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Role of market timing and market conditions: Evidence from seasoned equity offerings

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ABSTRACT

In this paper, we examine the impact of *market timing* versus *market conditions* hypotheses on the equity issuance decisions of SEO firms. Indian initial public offerings and secondary equity offerings market provide a perfect setting to test this phenomenon. We examine BSE and NSE listed 970 SEOs during 20-year time period. We use direct as well as indirect measures to examine our hypotheses and the results show that in India, there is evidence for both market timing and market conditions hypotheses for SEOs. Hence, for firms issuing SEOs in India, market timing as well as market conditions are important. The results of negative long run performance of SEOs support firm specific as well as aggregate market timing. Also, market timing by SEOs is strong during hot issue period compared to the cold issue period. Our regulatory regime-wise analysis show that, in the regulatory era there is evidence for market timing and market conditions for SEO issuance, albeit weak whereas for the non-regulatory era firms issue equity to time the market only.

1. Introduction

One of the most important motives of a firm to go public is to raise capital to finance new projects. There is a transfer of wealth from new shareholders to existing shareholders in case the equity is overvalued. Due to this process, the firm insiders make a gain at the expense of the new owners of equity. This phenomenon is termed as ‘Market Timing’ in the extant literature. More generally, it is the process of selling equity when it is overvalued and buying equity when it is undervalued. This process continues till the stock price attains its fundamental value. According to the literature on market timing, firms have two different motives to time the market. First, firms look for the right time when the market valuations are high to issue equity. Second, firm insiders issue equity to take advantage of over-optimistic investors who believe that future growth of the firm is strong and they can make considerable gains. Nonetheless, this argument is not acceptable to those who have faith in efficient market hypothesis following new equity issuance. These market participants believe that managers do not possess market timing skills and can sell overvalued equity to uninformed investors with their superior information. However, they argue that firms issue equity when there is economic growth, markets are bullish and there is a better demand for equity because of higher growth prospects. This phenomenon is termed as market conditions hypothesis. There is no consensus in the existing literature on whether new equity issuances are driven by market timing or market conditions hypothesis.

The main aim of this paper is to study the impact of market timing and market conditions phenomenon on equity issuance decisions of SEO firms. To the best of our knowledge this is the first study to show evidence of the above phenomenon for an emerging

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order driven market SEOs. Indian primary markets provide an ideal setting to examine market timing versus market conditions hypothesis because of two main reasons. Firstly, the literature on the US markets (example, [Purnanandam and Swaminathan, 2004](#)) shows that most underpriced U.S. IPOs/SEOs are overvalued to a large extent. But, in India, we have little evidence of this in SEO/IPOs. However, whether Indian primary equity issuances are overvalued or not is yet to be tested. Secondly, for the Indian market, the equity issues increase with increase in market returns and vice versa which could be an evidence of market timing. Also, the number of SEOs is quite high after the reform regulated era post 1996 where the overall demand for capital is very high and this may be an evidence for market conditions hypothesis.

We use both direct and indirect tests of market timing to test our objectives. An indirect test of market timing is tested by examining the long-run stock performance and a decline in this confirms there is presence of market timing. The extant literature has documented the long-run¹ underperformance of firms issuing equity through SEOs and IPOs which lead to the understanding that managers time the market by selling equity when it is overvalued. However, these studies have been criticized for two reasons. The first criticism comes from the methodological perspective that the previous studies which tested long-run stock underperformance have used event-time approach to capture abnormal performance, which has major drawbacks². Hence it is encouraged to use calendar-time approach ([Mitchell & Stafford, 1998](#); [Schultz, 2003](#)). The second issue is that even though it has been shown that managers do not possess market timing skills, there is successful market timing by the firms ([Schultz, 2003](#)). The direct tests of market timing and market conditions hypotheses are related to a positive association of market timing variables and market conditions variables quantified with equity issuance. We examine both direct and indirect tests on SEO firms in our study. Since, SEOs are very few in number as compared to IPOs and according to their clustering in different years, we classify whole time period of SEOs into two sub-period regimes: Regime I i.e. 1991–1996 and Regime II i.e. 1997–2012. Regime I is post liberalization era in which very few SEOs took place in India and Regime II is initial regulated and reformed regulated regime in which maximum SEOs took place in India.

Our indirect tests of market timing vs pseudo market timing based on univariate analysis report negative BHARs in the range of -8.8% to -2.3% for different quarters. Also, a high underpricing in SOEs is reported. These results clearly indicate the existence of firm-specific market timing for the whole time period as well as for the two time regimes. However, the regime-wise analysis show evidence of aggregate market-timing for regime I, but very little evidence for regime II. These results are due the government intervention in terms of regulations in regime II that created entry barriers for SEO firms to gain advantage from overall market valuations. However, the firms could cash on the firm-specific overvaluation. The regime-wise results are supported by our regressions analysis too. The direct tests further support our indirect tests. When we include market timing variables along with market conditions variables in our regressions, we find a strong evidence of market conditions hypothesis and weak evidence of market timing hypothesis. Our long-run performance results using calendar time portfolio regressions show that for the overall time period SEOs exhibit a negative return of 4%. Regime I exhibit a negative return of 5–6% and regime II exhibit a negative return of 4–6%. These results corroborate our earlier results. Hence, for firms issuing SEOs in India, market timing as well as market conditions are important. The results of negative long run performance of SEOs support firm specific as well as aggregate market timing. Also, market timing by SEOs is strong during hot issue period compared to the cold issue period. Our regulatory regime-wise analysis show that, in the regulatory era there is evidence for market timing and market conditions for SEO issuance, whereas for the non-regulatory era firms issue equity to time the market only.

Our study makes several contributions to the extant literature on IPOs as well as the market timing literature. The current study is the first study to examine the phenomenon of market timing versus market conditions hypothesis for an emerging market, India as Indian primary markets provide an ideal setting to test the above hypothesis as mentioned earlier and adds to the literature. To the best of our knowledge, our study is the first study to test market timing versus market conditions hypothesis using direct as well as indirect tests for SEOs which helps us overcome the methodological drawbacks reported in previous studies. Our study contributes to the prior literature by examining the above question in two regulatory regimes. In this way, it helps us to understand the impact of regulations on market timing and market conditions variables. Finally, to the best of our knowledge, ours is the first study to tests market timing in SEOs for hot and cold market states. This throws light on the impact of market states on market timing and market conditions variables.

