematerialization of shares that allows mobile and online trading increased the number of participants considerably overtime. The informed investors seek early profit opportunities, especially in IPO markets, where price efficiency and information asymmetry are considerably high (Fu *et al.* 2025). In recent times, especially in emerging economies, grey market trading has become a platform for price discovery (Krishnamurti *et al.* 2012). In particular, India is witnessing a substantial increase in digital adoption in financial markets, reflected by the rise in digital payments and new demat accounts over the past decade. (Kumar *et al.* 2025). This digital shift has made IPO subscriptions more accessible, leading to higher trading volumes and fresh market sentiments.

Furthermore, the listing and pre-listing day price volatility in the regulated and grey markets are witnessing tremendous growth in recent times. Also, the factors affecting the listing day gains are not clearly explained. More often, the firm specific characteristics play a crucial role in determining the IPO prices. These include predominantly the financial indicators, such as RoA, ROCE, PE and promoter shareholding ratios (Zhang & Neupane, 2023). In addition, the effect of earnings performance before listing has an influence on the IPO pricing (Suresha B *et al.* 2023). The general market conditions, overall market sentiments, investor risk appetite, and the level of market volatility also play a significant role in determining the level of IPO under-pricing (Aggarwal *et al.* 2009). During a favourable market momentum amidst the IPO period, investors are more likely to participate in the IPO, reducing the level of under-pricing. While unfavourable market conditions like bearing may increase the level of under-pricing as investors become more risk-averse and demand a higher return to take on additional risk. The market conditions also impact the level of participation from QIBs, RIIs, and NIIs, affecting the demand for the IPO and listing day performance. Findings have also shown that access to vital information for investors influences an IPO's performance, particularly when QIBs are assumed to have access to insider information (Bansal & Khanna, 2012). The grey markets in India are emerging as a strong predictor of the IPO pricing. It plays a significant role in determining the listing day IPO price. The grey market premium (GMP) is the difference between the IPO allotment price and the closing price of the stock in the grey market before listing. It signals market expectations and demand for stock. A higher GMP typically indicates strong investor sentiment and a high likelihood of listing day gain.

As there is an active and growing grey market presence in the country, price discovery is shifting from formal to informal channels. Grey market dynamics may influence the price trends in the formal markets. Though factors that influence GMP and listing day gain have been researched extensively in developed countries there are no specific studies in emerging economies such as India specifically verifying the price spillover between these markets. In the last two decades, India has experienced tremendous growth in digital adoption in financial markets, and its influence on GMP and listing day is less known. This knowledge is essential for informed decision-making. This study aims to verify factors determining GMP and IPO Listing Day gains, particularly focusing on unexplored factors such as digital adoption, macroeconomic factors, and other company and market-specific factors. The outcomes of this study help both investors and policymakers in decision-making.

1. Literature Review

IPO market performance and factors determining IPO under-pricing are a matter of research interest both for finance practitioners and academicians. Multiple theories attempted to explain the underlying causes of this phenomenon and identify the key factors that influence IPO listing day prices. Some of the most commonly cited determinants of IPO under-pricing include the level of asymmetric information between issuers and investors, the degree of risk associated with the issuing firm, and the level of demand for the IPO (Perera & Kulendran, 2015). According to the signalling theory, the level of under-pricing is positively related to the level of asymmetric information, as issuers with private information about their firms' true value may use under-pricing as a signal to convey this information to investors, thereby reducing the adverse selection problem and increasing the likelihood of a successful IPO (Yarram, 2014). Overoptimism about the post-listing performance causes the IPO price (Paleari & Vismara, 2007). Sentiments of retail investors at the subscription phase and willingness to overpay signal higher demand and listing day under-pricing (Dorn, 2009). IPO underwriter reputations and the number of patents held by the issuing firm signal post-listing firm performance (Deb, 2013). The degree of Information disclosure in red herring prospectuses affects the IPO performance (Sherif *et al.* 2016).

