STOCK MARKET CRISIS AND IPOS UNDERPRICING: EXPERIENCE FROM INDIAN STOCK MARKET

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ABSTRACT

Initial public offer (IPOs) is a prominent milestone in the life cycle of a firm and has a significant effect on the firm’s performance. Worldwide, underpricing is one of the most observed anomalies in the new issue market. In this paper, we describe the impact of Indian stock market crisis on initial performance of IPO underpricing and to examine the changes occurs, due to the market crisis. We composed variables the likes of firm’s age, issue size (total amount to be raised), market capitalization, subscription rate, number of shares offered to investor’s and pricing mechanism (dummy variable). This paper attempts to explore the relationship between the dependent variables underpricing of an issue and firm’s age, issue size (total amount to be raised), market capitalization, subscription rate and number of shares offered to investor’s and pricing mechanism. We determine 51.4% R square & 43.3% adjusted R square. However, Durbin-Watson has given 1.793 values, which indicate there is no serial autocorrelation & heteroscedasticity problem exist in the regression model. We encounter that market capitalization; number of shares offered to investor’s and issue size is significant affecting level of underpricing. Issue size & number of shares offered is found to be negative affecting underpricing. Market capitalization is found to be positive relationship with underpricing. However, firm’s age, subscription rate and pricing mechanism is not significant relative with underpricing.

KEY WORDS: Ipo, Underpricing, Ipos Determinants, Post Ipo Crisis, Ipos Variables, Book Build, Time Series Analysis, Indian Primary Market, Fixed Price Options.

OVERVIEW

The decision to go public, or make an initial public offering (IPO) of equity, is an important landmark in a firm’s life cycle. Investment banks act as partners of firms during the IPO process. They advise firm how to structure the offering, how to market it to investors, organize the related road shows, and conceivably most crucially, help set the offer price for the issue. In what way the issue manager arrives at the IPO price depends on the offering mechanism.

The empirical evidence on the performance of private and government firms is also inconclusive. (Megginson W. &., 1991)10, suggested that privatized firms perform better than their
counterparts. On the other hands, (Kay, 1986) provided evidence which is supportive of government enterprise. The accuracy of pricing of an IPO affects the value of the firm, as well as the initial returns available to its subscribers. (Loughran. Et.al.1994). (Allen, 1989), shown underpricing as a signaling device used by high-quality firms which intend to make subsequent equity issues to distinguish themselves from the other firms. (Baron, 1982) & (Rock, 1986), proposed non signaling explanations for underpricing. In baron’s model, advisers are better informed about the equilibrium price of an issue than the issuing company and investors. Advisers provide underwriting, marketing, and price. Baron examines that they have an incentive to underprice so as to reduce the selling effort and the chance that they will left with unsold shares.

In India, the fixed price mechanism was used to price IPOs until 1999 during. this period IPOs were underpriced substantially. The majority of the researchers are continuously investigating various facets of the pricing mechanism to find suitable explanations for the underpricing. (Rock, 198612), winner curse model, information revelation theory by (Benveniste, 1989), price stabilization theory by Rudd (1993), tried to give reasons for the Undepricing phenomenon. (Rock, 1986), developed the ‘winners curse’ model based on the information asymmetry between informed and uninformed investors. To attract uninformed investors, companies underpriced new issues so that after market price exceeds the offer price.

Investors are categorized as small (or retail) and non-retail (including institutional investors). Retail investors have a cap on the value of their bids, currently at INR 100,000 (about $2000). Unlike retail investors who can submit either market or limit orders, non-retail bidders must place to only limit bids. Valid bids are those that are at or above the final offer price and are eligible for allocation up to the amount sought by the bidder. A prominent aspect of the IPO process is that all bids are legally binding so bidders with valid bids are legally obliged to take up any allocations awarded by underwriters. In contrast, bids are only indicative expressions of interest in the US or the European markets. The quantity of shares available for allocation for retail investors and institutions is known before the offer. Fifty percent of the shares are reserved for institutional bidders. Adjustments in the middle categories can only be done if a category is undersubscribed. At hand are no such IPOs in our sample.