The rest of the paper is organized as follows. [Section 2](#) provides review of literature on market timing and pseudo market timing hypotheses. [Section 3](#) describes the data, variable construction and methodology. Empirical results are discussed in [Section 4](#) and the last section concludes the paper.

2. Related literature

The question of why firms issue equity has been a favorite topic among researchers over the years, yet with inconclusive evidence. On one hand, we have the *Market timing hypothesis* which posits that firms issue equity to time the market and indulge in opportunistic behavior and sell equity when overvalued and vice versa. Contrary to this, we have the *Market Conditions hypothesis* which shows evidence that market conditions play a role in the equity issuance decision of a firm. These competing hypotheses are tested in two

¹ The performance in terms of stock returns over a period of 3–5 years is considered as long-run performance.

² Event-study methodology assumes that any lag in the response of prices to an event is short term. As information gets adjusted in prices slowly, one must examine returns over longer horizons which can give fair view of market efficiency. To overcome this problem, calendar-time approach is suggested to examine long-run performance.

different ways in the extant literature; direct and indirect tests. The underperformance (negative performance) of the firm in the long run is a sign of market timing and a positive or a neutral performance supports market conditions hypothesis. These two strands of literature are presented here.

The first study to examine market timing in IPOs is given by Ritter (1991). He uses indirect test on 1526 US IPOs which issued equity during 1975–1984 period and show that firm managers time the market to exploit “windows of opportunity”. The paper uses cumulative average adjusted returns (CAARs) and three years buy and hold returns (BHRs) in different set-ups: firm-wise, industry-wise, year-wise, gross proceeds-wise and age-wise. The results show evidence for underperformance in all the cases, albeit with varying degree. Supporting Ritter (1991), Loughran and Ritter (1995) show evidence for long-run under performance for sample of US IPOs and SEOs for the period 1970 to 1990. They use three and five year BHRs and show that IPOs and SEOs underperform in the long-run. The results of Fama and French (1993) time series regressions also support long-run underperformance. Loughran and Ritter (1997) with the help of 1338 SEOs for the period 1979–1989 extend the work of Ritter (1991) and Loughran and Ritter (1995) and show that SEO firms perform poorly in terms of generating stock returns as well as there is a decline in their operating performance. They conclude that managers take advantage of over-optimistic investors with respect to the future prospects of the firm and hence issue over-valued equity. Brav, Geczy, and Gompers (2000) use improved methodology of calendar time regressions and show that IPOs underperform in the long run but, there is no conclusive evidence related to SEOs.

Baker and Wurgler (2000) look at market timing ability of managers from the premise that events predict future returns. They examine data related to equity and debt for a long time series during 1927–1996 to analyze role of equity with other market return predictors such as M/B ratio and dividend yield. They show that equity is a better predictor among all the return predictors and it is consistent across time. Also, they find that firms issue equity prior to low return periods and issue debt prior to high returns periods. Overall, their results show a negative relationship between equity issuance and subsequent market returns which shows that equity issuance predicts negative market returns. Similar to Baker and Wurgler (2000), Lowry (2003) with direct tests shows evidence for market timing in US IPOs from the negative correlation of quarterly IPO volume with post-issue quarterly returns. Aydogan (2006), Baker and Wurgler (2002) also use direct test to examine market timing hypothesis. Their results show that hot market has a positive relationship with amount of equity proceeds and number of equity issues.

The literature in the previous section provides literature on market timing hypothesis and concludes that managers time the market due to their superior insider information. However, Schultz (2003) is the first paper to argue that markets are efficient and managers do not possess market timing ability. According to the paper, firms issue more equity when they expect to receive higher price for their equity which is possible in a booming market. Using a simulated model, he shows that managers react to market-wide information and issue equity believing that markets are inefficient even though they are efficient. In this context, equity issuance is determined at higher prices ex post despite the fact that managers cannot estimate the higher prices ex ante. This is termed as “Market conditions hypothesis”.

Lowry (2003) observes volatility in IPO volume across time and tries to understand whether these variations are explained by factors related to market efficiency or inefficiency. The paper examines 5349 US IPOs for the period 1960 to 1996 and shows that IPO volume is positively associated with various factors of economic growth, new business development and also more efficient market characteristics such as less information asymmetry. She also shows that most important factors which contribute to the variation in IPO volume are market demand and variables influencing investor sentiment.

Chan, Ikenberry, and Lee (2007) test Schultz (2003) market conditions hypothesis in the context of share repurchases to examine whether managers time the market through equity repurchase decisions. The paper is motivated from the previous research which shows that firms provide positive abnormal performance in the long-run post the repurchase activity. Using calendar time regressions on a sample of 5508 buyback offers during the period 1980–1996, they provide evidence for market timing instead of market conditions. Contrary to Schultz (2003), Gregory, Guermat, and Al-Shawawreh (2010) test behavioral market timing versus market conditions hypothesis in the context of UK IPOs and find significant long-run underperformance which is an evidence of market timing, both with event-time and calendar time approaches. Another study to test the market timing against market conditions hypothesis is by Ball, Hui Chiu, and Smith (2011). They analyze this in the context of venture capitalists’ exit via IPOs and acquisitions. The results based on univariate analysis of aggregate and firm-specific market timing variables are consistent with market conditions hypothesis with a weak evidence of market timing in biotech sector IPOs. Multivariate results are also more consistent with market conditions.

As explained above, there is mixed evidence related to market timing versus market conditions hypothesis as well as very little evidence for SEOs. There is even lesser evidence of this issue in the context of emerging markets. Our paper tries to address these issues.

3. Data, variable definitions and methodology

3.1. Data

The time period of our analysis is from 1991 to 2015. We analyze the SEOs for the period of twenty years during the period 1991–2012. The number of SEOs during the period is 970. We do not consider the SEOs after the 2012 period as the long run performance analysis requires three years of data after the equity issuance. The data set for SEOs and their associated variables for our analysis is constructed using Prime and Thomsonone Databases. The data on stock prices, firm level variables as well as other related variables are collected from PROWESS database and that of macroeconomic variables is taken from Business Beacon and EPWRF. Since, SEOs are very few in number as compared to IPOs and according to their clustering in different years, we classify

whole time period of SEOs into two sub-period regimes: Regime I i.e. 1991–1996 and Regime II i.e. 1997–2012. Regime I is post liberalization era in which very few SEOs took place in India and Regime II is a combination of initial regulated and reformed regulated regime in which maximum SEOs took place in India.