Furthermore, the prospect theory suggests that under-pricing is a function of the level of risk associated with the issuing firm, which is often measured by its volatility, leverage, or industry classification. Predominantly, some factors are external and internal to the issuing company. For instance, market factors are uncontrollable factors for a firm but have a significant impact on its valuations (Ghosh *et al.* 2012). Empirical findings identify several firm-specific characteristics that correlate with IPO under-pricing, such as the firm's age, turnover, pre-IPO leverage, and the share held by promoters. The literature consistently points out that younger firms tend to experience higher levels of under-pricing due to greater uncertainty about their future performance. Moreover, the composition of ownership, particularly the proportion of shares held by promoters, has been shown to mitigate the adverse effects of information asymmetry (Ljungqvist & Wilhelm, 2005). A higher promoter share can signal confidence to investors, thereby potentially reducing under-pricing (Rani, 2014). Similarly, the predictability of listing day price and price inefficiencies in the market confirmed the existence of forecasting errors and earnings management (Abdulai & Sharifzadeh, 2015). Further evidence proves the relationship between firm size and IPO oversubscription and states that firm size has a significant and negative influence on oversubscription. Large firms with a proven track record face information asymmetry and do not need to underprice their IPOs to attract investors or prevent oversubscription (Tajuddin *et al.* 2017). The influence of grey market premium and finds that GMP has a positive influence on the listing day price (Chandu *et al.* 2024). Few studies confirm sentiments around the grey market transform to the formal market IPO pricing. Short selling in the grey market signals probable under-pricing on the listing day (Krishnamurti *et al.* 2012). The existence of the grey market before the official listing day injects an element of pre-market price discovery, allowing potential investors to express their interest and willingness to pay for the shares before they are available on the primary exchange (Lowry *et al.* 2010). The pre-IPO financial performance is strongly correlated with listing day performance, particularly the Return on Net Worth (RoNW) and Price-Earnings (P/E) ratio, which are critical for investor decision-making (Shenoy & Srinivasan, 2018). Research on the relationship between issue size and average bid price in the pre-issue market shows that issue size affects performance on the first day of listing. During the pre-issue phase, prices are primarily determined by a small group of investors, while larger market participants influence post-listing prices (Gao *et al.* 2020). Institutional investors through block trades are at advantage over others in IPO markets in determining prices (Pukthuanthong-Le & Varaiya, 2007). Similarly, issue size and listing day market condition has a strong influence on IPO performance (Deng & Zhou, 2015). The rate of subscription by retail to institutional investors signals the probable listing day open price (Banerjee & Rangamani, 2015). Macro-economic variables such as local government bond yields has influence IPO prices but capital market indicators not necessarily influence IPO values. (Meluzín *et al.* 2015). Investors often find it challenging to determine the importance of different pieces of information needed for decision-making. Among all types of information, accounting data is particularly crucial for investment decisions, as it directly influences share prices in both IPOs and secondary markets (Jeroh & Edesiri, 2015). Among the crucial accounting information, solvency and profitability ratios are widely used for stock valuation. Particularly, the Debt-to-Equity ratio, Liquidity ratio, and Return on Assets (ROA) and Return on Equity (ROE) are the most important for decision-making (Setiawanta *et al.* 2020).

The literature indicates that information asymmetry and market or firm-specific factors significantly influence IPO pricing. However, there's limited evidence of the strength of grey market variables to forecast price and volume. More research is needed to explore the relationship between formal and informal markets, especially

in emerging economies. Further, in the emerging economies, market dynamics are quite different. Empirically, it is unknown how far the grey market and growth in digital adoption affects IPO prices. Further, it is essential to know the role of Net Portfolio Investments (NPI) and Net Foreign Direct Investment (NFDI) on IPO prices in India. In this study, an attempt has been made to verify the relationship among these variables. This knowledge is useful for traders and investors to make informed decisions.

2. Data and Methodology

2.1. Research Variables

This study attempts to verify the relationship between the grey market and the formal market IPO listing day gains. It explains factors determining IPO grey market returns and their influence on listing day prices. In addition to market and firm-specific variables, the study also evaluates the significance of digital adoption in the economy on both the grey market and formal market performance on IPO listing days. The analysis employs a cross-sectional linear regression model to examine the relationship between the grey market prices, IPO listing day performance, and firm-specific and market-related variables. A paired sample Student test and the Wilcoxon test were employed to investigate the mean differences between the variables. Listing day price (LDP) and Listing Day Gain (LDG) percentage at close in NSE at t_0 and Grey Market Premium (GMP) at t_{-1} are considered as the dependent variables of the study. Fundamental financial predictors and market-specific factors are considered in the study. Further digital adoption was measured by proxying digital payments and new demat accounts. Also, the study verifies final market macro factors such as net portfolio investments and net foreign direct investments. Table 1 shows the variables examined in this study.

Table 1. Explanation of research variables

Variables	Acronym	Variable explanation
Market Factors		
Volatility Index	vix	Monthly Volatility Index value
Nifty monthly Returns	nmr	Monthly closing returns of the NSE index
Listing day Price	ldp	Listing day open price at NSE
Listing Day Gain	Ldg	% difference between listing day closing and issue price
Issue-Specific Factors		
Total Application	ta	Total bids received or total overall subscription rate
Issue Price	ip	Public offer price band
NII	nii	NII Subscription Rate
RII Subscription Rate	rii	RII Subscription Rate
Grey Market Factors		
%Grey Market Premium	%gmp	% difference between the issue price and the grey market price
Firm-Specific Factors		
Return on Capital Employed	roce	immediate previous year's annual return on capital employed
Debt/Equity	de	Pre-issue debt/equity ratio
P/E Ratio	per	Pre-issue Price to Earnings Ratio
Promoter Holding Pre-Issue	promopre	Pre-issue period promoter shareholding
Promoter Holding Post Issue	promopost	Pre-issue period promoter shareholding
Digital Adoption and Macro Factors		
Digital payments	digipay	Net Monthly digital payments made in all modes
New Demats	newdemat	Month-wise Number of new demat accounts opened
Net Foreign Direct Investments	nfdi	Net Foreign Direct Investments
Net Portfolio Investments	npi	Net Portfolio Investments