**Pricing Mechanisms**

There are two techniques to issue shares in an initial public offering; book building and fixed price option. In India and other countries, the book building technique is the frequently used method to price shares.

**Book-Building**

Book Building indictments a Price at which securities will be offered/ allotted is not known in advance to the investor. Only an indicative price range is known. Book building ordinarily leads to more aggressive pricing than traditional fixed price method. Under book building, since all applicants above the cut-off points are allotted shares, ideally, there should not be any pressure of unsatisfied demand in
the market, leading to a lesser possibility of market prices rising above the issue price after listing. Consequently, IPOs based on book building method may deliver fair pricing.

**Fixed Price Option**

Price at which the securities are offered allotted is recognized in advance to the investor. Demand for the securities offered is known only after the closure of the issue. While Payment if made at the time of subscription wherein refund is given after allocation.

**IPO UNDERPRICING**

Underpricing of IPOs has been considered as a prevalent phenomenon across the world. When companies go public, the equity they sell in as initial public offering tends to be underpriced, resulting in a substantial price jump on the first-day corporations trading. Underpricing is generating additional value in the stock when it first becomes traded. This leads to significant gains for investors who have been allocated shares at offer price. However, underpricing an IPO results in “money left on the table”- lost capital that could have been raised for the company had the stock been offered at a higher price.

**Why Ipo Underpricing**

An initial public offering (IPO) issue process requires the active involvement of three key players: the firm, a single investment bank or group of investment banks (for underwriting & marketing the IPO), and the investors (institutional & non-institutional) intending to buy shares. The issuing firm wants to obtain the maximum price per share (issue price) while the investors want to buy the shares at a minimum price. Investment banks acting as intermediaries help in matching the opposite expectation of both the parties. Investment banks also perform various other functions like certifying the economic rationale of the issue to regulatory bodies like the Securities & Exchange Board of India (SEBI), deciding the issue price, allocating shares to investors and other issue specific responsibilities.

Empirical studies have found evidence that the underpricing for IPOs of financial institutions is related to proxies for asymmetric information. Offer size (Megginson, 1991), age of the firm (Muscarella, 1989), (Megginson, 1991), Logue, 1973; (McDonald, 1972), Recently (Islam, 2010), conducted empirical tests on the relationship between Subscription rate, issue size, industry type and underpricing using 196 initial public offerings on the Dhaka Stock exchange.

**Money left on table by Indian companies from 2007-2011**
Table 1, Money Left on Table by Indian Companies From 2007-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>No of ipos</th>
<th>Underpriced</th>
<th>Issue size (cr)</th>
<th>Left money (cr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>105</td>
<td>65</td>
<td>28396.82</td>
<td>11310.27</td>
</tr>
<tr>
<td>2008</td>
<td>38</td>
<td>18</td>
<td>4426.85</td>
<td>767.48</td>
</tr>
<tr>
<td>2009</td>
<td>21</td>
<td>14</td>
<td>16641.34</td>
<td>794.68</td>
</tr>
<tr>
<td>2010</td>
<td>73</td>
<td>49</td>
<td>58992.72</td>
<td>12229.5</td>
</tr>
<tr>
<td>2011</td>
<td>39</td>
<td>19</td>
<td>10407.92</td>
<td>1066.17</td>
</tr>
<tr>
<td>Total</td>
<td>276</td>
<td>165</td>
<td>118865.7</td>
<td>26168.1</td>
</tr>
</tbody>
</table>

$1= 50 INR   bn $ 24 5

PREVIOUS RESEARCH

(Rock, 1986) disclosed investors who are more informed (than the firm as well as other investors) about high underpricing offers crowd out uninformed investors. On the other hand, these more informed investors withdraw in issues, which are over priced leaving the uninformed investors with the winner’s curse problem. Thus, the uninformed investors would not participate in over priced issues. Hence in order to attract such investors, the firm would be under price its IPO.

(Loughran, 2002), construct that during 1990-1998 firms, which moved public total earnings of $8 billion while they left $27 billion on the table even though they paid $13 billion as fees to him under writers. It made Loughran and Ritter propound a prospect theory for under pricing where they state that issuers of IPOs leave a lot of money on the table because they see a prospect of higher trading price in the first few days of listing, consequently, offsetting their loss of wealth in under pricing the IPOs and in fact, resulting in net gains their wealth levels. More importantly they construct that most IPOs leave little money on the table.