3.2. Variable construction

In this section, we describe the construction of the variables which we use in the study. Number of equity issues is total number of SEOs in the time period from 1991 to 2012.

a) *Number and volume of equity issues*: Number of equity issues is total number of SEOs and volume is the total proceeds of SEOs. Number and volume are used in two ways. One, market wide number/volume of equity issues represented by *MktSEOs* is total number/volume of SEOs in the overall market. We follow the CMIE³'s (Centre for Monitoring Indian Economy) industry sector classification for our study.

b) *Aggregate Market Timing Variables*: The variables which we use to test aggregate market timing are market returns and market wide market-to-book ratio. Market return is computed as the gain or loss of the overall stock market in a particular period of time. It is calculated as, $Return_t = \ln(Price_t/Price_{t-1})$ or $Return_t = (Price_t - Price_{t-1})/Price_{t-1}$.

We use COSPI index return as a proxy of market return and return of sector indices maintained by CMIE as proxy of sectors return. We follow Lowry (2003) procedure to calculate market wide market-to-book ratio which is represented by *MktM/B*. It is the equally weighted average of *M/B* of all listed firms, where market value (stock price multiplied by number of shares outstanding) *M* is measured at each quarter end and book value *B* (which is equal to Total Shareholders' funds – Preference Capital + Deferred taxes) is measured at the end of fiscal year in which equity is issued.

c) *Firm-Specific Market Timing Variables*: The variables which we use to test firm-specific market timing are: initial returns of the issuer and post-issue adjusted returns of issuer. Initial returns which is also known as underpricing.

d) *Variables reflecting market conditions/pseudo market timing variables*: The variables reflecting market conditions which we intend to use in the study are: Market Index (BSE), P/E Ratio, GDP growth at constant prices, and T-Bill Rate. These variables are measured over specified intervals to capture changes in the overall market/economic conditions before the equity issuance. Index price/earnings (P/E) ratio reflects changes in the stock market before equity issuance. Growth rate is measured as percentage change in real gross domestic product (GDP) at constant prices before equity issuance is an indicator of growth of the economy. T-Bill rate which is also considered as risk free rate is considered to control inflationary conditions.

e) *Buy-and-Hold Returns*: Buy-and-hold returns is a proxy of long-run returns on market index or stock which is based on the assumption of investing in market index or stock and holding it over a period of time. Buy-and-hold returns are calculated by compounding returns for a specified period of time.

f) *Risk-Free Rate*: The proxy of risk-free rate which is used in the study is one-year Treasury Bill rate. The evidence for market timing is analyzed as follows: (1) Negative BHARs of the issuers in post-equity issuance period; (2) Higher underpricing; (3) Market returns in pre-equity issuance period are higher compared to post-equity issuance period; (4) Positive correlation of SEO activity with pre-issue market returns; (5) Negative correlation of SEO activity with post-issue market returns; (6) Positive association of SEO activity with underpricing; (7) Positive association of SEO activity with BHARs; and (8) Long-run underperformance of equity issuers in post-issue period. Market Conditions Variables: The evidence of market conditions hypothesis is examined as follows: (1) Positive correlation of SEO activity with market conditions variables; (2) No long-run underperformance of SEO firms in post-issue period. We follow Ball et al. (2011) methodology to analyze the impact of market timing and market conditions hypothesis for SEO firms.

3.3. Methodology

The association of equity issuance with market returns is our first test to examine aggregate market timing. A decline in the market returns from pre to post-issue period reflects aggregate market timing of SEO firms. We compute market return as cumulative daily returns over quarters one to four for pre and post issuance period. We test for the difference of means of market returns for $Qtr - 3 - 4$ vs. $Qtr + 3 + 4$, $Qtr - 4$ vs. $Qtr + 4$, $Qtr - 3$ vs. $Qtr + 3$, $Qtr - 2$ vs. $Qtr + 2$ and $Qtr - 1$ vs. $Qtr + 1$.

Market *BHR* is computed as follows:

$$\prod_{t=1}^T (1 + r_{mt}) \quad (1)$$

where (r_{mt}) is the proportional daily change in the price of market index for period $t = 1$ to T .

Here, we perform univariate analysis for two of the firm specific market timing variables; BHARs and Underpricing. BHARs are computed on a quarterly basis for four quarters; $Qtr + 1$, $Qtr + 2$, $Qtr + 3$ and $Qtr + 4$ and also cumulative BHARs for $Qtr + 3$ and $Qtr + 4$ represented by $Qtr + 3 + 4$. Both these tests are analyzed at the market level.

BHAR for firm i is estimated as follows:

³ CMIE is an Indian database having several products which provides financial data of Indian companies and also Indian macro-economic variables.

$$BHAR_i = \prod_{t=1}^T (1 + r_{it}) - \prod_{t=1}^T (1 + r_{mt}) \tag{2}$$

In the above equation, (r_{it}) is the proportional change in the price of security i for period t and takes value $t = 1$ to T .

We use regression analysis to examine the differences in market timing in two different SEO regulatory regimes; 1991–1996 (regime I) and 1997–2012 (regime II). In our regression model, we use market timing variables as the dependent variables and dummy variable representing the regime dummy. We estimate following regression equation to differentiate market timing in three regulatory regimes:

$$Y = \alpha + \beta_1 TD + \varepsilon \tag{3}$$

The above regression is estimated for three different specifications related to three different market timing variables. Here, $Y =$ Underpricing/BHARs/Difference between pre-issue market BHRs and post-issue market BHRs. TD is the regime dummy which takes value 1 if the SEO is in regime II or zero otherwise. As discussed above regime I SEOs are during the period 1991–1996 and regime II SEOs are for the period 1997–2012.