2.2. Sample Size

The study covers all the main board IPOs that were issued between 2016 to 2025. The study examines a total of 1,155 initial public offerings (IPOs) in the Indian IPO market since 2016, covering over 17 prominent sectors.

These IPOs were listed on the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). Financial data for the companies involved was sourced from the red herring prospectus documents submitted to the Securities and Exchange Board of India (SEBI).

Additionally, grey market prices were gathered from the platforms of IPO Watch (https://ipowatch.in/ipo-grey-market-premium-latest-ipo-gmp/) and Investor Gain (https://www.investorgain.com/gmp/ather-energy-ipo/1237/) brokers.

2.3. Research Models

The study verifies the relationship between the dependent and independent variables by analysing the aggregate sample of IPOs using the following regression models:

Grey market premium is computed with the help of the following equation. Ip is the issue or offer price and CP t_{-1} is the closing price in the grey market before the listing day of the IPO.

$$GMP\% = \left(\frac{CP\ t_{-1}}{ip} - 1\right) \times 100 \quad (1)$$

Listing day gain percentage is computed with the help of the following equation. Ip is the issue or offer price and listing day CP t_{-1} is the closing price in the formal market on the listing day of the IPO.

$$LDG\% = \left(\frac{Listing\ day\ CP\ t_{-1}}{ip} - 1\right) \times 100 \quad (2)$$

2.4. Ordinary Least Squares (OLS) Models

$$ldp = a + \beta_1\,(gmp\%) + \beta_2\,(nmr) + \beta_3\,(vix) + \beta_4\,(nii) + \beta_5\,(rii) + \beta_6\,(ta) + \beta_7\,(ip) + \beta_8\,(roce) + \beta_9\,(de) + \beta_{10}\,(per) + \beta_{11}\,(promopre) + \beta_{12}\,(promopost) + \mu_i \quad (3)$$

$$ldp\% = a + \beta_1\,(gmp\%) + \beta_2\,(nmr) + \beta_3\,(vix) + \beta_4\,(nii) + \beta_5\,(rii) + \beta_6\,(ta) + \beta_7\,(ip) + \beta_8\,(roce) + \beta_9\,(de) + \beta_{10}\,(per) + \beta_{11}\,(promopre) + \beta_{12}\,(promopost) + \mu_i \quad (4)$$

$$gmp\% = a + \beta_1\,(ldp) + \beta_2\,(nmr) + \beta_3\,(vix) + \beta_4\,(nii) + \beta_5\,(rii) + \beta_6\,(ta) + \beta_7\,(ip) + \beta_8\,(roce) + \beta_9\,(de) + \beta_{10}\,(per) + \beta_{11}\,(promopre) + \beta_{12}\,(promopost) + \mu_i \quad (5)$$

$$gmp\% = a + \beta_1\,(vix) + \beta_2\,(nmr) + \beta_3\,(ldp) + \mu_i \quad (6)$$

$$gmp\% = a + \beta_1\,(ta) + \beta_2\,(ip) + \beta_3\,(nii) + \beta_4\,(rii) + \mu_i \quad (7)$$

$$gmp\% = a + \beta_1\,(promopre) + \beta_2\,(promopost) + \beta_3\,(roce) + \beta_4\,(der) + \beta_5\,(per) + \mu_i \quad (8)$$

Where, vix is the volatility index, nmr is nifty monthly returns, ldp is the listing day price, ldg is listing day gain, ta is total application, ip is issue price, nii is net institutional investors, rii is retail individual investors, gmp% is grey market premium, roce is return on capital employed, der is debt/equity ratio, per is p/e ratio, promopre is promoter holding pre-issue and promopost is promoter holding post issue.

2.5. Cross-Sectional Models

In a sample of 1,155 IPOs across 17 sectors, the distribution shown in Table 2 reveals that the manufacturing sector has the highest percentage (22.42%), followed by IT (12.38%) and pharmaceuticals (8.68%), while hospitality (1.81%) and automobiles (1.81%) have the lowest.