(Dolvin, 2008), communicated the question of whether or not periods of high underpricing adversely affect pre-existing shareholders. They create that high levels of underpricing are associated with increased share retention, which effectively offsets much of the potential cost. Overall, the percentage of shareholder wealth lost is stable over time, unlike underpricing itself. Furthermore, many factors known to be related to underpricing are not significant determinants of the cost of going public to pre-existing owners.

(Islam, 20109), evaluates the levels of underpricing in initial public offerings (IPOs) and its determinants of Dhaka Stock Exchange (DSE). Key trends in the levels of underpricing and overpricing are highlighted out on a year to year, and industry as the industry basis. Regression Analysis indicates that offer size and size of the company are positively related to the degree of underpricing. However, age of the firm and timing of the offer existed to have no significant influence on the degree of underpricing of IPO in the Dhaka Stock Exchange.
disclosed the efficiency of IPO issuing mechanisms using a sample of Indian IPOs that tapped the primary market during 2003-07 by taking into consideration the total costs the issuers have to face i.e., including both direct as well as indirect costs. He determines that from a total cost point of view the issuers fare neither better nor worse using either book building or the fixed price offers. Their results also reflected that the issue expenses associated with book building is more than those associated with fixed price offers after controlling for issue size and firm specific characteristics.

\textbf{(Bansal, 2012)}, take apart regarding significant difference in the magnitude of level of underpricing of ipos priced through the book build with those are priced by the fixed price option. They create the magnitude of underpricing is distressed the book-build and fixed price option imparted varied results. They establish significant difference in level of magnitude of underpricing in IPOs that priced through the book build with those that are priced through the fixed price option.

**RESEARCH OBJECTIVES**

1) To measures, the IPOs initial performance on initial trading day to verify that investors can gain positive return or not on the close of the initial trading day.

2) To analysis, the relationship between different factors such as subscription, issue size, firm’s age, number of offered shares, market capitalization and pricing mechanism and level of dependent variable i.e. underpricing.

**Research Method**

The data for the study was obtained from the website of the Bombay stock Exchange (BSE) \url{http://www.bse-india.com/} under the heading of book building in IPOS. We also supplemented these data from CMIE & Capital line database. The period for which the data was taken for the study was Oct 2007 to 31st dec 2011. The data is analyzed using multiple linear regressions. All the firm-specific variables are regressed against the underpricing to find out which variables are momentous in determining the underpricing. Multiple linear regression is done to see if there is a statistically significant difference in the underpricing between book build issues & fixed price issues by pricing mechanisms.

**HYPOTHESES TESTING**

**Measure of Underpricing**

Consistent with the standard methodology, underpricing is calculated as the percentage change from the offer price to the closing price in the secondary market.

\[
\text{Traditional underpricing} = \frac{(\text{closing price} - \text{offer price})}{\text{offer price}} \times 100.
\]

\[
\text{Log underpricing} = \ln \left( \frac{P_1-P_0}{P_0} \right) \times 100
\]

**Measure of Subscription Rate**

The subscription measured as the quantity of shares of the total times had investors subscribe after the issue. The natural logarithm of this value is used as it is a standard practice and to remove heteroscedasticity.
There is no statistical significant relationship between Subscription rate and level of underpricing.

Measure of Issue Size

The issue size is measured as the total number of shares offered multiplied by the offer price. Again, the natural logarithm of this value is used as a standard practice and to remove heteroscedasticity.

There is no significant relationship between issue size and level of underpricing.

Measure of Market Capitalization

The market capitalization is measured as the total number of shares multiplied by the market price per share. Again, the natural logarithm of this value is used as a standard practice and to remove heteroscedasticity.

There is no significant relationship between market capitalizations and less underpricing.

Measure of Number of Shares Offered

The total numbers of share that a company offered to their issuers in the market. Again, the natural logarithm of this value is used as a standard practice and to remove heteroscedasticity.