We examine the impact of aggregate- and firm-specific market timing as well as market conditions on SEOs using the following quarterly time series regressions:

$$MktSEOS_t = \alpha + \sum_{k=1}^4 \beta_k BHR_{t-k} + \sum_{k=1}^4 \beta_{k+4} BHR_{t+k} \beta_9 (MktM/B)_{t-1} + \beta_{10} UP_{t-1} + \sum_{k=1}^4 \beta_{k+10} BHAR_{t+k} + \beta_{15} \ln GDP_{t-1} + \beta_{16} \left(\frac{P}{E}\right)_{t-1} + \beta_{17} TBill_{t-1} + \varepsilon_t \tag{4}$$

The definition of the variables in Eq. (4) is given in the section on variable definitions. BHR_{t-k} is buy-and-hold market returns for four quarters prior to the issue and BHR_{t+k} ($BHAR_{t+k}$) is buy-and-hold market returns (market adjusted buy-and-hold-return) for four quarters post issue. COSPI index returns are used as a proxy for market returns. $MktM/B_{t-1}$ and UP_{t-1} are the market wide market-to-book ratio and average underpricing respectively of all the firms in the market which issued SEOs in the quarter prior to the SEO.

Recent studies in the literature recommend the use of calendar-time approach as against the use of event-time approach to measure the abnormal performance. It is shown that calendar time approach minimizes or completely eliminates underperformance. The basic difference between event-time and calendar-time methodology is that event-time weights equity offerings equally, while calendar-time approach weights months equally despite of the events cluster in time. Hence, to overcome the problems of event-time methodology, the long-run performance of SEOs is tested using calendar-time regressions. The abnormal performance of SEO firms after equity issuance is estimated by Carhart (1997) four factor model and Fama and French (1993) three factor models as given below:

$$R_{pt} - R_{ft} = \alpha + \beta_1 (R_{mt} - R_{ft}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 MOM_t + \varepsilon_t \tag{5}$$

In Eq. (5), R_{pt} is the monthly portfolio returns and R_{ft} is one year T-bill rate used as a proxy for risk-free rate. $isthemarketriskpremium$, is the market risk premium, SMB_t is the monthly return on portfolio of small stocks minus large stocks. HML_t is the monthly return on the portfolio of high B/M stocks minus low B/M stocks. MOM_t is returns on the portfolio of high momentum stocks minus low momentum stocks. We compute momentum from the prior one year returns. In EQ. (5), the abnormal performance is captured by the intercept α . All the factors are constructed by following standard methodology in the literature given by Fama and French (1993) and Jegadeesh and Titman (1993). These regressions have been estimated for a 36 month window.

4. Empirical results and discussion

The empirical analysis for the study is done in four stages; first, we perform univariate analysis to examine the hypothesis related to firm specific as well as aggregate market timing. As explained earlier, the evidence for firm-specific market timing is given negative BHARs and underpricing. A positive difference between pre- and post-issue market BHRs provide evidence for existence of aggregate market timing. This analysis is performed at aggregate level as well as for different regulatory regimes: Regime I (1991–1996), Regime II (1997–2012) for all SEOs. Next, we examine the differences in firm-specific as well as aggregate-market timing in different regulatory regimes through regression analysis. Third, we use regression analysis to examine the impact of firm-specific/aggregate market timing and market conditions hypotheses on SEO activity of firms. Finally, with calendar time regressions, for a period of three after the SEO we analyze the long-run performance.

4.1. Descriptive statistics and univariate analysis

The descriptive statistics of 970 SEOs of our study period are given in Table 1. The statistics are provided on aggregate level as well as on a quarterly basis. The average underpricing for SEOs is 482%. Surprisingly, this is very high compared to the average underpricing at aggregate level for IPOs is 78% and on a quarterly basis is 101% (Wadhwa, Reddy, Goyal, & Mohamed, 2016). Thus, we show that underpricing in SEOs is relatively very high compared to IPOs for the Indian market. The table also shows that on an average the pre-issue market returns are higher than the post-issue returns and the BHARs for the SEO firms are negative. The mean market-wide M/B ratio is greater than 1; showing evidence for firm-specific as well as market timing at the aggregate level. We provide further empirical evidence for this in the subsequent sections. GDP, P/E ratio of BSE Sensex and Tbill rate are market

Table 1
Descriptive Statistics on aggregate and quarterly SEOs.

Variable Name	Aggregate				Quarterly			
	Mean	Median	Std dev	No. of SEOs	Mean	Median	Std dev	No. of Quarters
UP	4.82	0.07	18.8	970	4.68	1.86	7.09	81
MBHR _(Q-1)	0.11	0.1	0.28	969	0.11	0.05	0.25	81
MBHR _(Q-2)	0.14	0.12	0.31	968	0.12	0.07	0.29	80
MBHR _(Q-3)	0.11	0.08	0.32	968	0.12	0.06	0.31	80
MBHR _(Q-4)	0.07	0.02	0.27	968	0.12	0.07	0.23	80
MBHR _(Q+1)	0.09	0.09	0.27	969	0.08	0.05	0.22	81
MBHR _(Q+2)	0.09	0.08	0.23	969	0.1	0.07	0.22	81
MBHR _(Q+3)	0.1	0.09	0.25	969	0.07	0.01	0.21	81
MBHR _(Q+4)	0.1	0.1	0.21	969	0.11	0.07	0.23	81
BHAR _(Q+1)	-0.09	-0.12	0.33	964	-0.14	-0.09	0.19	77
BHAR _(Q+2)	-0.03	-0.06	0.29	964	-0.07	-0.06	0.24	77
BHAR _(Q+3)	-0.05	-0.09	0.3	964	-0.07	-0.06	0.15	77
BHAR _(Q+4)	-0.04	-0.07	0.32	964	-0.04	-0.03	0.22	77
MktM/B					2.72	2.63	1.12	81
GDP (in billion)					5899.582	5326.43	2494.145	81
P/E					22.09	19.12	9.4	80
Tbill					0.08	0.07	0.02	80

This table reports the descriptive statistics of SEOs at aggregate level and quarterly level during 1991–2012. UP is the underpricing or average initial return. MBHRs are market buy-and-hold returns and are calculated using equally-weighted COSPI index over sixty trading days for four quarters both before and after the issuance of SEO. BHAR is the average buy-and-hold market adjusted returns of issuers calculated over sixty trading days after the SEO is issued beginning with Q + 1 through Qtr + 4. MktM/B is the quarterly market-wide market-to-book ratio. GDP is quarterly gross domestic product at constant prices, P/E is the quarterly price-to-earnings ratio of BSE Sensex and T-bill is the monthly T-bill rate at the end of each quarter.