It can be observed from Table 2 that the manufacturing sector is the largest, representing over 22% of the total, indicating a robust industrial presence. Following closely are the IT and pharmaceuticals & healthcare sectors, which comprise approximately 12% and 9%, respectively, highlighting an increasing emphasis on technology and healthcare. Moderate representation is seen in the financial services, retail, and miscellaneous sectors, each accounting for around 6-8% of the companies. Meanwhile, smaller sectors such as consumer goods, logistics & transportation, infrastructure, energy, and real estate & construction make up about 3-5% of the total.

In this study, to understand the differences at the sectoral level and confirm the relationship among top sectoral IPOs, the study considered the manufacturing (N=259), information technology (N=143) and pharma & healthcare sector's (N=100) IPO performance in both formal and informal markets. In this model the study considered LDG% and GMP% as the dependent variables and others as predictors.

Table 2. Sector-wise Sample Size of the study

Code	Sector	Count	%
1	Financial Services	78	6.753%
2	IT	143	12.381%
3	Pharmaceuticals & Healthcare	100	8.658%
4	Consumer Goods	56	4.848%
5	Energy	39	3.377%
6	Real Estate & Construction	42	3.636%
7	Manufacturing	259	22.424%
8	Media & Entertainment	34	2.944%
9	Retail	71	6.147%
10	Metals & Mining	24	2.078%
11	Agriculture	38	3.290%
12	Logistics & Transportation	50	4.329%
13	Hospitality & Tourism	21	1.818%
14	Infrastructure	51	4.416%
15	Textiles	41	3.550%
16	Misc	87	7.532%
17	Automobile	21	1.818%
		1155	

$$ldg\%_{mft,it,ph} = a + \beta_1\,(gmp\%) + \beta_2\,(nmr) + \beta_3\,(vix) + \beta_4\,(nii) + \beta_5\,(rii) + \beta_6\,(ta) + \beta_7\,(ip) + \beta_8\,(roce) + \beta_9\,(de) + \beta_{10}\,(per) + \beta_{11}\,(promopre) + \beta_{12}\,(promopost) + \mu_i \quad (9)$$

$$gmpt\%_{mft,it,ph} = a + \beta_1\,(ldp) + \beta_2\,(nmr) + \beta_3\,(vix) + \beta_4\,(nii) + \beta_5\,(rii) + \beta_6\,(ta) + \beta_7\,(ip) + \beta_8\,(roce) + \beta_9\,(de) + \beta_{10}\,(per) + \beta_{11}\,(promopre) + \beta_{12}\,(promopost) + \mu_i \quad (10)$$

3. Empirical Results and Discussions

The study uses OLS regression to present results categorized into market factors, issue-specific factors, grey market factors, and firm-specific factors. It employs both aggregate and specific factor models to analyse how independent variables influence listing day performance and grey market premium.

In Model 3, results show that both market-specific and firm-specific variables significantly impact IPO performance on their listing day, measured through Listing Day Price (LDP) and Listing Day Gain% (LDG%). The analysis shows that the LDP is strongly influenced by the Gross Market Price (GMP%), which has a positive effect of 84.55%. This confirms the grey market premium's significant impact on listing day performance. Other factors, including Issue Price (IP), Net Institutional Investment (NII), pre-issue Promoter Holdings (Promopre), and Return on Capital Employed (ROCE), also positively influence the LDP, though to a lesser extent. In contrast, Retail Investor Interest (RII) and the Debt-to-Equity Ratio (DER) negatively affect the LDP. Overall, the model demonstrates a strong explanatory power with an R-squared value of 92.9%.

We confirm the results for Model 4 as well, particularly the predictive strength of GMP% (R^2=70.5%) on the listing day performance.

In Model 5, we examine the factors that influence the GMP%. Our findings show that Total Assets (TA), Input Price (IP), Net Institutional Investors (NII), Retail Individual Investors (RII), Promoters holding in Pre-issue (Promopre), Return on Capital Employed (ROCE), Debt-to-Equity Ratio (DER), and Listing Day Price (LDP) all have a statistically significant impact on GMP%.

This confirms that both company-specific and market-specific factors directly affect the grey market premium in the informal market. In the specific factor model, it is found that, except for the volatility index, all other variables have a statistically significant influence on the GMP%. Issue-specific factors have strong explanatory strength (R^2=57.7%) on the changes in the GMP%, followed by firm-specific factors (R^2=20.1%). However, the predictive strength of market factors is very low (R^2=.14 %).