There is no significant relationship between number of offered shares and underpricing.

Measure of Firm’s Age

Firm age is measured in years as the difference between the year of IPO and the year of incorporation of the firm.

There is no significant relationship between firm’s age and degree of underpricing.

Pricing Mechanism

For the pricing mechanism again a dummy variable is used to indicate the presence of book build in ipo underpricing. The presence is shown with value equal to 1 and 0 otherwise.

There is no significant relationship between pricing mechanism and underpricing.

The Multiple Regressions Model

The impact of the independent variables namely, Subscription rate, issue size, market capitalization, firm’s age, number of share offered on the dependent variable underpricing is modeled through multiple regression as:

\[
\text{LOGUNDER} = C(1) + C(2)*\text{LOGAGE} + C(3)*\text{LOGISSUESIZE} + C(4)*\text{LOGMKTCAP} + C(5)*\text{LOGSUBSC} + C(6)*\text{LGNOOFSHARE} + C(7) \text{PRICING MECHANISM} + e
\]

The data for the study was obtained from the website of the Bombay stock Exchange (BSE) http://www.bse-india.com/ under the heading of book building in IPOS. We also supplemented these data from CMIE & Capital line database. The period for which the data was taken for the study was Oct 2007 to 31st dec 2011.

Ipos on Bombay Stock Exchange from 2007-2011
Table 2, IPOs on Bombay stock Exchange from 2007-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Bse issue</th>
<th>BB</th>
<th>FPO</th>
<th>BB- Under</th>
<th>BB- Over</th>
<th>Fpo- Under</th>
<th>Fpo- over</th>
<th>% bbu</th>
<th>%BBO</th>
<th>%fpo</th>
<th>%fpo o</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>106</td>
<td>105</td>
<td>91</td>
<td>14</td>
<td>59</td>
<td>32</td>
<td>7</td>
<td>7</td>
<td>51.5</td>
<td>-21.42</td>
<td>113.67</td>
<td>-3.3</td>
</tr>
<tr>
<td>2008</td>
<td>38</td>
<td>38</td>
<td>33</td>
<td>5</td>
<td>16</td>
<td>17</td>
<td>2</td>
<td>3</td>
<td>36.4</td>
<td>-26.36</td>
<td>18.06</td>
<td>-32.3</td>
</tr>
<tr>
<td>2009</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>0</td>
<td>14</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>19.0</td>
<td>-14.52</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2010</td>
<td>73</td>
<td>73</td>
<td>71</td>
<td>2</td>
<td>47</td>
<td>24</td>
<td>2</td>
<td>0</td>
<td>22.3</td>
<td>-12.85</td>
<td>60.77</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>40</td>
<td>39</td>
<td>38</td>
<td>1</td>
<td>19</td>
<td>19</td>
<td>0</td>
<td>1</td>
<td>47.3</td>
<td>-33.32</td>
<td>0</td>
<td>-60.4</td>
</tr>
<tr>
<td>Total</td>
<td>278</td>
<td>276</td>
<td>25</td>
<td>4</td>
<td>22</td>
<td>155</td>
<td>11</td>
<td>11</td>
<td>44.2</td>
<td>-21.7</td>
<td>38.5</td>
<td>-19.2</td>
</tr>
</tbody>
</table>

DESCRIPTIVE STATISTICS

The descriptive statistics of the various variables in the model are as follows-

Table 3, Descriptive statistics of the various variables
Test for Normality

![Histogram showing normal distribution](image)

**Figure 1**, Normality results by Jarque Bera test

Checking the Data for Stationarity of the Time Series

![Graph showing time series data](image)

**Figure 2**, Degree of underpricing – firms to the extreme left in the X axis were listed in Oct 2008 and those to the extreme right in Dec-2011. Y axis shows the degree of underpricing in percentage terms.
Augmented Dickey-Fuller Test Statistic

Table 4, Unit root test by ADF

| Null Hypothesis: LOGUNDER has a unit root |  |
| Exogenous: Constant |  |
| Lag Length: 0 (Automatic - based on SIC, maxlag=11) |  |
|  | t-Statistic | Prob.* |
| Augmented Dickey-Fuller test statistic | 8.595451 | .0000 |
| Test critical values: | 1% level | -3.51229 |
|  | 5% level | 2.897223 |
|  | 10% level | 2.585861 |


The computed ADF test-statistic (-8.59) is smaller than the critical values - "tau" (-2.585, -2.897, -3.512 at 10%, 5%, 1% significant level, respectively). Therefore, we be capable to reject Ho. It means the underpricing I series doesn't have a unit root problem, and the underpricing series is a stationary series at 1%, 10% and 5% significant level.