Table 2
Univariate Analysis of market timing of SEOs in different regulatory regimes.

Time Period	No. of SEOs	Q + 1	Q + 2	Q + 3	Q + 4	Q + 3 + 4
<i>Panel A</i>						
1991–2012						
	970	BHARs -0.088 (-7.22)***	-0.027 (-2.43)**	-0.053 (-4.69)***	-0.036 (-2.98)***	-0.089 (-5.23)***
1991–1996	96	-0.272 (-10.1)***	-0.110 (-4.17)***	-0.072 (-3.5)***	-0.008 (-0.18)	-0.080 (-1.84)
1997–2012	874	-0.059 (-4.55)***	-0.014 (-1.15)	-0.050 (-3.96)***	-0.040 (-3.3)***	-0.091 (-4.9)***
<i>Panel B</i>						
Pre minus Post-Issue Market Buy-and-Hold Returns						
1991–2012	970	0.0155 (1.21)	0.0506 (3.44)***	0.0141 (0.82)	-0.0306 (-2.45)**	-0.0166 (-0.76)
1991–1996	96	0.0535 (1.78)*	0.1379 (4.07)***	0.2408 (6.62)***	0.1460 (4.48)***	0.3868 (7.41)***
1997–2012	874	0.0096 (0.68)	0.0371 (2.3)**	-0.0211 (-1.14)	-0.0580 (-4.4)***	-0.0792 (-3.45)***
<i>Panel C</i>						
Underpricing						
1991–2012	970	0.3154 (5.8)***				
1991–1996	96	0.7741 (6.06)***				
1997–2012	874	0.2427 (4.1)***				

The SEO sample includes 970 SEOs issued in India over the time period from 1991 to 2012. The whole time period is classified in two sub-period regimes: 1991–1996 (regime I); 1997–2012 (regime II). This table reports the results of univariate tests of BHARs of the issuer for four quarters after the SEO; market BHRs for four quarters before and after the SEO issuance. BHARs are the average buy-and-hold market adjusted returns of issuers calculated over sixty trading days after the SEO is issued beginning with Qtr + 1 through Qtr + 4. Qtr + 3 + 4 show the combined return of quarter 3 and 4. Market BHRs are calculated using equal-weighted COSPI index over sixty trading days for four quarters both before and after the issuance of SEO. *Panel A* shows the test of significance of means of average underpricing and average BHARs for whole time period and two sub-period regimes. *Panel B* shows the difference of mean test of four quarters prior to issuance of an SEO and four quarters after the issuance of the SEO. T-values are given in the parentheses. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

Table 3
Results of dummy variable regression of SEOs on the basis of regulatory regimes.

Dependent Variable	α	TD	R ²	F-Value	N
<i>Panel A</i>					
BHAR1	-0.2718 (-8.38)***	0.2125 (6.1)***	0.0494	37.18	718
BHAR2	-0.1098 (-3.69)***	0.0961 (3.00)***	0.0124	9.03	718
BHAR3	-0.0723 (-2.33)**	0.0219 (0.66)	0.0006	0.43	718
BHAR4	-0.0077 (-0.24)	-0.0325 (-0.92)	0.0012	0.85	718
BHAR34	-0.0800 (-1.72)*	-0.0105 (-0.21)	0.0001	0.04	718
<i>Panel B</i>					
Pre-Post_Qtr + 1	0.0535 (1.54)	-0.0440 (-1.17)	0.0019	1.38	723
Pre-Post_Qtr + 2	0.1379 (3.45)***	-0.1008 (-2.35)**	0.0076	5.50	722
Pre-Post_Qtr + 3	0.2408 (5.27)***	-0.2620 (-5.33)***	0.0380	28.41	722
Pre-Post_Qtr + 4	0.1460 (4.37)***	-0.2040 (-5.69)***	0.0430	32.32	722
Pre-Post_Qtr + 3 + 4	0.3868 (6.74)***	-0.4660 (-7.55)***	0.0734	57.00	722
<i>Panel C</i>					
Underpricing	0.7741 (5.3)***	-0.5314 (-3.38)***	0.0156	11.44	724

This table reports the regression results of the following regression equation: *PleaseCheck*

Panel A reports regression results of the above equation when the dependent variable is quarterly BHAR. Panel B reports regression results of the above equation when the dependent variable is difference between quarterly pre-issue and post-issue market BHR. Panel C reports regression results of the above equation when the dependent variable is underpricing. Market BHRs are calculated using equal-weighted COSPI index over sixty trading days for four quarters both before and after the issuance of SEO. The above regression makes use of one dummy variable: *TD*. *TD* take the value 1 if SEO is issued in regime II i.e. 1997–2012 or 0 otherwise. T-values are given in the parentheses. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

conditions variables and computed on a quarterly basis as the multivariate analysis is performed quarterly.

We consider underpricing as the average of initial returns of all the firms issues secondary equity in our sample period. BHARs are computed over sixty trading days following the SEO issue starting with Qtr + 1 through Qtr + 4 and also for Qtr + 3 + 4 (which is the total return during quarters 3 and 4). Similarly, Market-wide BHRs are computed using equal-weighted COSPI index during sixty trading days over four quarters both before and after the SEO and also for cumulative return of 3rd and 4th quarters (i.e. Qtr - 3 - 4, Qtr - 4, Qtr - 3, Qtr - 2, Qtr - 1, Qtr + 1, Qtr + 2, Qtr + 3, Qtr + 4 and Qtr + 3 + 4).

Table 2 presents the univariate analysis for market timing in SEOs for the total time period and also for the two regulatory regimes. The results of firm-specific market timing are reported in Panels A, Panel C and those of aggregate market timing variables in Panel B. As seen in Panel C the average underpricing of all SEOs is 31.54% and the BHARs reported in Panel A for Q + 1, Q + 2, Q + 3, Q + 4, and Q + 3 + 4 are -8.8%, -2.7%, -5.3%, -3.6%, and -8.9% respectively. These results clearly indicate the existence of firm-specific market timing for the overall time period. Similarly, the results of the two regimes indicate evidence of firm-specific market timing as all the BHARs are negative and underpricing is 77.41% and The analysis of two regulatory regimes indicate presence of strong firm specific market timing for Regime II and aggregate market timing for Regime I. This is shown by the positive and significant difference between pre- and post-issue market returns in quarter 4. These results indicate that due to the government regulations in Regime 2 created entry barriers for SEO firms to gain advantage from overall market valuations. However, the firms could take advantage of the firm-specific overvaluation.