Table 4. OLS regression results of Listing Day Performance and Grey Market Premium

Predictors	Aggregate Factor Model			Specific Factor Model		
	Model 3: DV=LDP N=1155	Model 4: DV=LDG% N=1155	Model 5: DV=GMP% N=1155	Model 6: DV=GMP% N=1155	Model 7: DV=GMP% N=1155	Model 8: DV=GMP% N=1155
	β	β	β	β	β	β
Intercept	-81.292	-0.1	0.053	0.225	0.106	0.357
Market Factors						
VIX	12.589	0.103***	-0.032	0.004		
NMR	56.384	0.249	-0.039	0.36*		
LDP	-	-	0.000***	0.008***		
Issue-Specific Factors						
TA	0.000***	0,000	0.000***		0.009***	
IP	1.111***	-0.045	0.003***		-0.018***	
NII	0.122***	0.000***	1.000***		0.019***	
RII	-0.110***	0.001***	0.001***		0.001***	
Grey Market Factor						
GMP%	84.559***	0.705***	-			
Firm-Specific Factors						
Promopre	1.100***	0.002	-0.001***			-0.001***
Promopost	-0.319	0.009	0.001			0.003***
ROCE	0.559***	0.004***	0.003***			0.009***
DER	-39.155***	-0.083***	0.034***			0.002
PER	0.005	0	0.003			-0.014***
R^2	0.929	0.53	0.609	0.014	0.577	0.201
AIC	13676	363	-831	219	-756	-19.3
DW Stat	1.84	1.89	2.09	1.79	2.04	1.88
F	1246	107	148	5.66	392	57.9

*, **, and *** represent the 10%, 5%, and 1% two-tailed significance level, respectively.

Table 5 highlights the sectoral differences in the variables affecting the Listing Day Gain (LDG) and the Grey Market Premium (GMP%). In the IT sector, the model variables account for 66.1% of the variation in LDG for IPOs. Specifically, the promopre in the formal IPO market and the GMP% are significant factors influencing LDG in this sector. For the Pharma and Health sector, 52.2% of the variation in LDG can be explained by the model variables. Here, the VIX, NII, ROCE, and GMP% significantly impact LDG. In the manufacturing sector, the model variables explain 63% of the variation in LDG for IPOs. In this sector, VIX, NII, and DER have shown to have a significant positive influence on LDG.

When analysing the predictability of various factors on the Grey Market Premium (GMP%) across different sectors, it is observed from table 5 that 71.8% of the changes in GMP% for IT sector IPOs can be explained by the model variables. Factors such as TA, IP, RII, Promopre, Promopost, and ROCE have a significant influence on GMP%. For IPOs in the Pharma and Health sector, 65.9% of the changes in GMP% can be explained by the model variables. Important factors in this sector include TA, IP, RII, DER, and LDP. In the Manufacturing sector, 69.0% of the changes in GMP% can be attributed to the model variables, which include TA, IP, RII, Promopost, ROCE, DER, and LDP.

Table 5. Regression results of the sectoral sample

Sector	Information Tech		Pharma & Health		Manufacturing	
	DV=LDG% N=143	DV=GMP% N=143	DV=LDG% N=100	DV=GMP% N=100	DV=LDG% N=259	DV=GMP% N=259
Predictor	β	β	β	β	β	β
Intercept	-0.357	0.344	-0.034	0.059	-0.017	-0.033
TA	0.000	0.000***	0.000	0.000***	0.000	0.000***

Sector	Information Tech		Pharma & Health		Manufacturing	
	DV=LDG% N=143	DV=GMP% N=143	DV=LDG% N=100	DV=GMP% N=100	DV=LDG% N=259	DV=GMP% N=259
VIX	0.036	-0.031	0.332***	-0.026	0.248***	-0.037
NMR	-0.240	-0.605	0.361	0.052	0.513	-0.173
IP	0.005	0.000***	0.005	0.001***	0.001	0.004***
NII	0.000	0.000	0.001***	0.000	0.000***	0.008
RII	0.000	0.001***	0.001	0.001***	0.000	0.001***
Promopre	0.007***	-0.007***	0.003	-0.001	0.002	-0.002
Promopost	-0.005	0.004***	-0.005	0.001	-0.003	0.003***
ROCE	0.004	0.009***	0.008***	0.002	0.000	0.007***
DER	-0.061	0.019	-0.077	0.053***	-0.074***	0.044***
PER	0.001	0.000	0.000	0.001	0.007	0.000
GMP%	1.129***	-	0.942***	-	1.173***	-
LDP	-	0.000		0.000***	-	0.001***
R^2	0.661	0.718	0.522	0.659	0.633	0.691
AIC	87.2	-95.8	-11.1	-190	113	-228
DW Stat	2.23	1.98	2.07	2	2.23	
F	21.1	27.6	7.91	14	35.4	45.8

, **, and * represent the 10%, 5%, and 1% two-tailed significance level, respectively.*

3.1. Issue Price Effect on GMP and LDG

Understanding the role of IPO price band and its relationship with IPO subscription decisions, particularly of Retail Individual Investors (RIIs) and Non-Institutional Investors (NIIs) is imperative.