Estimation the Multiple Regression Equation

1. Dependent Variable: LOGUNDER
2. Method: Least Squares
3. Included observations: 83

Table 5, Multiple Linear Regressions Results, *Sig @ 5% Significance Level

** Sig @ 10% significance level

Coefficients:

| LOGUNDER = -89.45882-0.058601*LOGAGE -1.039017* LOGISSUESIZE + 0.778549* LOGMKTCAP -0.118611*LOGSUBSC -0.300833* LGNOOFSHARE+ 0.878093 PRICING MECHN |

THE RESULTS OF HYPOTHESES TESTING

Results of Testing H1

Established on the multiple linear regression result it was build that issue size, market capitalization and number of share offered comprises significant relationship with the level of underpricing at the Bombay stock exchange. Firm’s age, subscription rate & pricing mechanism contains no significant relationship with the level of underpricing. Over there is no significant relationship
between subscription rate and level of underpricing at 5% significance level \((z= -1.11)\). Therefore, null hypothesis 1 is accepted.

**Results of Testing H2**

There is a significant relationship between issue size and level of underpricing at 5% significance level \((\text{sig } z= -2.55)\) compare to \(z\) table value at 5% (-1.96). This indicates that issue size has negative impact on underpricing. Therefore, **null hypothesis 2 is rejected**.

**Results of Testing H3**

There is important relationship between market capitalization and level of underpricing at 5% significance level \((\text{sig } z= 2.46)\). The market capitalization has a positive relevant effect on the level of underpricing. It indicates that more market capitalization effect more underpricing. Therefore, **null hypothesis 3 is rejected**.

**Results of Testing H4**

There is no significant relationship between firm’s age and level of underpricing at 5% significance level \((z= )\). Therefore, hypothesis 4 is accepted.

**Results of Testing H5**

There is significant relationship between numbers of share and level of underpricing at 5% significance level \((z= -2.23)\). The number of shares has got unco-operative significant relationship with underpricing. Hence null hypothesis 5 is rejected.

**Results of Testing H6**

There is no significant relationship between pricing mechanism and level of underpricing at 5% significance level \((z= 1.16)\). Therefore null hypothesis 6 is accepted. The pricing mechanism holds no significant effect on level a level underpricing.

**DISCUSSIONS**

Our study reveals corresponding results regarding **issue size**. Issue size is having negative relationship with the level of underpricing. The result indicating the unco-operative relationship of issue size in the immediate study is in confirmation of the result found by (Deb, 2010). Market **capitalization** is having positive relationship with underpricing in the current study. A finding of the present study is not agreement with findings by (Richard, 2006). Subscription rate & firm’s age are having no significant relationship with the level of underpricing in the present study. A finding of the immediate study is not agreement with findings of (Rock, 1986) Disclosed negative relationship with the level of underpricing in the instant study. A finding of the present study is not agreement with findings of (Leite, 2000). **Pricing mechanism** is having relationship with level of underpricing. A finding of the present study level is the confirmation with result found by (Bansal, 2012).
CONCLUSIONS

This paper examines the analysis of underpricing in the Indian stock market and determines the factors are important in affecting the underpricing. Among the variables, issue size, market capitalization and number of share offered were found to be relevant in affecting the underpricing. There is negative relationship between issue sizes & number of offered share with the level of underpricing on one side. Other side there is positive relation with market capitalization and level of underpricing. There is no significant association between subscription, firm’s age and pricing mechanism at the level of underpricing. On the base of results, we express that Indian stock market crisis has affected a level of underpricing and their related variables.

REFERENCES