4.2. Analyzing the differences in market timing of SEOs in different regulatory regimes

We examine the difference in market timing from one regime to the other regime. The analysis is carried out by using regression analysis where the dependent variable is market timing variable and dummy variables are used as independent variables to capture different time regimes, type of ownership, and industry type. Regression models are used to capture the differences in regulatory regimes for each of the market timing variables. As there are two firm-specific and one aggregate market timing variables, we run $3 \times 3 = 9$ regressions for SEOs (The tables of this section are available on request).

Table 3 reports regression results of Eq. (3) for SEOs. For SEOs, we have one regulatory regime dummy: *TD*. The *TD* dummy takes value 1 for time period 1997–2012, or zero otherwise. Intercept in Eq. (3) represents value of dependent variable for SEOs belonging to Regime I i.e. from 1991 to 1996. Panel A and Panel C show the strong evidence of firm-specific market timing as BHARs are less in

Table 4
Impact of market timing and market conditions on SEO activity for whole time period.

	All SEOs		
	Model I	Model II	Model III
Intercept	3.02 (797.21)***	− 36.62 (689.89)***	− 30.96 (69.67)***
LnGDP _(Q-1)		2.92 (884.38)***	2.56 (100.67)***
P/E _(Q-1)		0.05 (83.11)***	0.07 (69.1)***
Tbill _(Q-1)		9.94 (43.21)***	18.09 (16.11)***
UP _(Q-1)	0.39 (94.8)***		− 0.06 (0.97)
BHAR _(Q+1)	− 3.95 (260.82)***		− 0.11 (0.11)
BHAR _(Q+2)	− 0.58 (5.81)**		− 0.10 (0.10)
BHAR _(Q+3)	− 0.49 (2.56)*		− 0.69 (3.6)*
BHAR _(Q+4)	− 0.22 (0.8)		− 0.22 (0.63)
MBHR _(Q-1)	0.54 (11.00)***		0.29 (1.34)
MBHR _(Q-2)	0.16 (1.16)		0.43 (3.63)*
MBHR _(Q-3)	0.74 (23.23)***		0.34 (3.04)*
MBHR _(Q-4)	− 0.21 (1.8)		− 0.10 (0.37)
MBHR _(Q+1)	− 0.44 (5.46)***		− 0.47 (3.06)*
MBHR _(Q+2)	− 1.58 (57.34)***		− 0.51 (5.35)***
MBHR _(Q+3)	− 0.37 (3.32)**		0.22 (1.07)
MBHR _(Q+4)	− 1.80 (101.57)***		− 0.22 (0.96)
MktM/B _(Q-1)	0.19 (26.71)***		0.18 (7.83)***
LL	2638.87	3417.28	2978.51
Full LL	− 587.07	− 296.42	− 247.43
N	65	68	65

This table reports the regression results of Eq. (4) for whole time period of SEOs $MktSEO_t$ is the market-wide number of equity issues SEOs in each quarter in the given time period. BHR_{t-k} is pre-issue buy-and-hold market returns for each quarter starting from $t - 4$ to $t - 1$ and BHR_{t+k} is post-issue buy-and-hold market returns for each quarter from $t + 1$ to $t + 4$. We use equal-weighted COSPI index returns as a proxy for market returns. $MktM/B_{t-1}$ is the market-wide market-to-book ratio for the prior quarter i.e. $t-1$. $BHAR_{t+k}$ is the post-issue market adjusted buy-and-hold returns of the issuers for the each quarter from $t + 1$ to $t + 4$. Chi-square values are given in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

Regime I as compared to Regime II and underpricing is more in Regime I as compared to Regime II. Panel B shows strong evidence of aggregate market timing in Regime I but no evidence of aggregate market timing in Regime II as difference of pre-issue and post-issue market BHRs becomes negative in Regime II in most of the quarters. These results further support the univariate results of market timing of SEOs.

4.3. Impact of firm-specific market timing, aggregate market timing and market conditions on SEOs

In the current section, we directly examine the impact of firm-specific/aggregate market timing and market conditions on SEO activity by using regression models of Eq. (4). SEO activity is measured by number of SEOs in a given quarter. Apart from firm-specific and aggregate market timing discussed above, we use three different proxies; GDP, P/E ratio (BSE SENSEX), and T-bill rate to examine market conditions hypothesis. In a rapidly growing economy like India, we hypothesize that these variables to significantly increase over time. A growing economy has more growth opportunities and as a result of this demand for capital will increase. In this context, firms supply capital by issuing equity to meet the demand for capital in the economy. Hence, we expect SEO activity to have a positive association with market conditions variables.

Table 4 reports the results of Eq. (4) for SEOs in the whole time period. Model I and Model II show evidence of market timing and pseudo market timing respectively. However, if we include market timing variables along with market conditions variables in Model

Table 5
Impact of market timing and market conditions on SEO activity for Regime A and Regime B.