Table 6. Issue size effect on Listing Day gain and grey market premium

Predictor	IP<250		IP>250,<500		IP>500	
	DV=LDG% N=900	DV=GMP% N=900	DV=LDG% N=135	DV=GMP% N=135	DV=LDG% N=120	DV=GMP% N=120
	β	β	β	β	β	β
Intercept	-0.209	0.034	-0.004	0.164	-0.015	0.208
TA	0.000	0.000***	-0.002	0.000***	-0.002	0.000***
VIX	0.124***	-0.038	0.016	-0.061	0.017	-0.057
NMR	0.196	-0.027	0.714	-0.363***	0.267	-0.219
IP	0.000	-0.003***	0.000	0.003***	-0.006	-0.001***
NII	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***
RII	0.001***	0.001***	0.002	0.001***	0.002***	0.001***
Promopre	0.003	0.000	-0.016***	0.004***	-0.012***	0.002
Promopost	-0.001	0.006	0.018***	-0.006***	0.015***	-0.004
ROCE	0.004***	0.005***	0.005	-0.004***	0.004	-0.004***
DER	-0.097***	0.099***	-0.098	0.032	-0.075	0.004
PER	0.001***	0.003***	-0.002	0.000	-0.004	0.000
GMP%	0.711***	-	0.986***	-	0.826***	-
LDP	-	0.002***	-	0.000***	-	0.000***
R^2	0.534	0.683	0.644	0.796	0.675	0.804
AIC	383	-693	-53.8	-233	-68.4	-275
DW Stat	1.94	2.06	1.59	1.84	1.55	2.01
F	84.7	159	12.5	26.9	18.5	36.5

*, **, and *** represent the 10%, 5%, and 1% two-tailed significance level, respectively.

Retail investors often shy away from high price band IPOs as compared to institutional investors, resulting in their reduced participation in both formal and informal markets (Deng & Zhou, 2015). NIIs and Qualified Institutional Buyers (QIBs) possess greater bargaining power due to their larger investment volumes, allowing them to influence prices and participate in higher-priced IPOs. Despite low volumes, RIIs participate in the grey market seeking higher returns. Often, institutional investors stay away from grey markets due to regulations. This volume differentiation affects the GMP and LDGs. This study aims to examine how various factors affect the LDG% and GMP% within a specified price band. Based on the mean observations, it is noted that the categorical price band ranges are as follows: less than INR 250, between 250 and 500, and above 500.

It can be observed from the empirical results of the OLS-based regression models 9 and 10 that the predictive strength of the grey market is weaker for issue prices (IP) under 250 compared to higher price ranges. Notably, the grey market premium (GMP%) demonstrates a higher R-squared value of 80.4% when the issue price exceeds 500. In contrast, this value drops to 68.3% for issue prices below 250. However, the model fits better for issue prices between 250 and 500. This analysis confirms the impact of the issue price on the listing day gain (LDG) and grey market premium (GMP).

3.2. Impact of Digital Adoption and Foreign Investments

Emerging markets are experiencing a significant increase in digital adoption, as evidenced by the growth in digital payments (Digipay). This trend indicates that entering and exiting capital market transactions has become easier. Another strong indicator of capital market growth is the rise in new dematerialized (Newdemat) accounts being opened, which suggests a potential increase in trading volume and demand for initial public offerings (IPOs). The increase in digital adoption and the number of new accounts in the capital markets directly impact volumes from Retail Individual Investors (RII), Non-Institutional Investors (NII), and the total number of applications received for IPOs. From a macroeconomic perspective, factors such as Net Portfolio Investment (NPI) and Net Foreign Direct Investment (NFDI) have a direct influence on trading in both grey and formal market systems.

$$ldg\% = a + \beta_1\,(npi) + \beta_2\,(nfdi) + \beta_4\,(digipay) + \beta_5\,(newdemat) + \mu_i \quad (11)$$

$$gmp\% = a + \beta_1\,(npi) + \beta_2\,(nfdi) + \beta_3\,(digipay) + \beta_4\,(newdemat) + \mu_i \quad (12)$$

Table 7. Table showing the effect of digital adoption on listing day gain and grey market premium

Predictor	Digital Adoption & FI	
	DV=LDG% N=1155	DV=GMP% N=1155
	β	β
Intercept	0.968	0.848
Digipay	-0.013	-0089
Newdemat	-0.049**	-0.042***
NPI	-0.013	-0.008
NFDI	0.056*	0.048***
R^2	0.174	0.194
AIC	49.6	28.5
DW Stat	2.28	2.01
F	3.06	3.5

Note. H_a μ Measure 1 - Measure 2 ≠ 0

*, **, and *** represent the 10%, 5%, and 1% two-tailed significance level, respectively.

Table 7 presents regression results for the impact of digital adoption on LDG% and GMP% for a sample of 1155 observations. The R^2 values are relatively low (0.174 for LDG% and 0.194 for GMP%), indicating that the models explain a limited proportion of the variance in the dependent variables. We observe opening of new demat accounts is marginally significant for LDG% (β = -0.049, p = 0.052) and significant for GMP% (β = -0.042, p = 0.047). The negative coefficients suggest that an increase in new demat is associated with a decrease in both LDG% and GMP%. NFDI is marginally significant for LDG% (β = 0.056, p = 0.097) and significant for GMP% (β = 0.048, p = 0.049). The positive coefficients suggest that an increase in NFDI is associated with an increase in both LDG% and GMP%. Digipay and NPI are not significant for either LDG% or GMP%, signifying that there is no statistically significant relationship.

Table 8 exhibits the paired Samples t-test results, it can be observed that LDG vs. GMP% the p-value is insignificant, which suggests that the null hypothesis (H_0: μ LDG - μ GMP% = 0) cannot be rejected. This

indicates no significant difference between the means of LDG and GMP%. As the means are equal, it confirms that LDG% and GMP% are highly correlated and GMP% can act as a strong predictor for LDG%.

Table 8. The paired samples t-test results of digital adoption on listing day gain and grey market premium with size effect

Pairs		Student's t	Wilcoxon W	Cohen's d	Rank biserial r
		Statistic		Effect Size	
LDG	GMP%	-0.408	272112***	-0.012	-0.185
Newdemat	NII	-5.576***	278***	-0.6617	-0.782
	RII	-5.817***	307***	-0.6904	-0.76
Digipay	NII	27.822***	2016***	3.5053	1.00
	RII	27.822***	2016***	3.5053	1.00

However, wilcoxon's median statistics are significant, and therefore null is rejected, confirming there is a significant difference. With regard to Newdemat vs. NII the p-value is less than 0.001, which suggests that the null hypothesis (H_0: μ Newdemat - μ NII = 0) can be rejected. This indicates a significant difference between the means of Newdemat and NII. The p-value for Newdemat vs. RII is less than 0.001, and thus the null hypothesis (H_0: μ Newdemat - μ RII = 0) is rejected, indicating a significant difference between their means. Similarly, the p-value for Digipay vs. NII is also less than 0.001, and thus the H_0 (H_0: μ Digipay - μ NII = 0) is rejected and showing a significant mean difference. Additionally, for Digipay vs. RII, the p-value is less than 0.001, confirming a significant difference between their means as well.

Conclusion

This study attempted to verify the factors influencing IPO grey market premium and listing day gains in India. Further, it examines the role of the issue price effect and digital adoption on the grey market premiums and listing day gains. Firstly, the relationship between IPO grey market and listing day performance is quite evident. Findings confirm that IPO grey market premium has an influence on listing day performance and thus validates the existence of price anomalies in the formal IPO market in India. The grey market premiums attract retail participation with speculative motives driving the sentiments based on anticipated demand and supply for trade. It is confirmed that the grey market sentiments significantly affect listing day performance and signals, in most cases, the under-pricing phenomenon. Though the debate over the necessity of shadow markets continues, as determining fair IPO prices remains challenging due to limited information for retail investors. Secondly, the grey market premiums are influenced by market volatility, return on capital employed, and price earnings ratio. It confirms that pre-issue financial performance indicators and institutional subscription rates are key determinants of grey market prices. Additionally, non-financial direct investment impacts IPO pricing, while new demat accounts, digital payments, and the New Payment Infrastructure (NPI) do not significantly affect GMP or listing day gains.

This study enhances our understanding of price discovery in the IPO market. Price discovery fundamentally depends on the demand and supply of shares, as well as company-specific information. A novel finding of this research is that, in addition to these factors, the grey market serves as a proxy for prices, influencing investor sentiment on the listing day gains. The findings of this study strongly validate expectancy theory and asset pricing principles. Furthermore, this study's findings establish a strong foundation for understanding the information asymmetry and price irregularities between formal and informal markets that investors should consider in the IPO market.

Policy Implications and Further Research

This study provides compelling evidence of how the grey market impacts IPO listing day prices and urges the attention of policymakers to formulate strategies to eliminate grey market influence and price discrepancies. Attempts are needed to avoid short-selling and limit speculative activities that can destabilize the IPO market. Listing day or week early gains are often not sustainable. Due to greed or anxiety of a price fall, investors engage in profit-bookings. The prices tend to fall sharply in the days that follow. Efforts are needed to curb the grey

market, which is largely intended for speculative activities. IPO markets should reflect a fair price for stocks and encourage long-term investments.