	Panel A 1991–1996 SEOs			Panel B 1997–2012 SEOs		
	Model I	Model II	Model III	Model I	Model II	Model III
Intercept	1.54 (3.47)*	-62.33 (12.71)***	-119.01 (1.66)	0.48 (2.96)***	-54.23 (320.76)***	-48.46 (37.79)***
LnGDP _(Q-1)		4.95 (14.32)***	8.92 (1.64)		4.32 (371.24)***	3.95 (50.34)***
P/E _(Q-1)		0.04 (7.54)***	0.18 (7.46)***		-0.02 (3.06)*	-0.13 (11.17)***
Tbill _(Q-1)		-3.21 (0.13)	33.91 (1.24)		-12.49 (26.13)***	-15.00 (3.73)**
UP _(Q-1)	0.21 (0.48)		0.08 (0.03)	0.02 (0.04)		0.09 (0.74)
BHAR _(Q+1)	-2.75 (2.05)		-3.29 (0.95)	2.81 (21.37)***		1.73 (7.5)***
BHAR _(Q+2)	-4.96 (16.7)***		-3.90 (6.71)***	4.90 (85.27)***		1.94 (10.22)***
BHAR _(Q+3)	13.78 (17.95)***		5.53 (1.86)	1.18 (5.26)**		1.00 (2.98)*
BHAR _(Q+4)	3.56 (15.9)***		2.13 (3.75)**	-0.35 (0.74)		-0.75 (2.39)
MBHR _(Q-1)	-0.23 (0.08)		-0.60 (0.37)	1.71 (38.13)***		0.50 (1.45)
MBHR _(Q-2)	1.19 (1.33)		1.53 (1.65)	0.02 (0.01)		0.54 (3.18)*
MBHR _(Q-3)	1.55 (4.91)***		1.42 (2.44)	0.71 (9.54)***		-0.05 (0.03)
MBHR _(Q-4)	-1.34 (1.61)		-0.87 (0.64)	-2.66 (110.18)***		-0.54 (1.56)
MBHR _(Q+1)	0.53 (0.46)		-0.18 (0.02)	-0.37 (1.51)		-0.87 (4.58)**
MBHR _(Q+2)	-2.41 (4.72)**		-0.14 (0.01)	1.08 (12.62)***		0.37 (1.34)
MBHR _(Q+3)	3.66 (8.28)***		-1.25 (0.14)	2.53 (57.45)***		0.87 (4.45)**
MBHR _(Q+4)	-7.90 (16)***		-0.25 (0.00)	0.15 (0.24)		-0.01 (0)
MktM/B _(Q-1)	-0.02 (0.01)		-0.98 (4.71)**	0.84 (112.65)***		0.52 (6.83)***
LL	89.65	71.74	96.41	1314.21	1389.50	1420.18
Full LL	-36.98	-54.89	-30.21	-202.91	-127.62	-96.94
N	20	20	20	39	39	39

This table reports the regression results of the following regression model for two regimes of SEOs:

$$MktSEO_{it} = \alpha + \sum_{k=1}^4 \beta_k BHR_{t-k} + \sum_{k=1}^4 \beta_{k+4} BHR_{t+k} + \beta_9 (MktM/B)_{t-1} + \beta_{10} UR_{t-1} + \sum_{k=1}^4 \beta_{k+10} BHAR_{t+k} + \beta_{15} \ln GDP_{t-1} + \beta_{16} \left(\frac{P}{E}\right)_{t-1} + \beta_{17} TBill_{t-1} + \beta_{18} MktM/B_{t-1} + \varepsilon_t$$

is the market-wide number of equity issues SEOs in each quarter in the given time period. BHR_{t-k} is pre-issue buy-and-hold market returns for each quarter starting from $t - 4$ to $t - 1$ and BHR_{t+k} is post-issue buy-and-hold market returns for each quarter from $t + 1$ to $t + 4$. We use equal-weighted COSPI index returns as a proxy for market returns. $MktM/B_{t-1}$ is the market-wide market-to-book ratio for the prior quarter i.e. $t - 1$. $BHAR_{t+k}$ is the post-issue market adjusted buy-and-hold returns of the issuers for the each quarter from $t + 1$ to $t + 4$. Panel A reports regression results of above equation for Regime I i.e. from 1991 to 1996 and Panel B reports regression results of Regime II of SEOs i.e. from 1997 to 2009. Chi-square values are given in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

III, we find strong evidence of market conditions hypothesis and weak evidence of market timing. Table 5 shows the regression results of Eq. (4) for two regulatory regimes: Regime I and Regime II. Panel A of Table 5 which presents results of Regime I shows that the regime experienced some evidence of market conditions but no evidence of market timing. On the other hand, we find weak evidence of both, market conditions and of market timing in Regime B. These results confirm our univariate results and dummy regression results discussed before.

4.4. Examination of long-run performance of SEOs using calendar-time approach

Long-run performance SEOs are our last set of results. Examining long-run performance of SEOs is considered as an indirect test of market timing and market conditions hypothesis. Firms' underperformance in the long-run post equity issuance is a sign of market timing. We examine long-run performance of SEOs for the total time period as well as the regulatory regimes. Additionally, we also analyze long-run performance of SEOs in hot and cold periods. We use Carhart (1997) four-factor model given in Eq. (5) to examine

Table 6
Calendar-time factor regressions of SEOs for whole time period and two regulatory regimes.

Panel A						
	Full Sample 1991–2012			1991–1996		
	CAPM	Fama-French	Carhart	CAPM	Fama-French	Carhart
Intercept	–0.04 (–2.8)***	–0.04 (–2.42)**	–0.04 (–2.33)**	–0.05 (–1.62)*	–0.06 (–1.95)**	–0.06 (–1.94)***
$R_m - R_f$	0.99 (45.86)***	0.99 (43.98)***	0.99 (43.25)***	0.96 (25.12)***	0.94 (24.79)***	0.95 (24.66)***
SMB		–0.02 (–0.5)	–0.01 (–0.27)		0.02 (0.42)	0.03 (0.60)
HML		0.00 (–0.06)	0.00 (0.12)		0.12 (2.28)**	0.12 (2.29)**
MOM			0.04 (0.64)			0.07 (0.47)
R^2	0.8995	0.8996	0.8998	0.8776	0.8847	0.885
F-Value	2103.09	695.99	520.76	630.78	219.99	163.55
N	237	237	237	90	90	90
Panel B						
	1997–2012					
	CAPM	Fama-French	Carhart			
Intercept	–0.06 (–3.56)***	–0.04 (–2.30)**	–0.03 (–1.59)			
$R_m - R_f$	0.95 (33.49)***	0.97 (35.27)***	0.99 (35.21)***			
SMB		–0.10 (–4.03)***	–0.09 (–3.67)***			
HML		–0.07 (–2.62)***	–0.06 (–2.21)**			
MOM			0.18 (2.88)***			
R^2	0.8684	0.8813	0.887			
F-Value	1121.74	415.92	327.58			
N	172	172	172			

This table reports the regression results of the following regression for SEOs:

Please Check

R_{pt} is the monthly portfolio returns calculated for the month t and R_{ft} is the one year risk-free rate. α is the market risk premium, where R_{mt} is the market return for the month t , which is COSPI index return in this case. β is the monthly return on the portfolio of small stocks minus monthly return on the portfolio of large stocks. γ is the monthly return on the portfolio of small stocks minus monthly return on the portfolio of large stocks. HML_t is the monthly return on the portfolio of high book-to-market minus the monthly return on the portfolio of low book-to-market returns. The fourth factor added by Carhart (1997), MOM_t is the momentum factor which is returns on the portfolio of high momentum stocks minus returns on the portfolio of low momentum stocks. Panel A reports regression results of SEOs for the whole period and regime I i.e. 1991–1996 and Panel B reports regression results of SEOs for regime II of SEOs i.e. 1997–2012. We examine the long-run performance for three years after equity issuance. N denotes the number of months for which the performance is examined. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

the long-run performance of SEOs for three years post equity issuance. The intercept in the regression model captures performance a firm. Hence, negative intercept indicates long-run underperformance.

Results of factor regressions for whole time period and regulatory regimes of SEOs are given in Table 6. We observe intercept to be negative and significant in all the cases except in one model for regime II. This suggests that the evidence of strong market timing in Regime I and evidence of moderate market timing in Regime II. Overall, we conclude that SEOs issue equity in order to time the market.

Table 7 report calendar-time factor regression results for hot and cold SEOs. We follow Helwege and Liang (2004) and define hot and cold SEO markets on the basis of monthly SEO underpricing. We compute the three month centered-moving average of underpricing of SEOs for each month. We define hot months as those months that are above the median of the distribution of monthly moving average of SEO underpricing and cold months as those that are below the median of the monthly moving average SEO underpricing across all the months. The intercept of all the models in case of hot SEOs is negative and significant as shown in Table 7 Panel A. This shows that the hot period SEOs underperform in the long run. In other words, these SEOs lose 4%, 3%, and 3% per month according to CAPM, Fama-French, and Carhart models respectively. The annualized loss of hot period SEOs is approximately 48%, 36%, and 36% respectively for the above three models. However, no such underperformance is observed for cold period SEOs as none of the intercepts is significant in any of the models in Panel A. This shows that SEO firms time the market mainly during hot issue periods.

Table 7
Calendar-time factor regressions of SEOs in hot and cold periods.

Panel A						
	Hot SEOs CAPM	Fama-French	Carhart	Cold SEOs CAPM	Fama-French	Carhart
Intercept	-0.04 (-2.93)***	-0.03 (-1.89)*	-0.03 (-1.79)*	-0.02 (-0.59)	-0.01 (-0.45)	-0.01 (-0.42)
$R_m - R_f$	0.99 (48.27)***	1.00 (47.37)***	1.00 (46.65)***	1.02 (24.8)***	1.02 (23.89)***	1.02 -23.30
SMB		-0.07 (-2.36)**	-0.07 (-1.98)**		-0.02 (-0.28)	-0.01 (-0.2)
HML		-0.01 (-0.34)	0.00 (-0.1)		0.02 (0.36)	0.02 (0.4)
MOM			0.06 (0.85)			0.03 (0.2) [†]
R^2	0.9084	0.9108	0.911	0.7313	0.7317	0.7318
F-Statistic	2329.98	792.72	594.02	615.01	203.65	152.1
N	237	237	237	228	228	228
Panel B						
Difference between Hot SEOs and Cold SEOs						
	CAPM	Fama-French	Carhart			
Intercept	-0.02 (-0.71)	-0.01 (-0.51)	-0.01 (-0.4)			
$R_m - R_f$	-0.02 (-0.49)	-0.01 (-0.36)	-0.01 (-0.2)			
SMB		-0.02 (-0.49)	-0.02 (-0.35)			
HML		-0.02 (-0.35)	-0.01 (-0.22)			
MOM			0.07			
R^2	0.001	0.0023	0.0038			
F-Statistic	0.24	0.17	0.22			
N	231	231	231			

This table reports the regression results of the following regression for SEOs in hot and cold period:

Please Check

R_{it} is the monthly portfolio returns calculated for the month t and R_{ft} is the one year risk-free rate. λ is the market risk premium, where R_{mt} is the market return for the month t , which is COSPI index return in this case. SMB_t is the monthly return on the portfolio of small stocks minus monthly return on the portfolio of large stocks. HML_t is the monthly return on the portfolio of high book-to-market minus the monthly return on the portfolio of low book-to-market returns. The fourth factor added by Carhart (1997), MOM_t is the momentum factor which is returns on the portfolio of high momentum stocks minus returns on the portfolio of low momentum stocks. Momentum is computed on the basis of previous one year returns. Panel A reports regression results of SEOs belonging hot period and cold period. Panel B reports regression results of the difference between the performance of hot and cold SEOs. SEOs are classified as hot and cold on the basis of underpricing. ***, ** and * indicate significance at 1%, 5% and 10% respectively.

5. Conclusion

In spite of extensive research for many years, there is no conclusive evidence on whether IPO/SEO waves are driven by market timing or market conditions. In this paper, we examine market timing hypothesis versus market conditions hypothesis for SEO firms in the context of an emerging economy, India. We test market timing hypothesis against market conditions hypothesis for all SEOs during 1991–2012 in two ways. One, we directly analyze the impact of firm-specific as well as aggregate market timing and market conditions hypothesis on SEO activity. Two, we employ indirect test of market timing through long-run performance of SEOs post issuance. Underperformance of SEO firms in the long run is also an evidence of market timing. We examine SEOs at aggregate level and in two different regulatory regimes; Regime I (post-liberalized era from 1991 to 1996) and Regime II (initial and reformed regulated era from 1997 to 2012).

We find strong evidence of market conditions hypothesis and moderate to weak evidence of firm-specific and aggregate market timing respectively for the complete time period. In regime I (1991–1996), we do not find any evidence of market timing but we find weak evidence of market conditions whereas in regime II (1997–2012), we find weak evidence of market timing and market conditions hypothesis. Also, market timing by SEOs is strong during hot issue period compared to the cold issue period. We find long-run underperformance for our sample firms for the time period of our study. These results of long-run performance of SEOs for complete time period and in different regimes support the results of the direct tests.

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