Scope for Further Research

This study does not provide liquidity and volatility-related aspects of the IPO market. This provides avenues for future research focused on understanding the intricacies of liquidity and volatility that occur on listing days. Beyond the influence of market dynamics and firm-specific characteristics, it would be beneficial to explore various macroeconomic factors that may also play a significant role in these phenomena. Such investigations could provide a more comprehensive understanding of the market environment during these critical periods.

Credit Authorship Contribution Statement

Suresha B: Conceptualization, Investigation, Methodology, Project administration, Software, Formal analysis.
Krishna T. A: Methodology, Software, Formal analysis, Writing – original draft, Data curation, Validation.
Elizabeth Renju Koshy: Writing – review and editing, Methodology, Supervision, Visualization.
Rejoice Thomas: Supervision, Data curation, Validation, Writing – review and editing, Visualization.
Karthick C: Supervision, Data curation, Validation, Writing – review and editing, Visualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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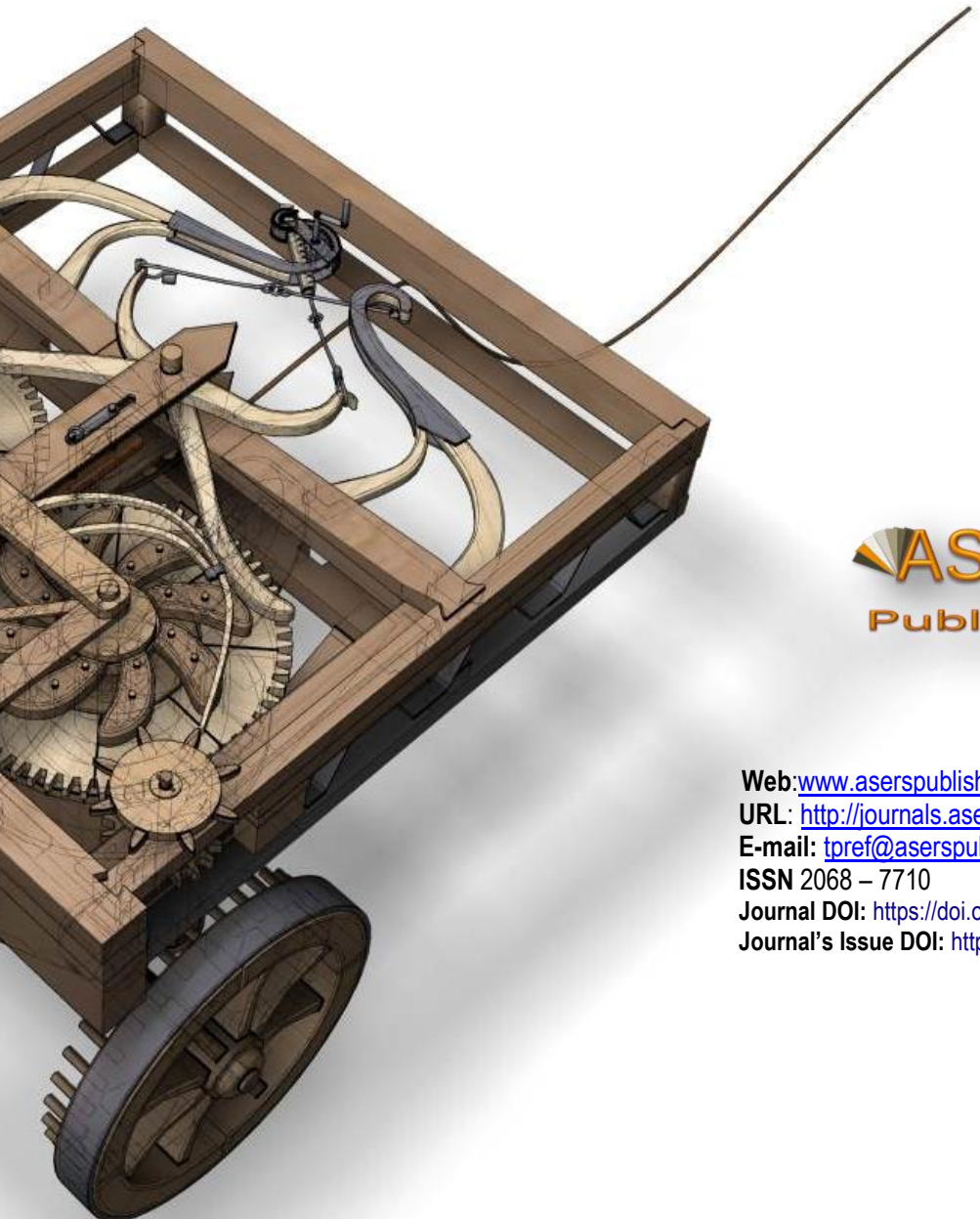

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