This paper surveys some effective factors on long-term and short-term returns of initial public offerings (IPO) of private companies in Tehran Stock Exchange (TSE) market. We use panel data approach to compare determinant factors of returns of IPO in private firms. The results show that P/E ratio, volume of transactions and size of companies are the main factors of determinant of abnormal long-run returns of IPO in private companies. In the short-run, the IPO’s returns of private enterprises related to size, and volume of transaction. Results of research pointed to conclusion that the corporate ownership has no significant impact on returns of IPO in short-run and long-run. And private enterprises might retain the profit and release the loss by set share retention/offering rate and over/under pricing of IPO companies.

Index Terms— Initial public offerings, abnormal returns, corporate ownership, Tehran Stock Exchange

1. INTRODUCTION

Various aspects of initial public offerings (IPO) and post-IPO performance have so far empirically examined: long-run versus short-run performance of the IPO, sample of IPO and timing, model specification, management quality, prospectus, regulatory, pricing and underpricing and etc. (Abhyankar, Chenb, & Ho, 2006) and (Bessler & Thies, 2007) study the long-run performance of IPOs. (Ritter & Welch, 2002) Argue that the characteristics of an IPO sample contribute to the observed differences in the findings of studies on the long-run performance. (Gompers & Lerner, 2003) Argument that the relative performance of an IPO sample depends on the method used to examine performance.

(Moshirian, Ng, & Wu, 2010) Examine model specification and IPO performance and show that the existence of long-run under performance for Asian IPOs depends on the methodology used. (Kirkulak, 2008) Provide insight into Japanese venture capital (VC) industry and find that the long-run stock performance results are very sensitive to the methods used to measure average abnormal returns.

(Goergen & Renneboog, 2007) Study ownership matter and conclude that the long-run performance of IPOs is not correlated with control and ownership retention. Although (Roosenboom & Goot, 2005) analyze that ownership and control variables influence market value at the time of the initial public offering. (Marisetty & Subrahmaniam, 2010) Document groups affiliation (domestic, foreign, or government) and the performance of IPOs. (Wu & Kwok, 2007) Investigate long-run performance of global IPOs as compared to purely domestic ones made by US industrial companies.

(Chorruck & Worthington, 2010) Study pricing and performance of IPOs and (Vong & Trigueiros, 2010) examine the short-run price performance of IPO. (Chana, Wangb, & John Weia, 2004) Appraise underpricing and long-term performance of IPOs. (Chia & Padgett, 2005) Survey short-run underpricing and its characteristics in Chinese IPO markets. (Li, Zheng, & Melancon, 2005) Examine effects of underpricing and share retention on IPO aftermarket liquidity. (Cheung, Ouyang, & Tan, 2009) Study regulatory changes affect IPO underpricing. There are various explanations for underpricing, with theories based on asymmetric information, agency costs, and signaling. (Ritter & Welch, 2002) Point out there is no single dominant theoretical cause for underpricing. They show that IPO underpricing is significantly related to: P/E ratio differential, capital rose, offer price, and the 30-day cumulative pre-market return before listing. (Kenourgios, Papathanasiou, & Rafail Melas, 2007) Find that underwriter’s reputation and over subscription are two main determinants of short-run underpricing of Greek IPOs. Research of (Agatheea, Sannasseea, & Brooks, 2012) shows that ex ante financial strength (based on the Altman Z-score) has a significant negative effect on short-run underpricing.

This study mainly focuses on the main determinant factors of returns and seek to answer whether the long-run
and short-run returns of both public and private IPO companies influenced by size, age and unobservable individual firm’s specification, volume of transactions, P/E ratio and offering rate. If it is influenced, is effect of these factors on long-run and short-run returns the same in two groups of IPO private enterprises?

2 DATA AND ANALYTICAL METHODS

2.1 Data:

The data which are used in this paper are: company’s size, age, transaction volume, accumulated returns, P/E ratio and initial offering rate. All row data are accessible from the web site of Tehran Stock Exchange. The sample of pool data has been since 1th February 2006 to 30th February 2011 for 15 private enterprises. An amount of 30 daily cumulative returns of observations collected for comparison the short-run returns of IPO of private companies since initial public offering date. The name, website addresses and initial public offering date of 15 companies listed in the appendix. As (Fama, 1998) and (Mitchell & Stafford, 2000) argue, cumulative abnormal return (CAR) may be a better, less biased method to gauge long-run returns. Hence we calculate CAR as follows:

\[ CAR_{i,t} = \sum_{t=1}^{T} (R_{it} - R_{mt}) \]

where \( R_{it} \) and \( R_{mt} \) are daily returns for firm i and daily market returns respectively.

Here we use cumulative daily returns because there is some regulated limitation on the volatility of a share price in Iran and it is maximum 4 percent daily. If we use ended closed price of a stock in this situation it does not show the appropriate change of a stock price. However, cumulative returns never ignore high variation of price among a period. Either way 12 monthly accumulated returns of observations collected for comparison with the long-run returns.

2.2 Analytical Method:

In order to determine the effective factors on long-term and short-term returns we use a panel data approach and estimate the parameters of a panel data model by quantitative econometric software EViews 7. Our basic, empirical evidence, model is a linear equation:

\[ R(IPO_{it}) = \alpha + \gamma_r L(\text{Size})_{i,t} + \gamma_r (\text{Age})_{i,t} + \gamma_r (\text{OffRate})_{i,t} + \gamma_r L(\text{Trans Vo})_{i,t} + \gamma_r P/E_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \]

Where, \( R(IPO_{it}) \) the dependent variable, is the long-term return adjusted by market returns, (abnormal return), correspond to period t and company i. \( L(\text{Size}) \) is the logarithm total market value of a firm i.e. number of total shares multiplied by daily price of shares. Age is the age of the company from the date of establishment to the date of the initial offering in the TSE market by year. Off. Rate is the ratio between number of exchange shares on the first day and total numbers of company’s shares during offering date in TSE market. Log (Trans Vo) Represent logarithm transaction volume. \( P/E \) is the stock price divide by its per earnings. \( \mu_i \), \( \lambda_t \) represent the between-cross section and between-time period variances, respectively. \( \varepsilon_{i,t} \): Idiosyncratic effect or within-group variance. \( \alpha \): Intercept; N: number of firms, T: number of time periods.

2.3 Panel Data Analysis:

Panel data allow control for variables that cannot observe or measured like manager behavior factors and differences in business practices across companies or variables that change over time but not across entities. Here we focus on two techniques used to analyze panel data: Fixed Effects (FE) and Random Effects (RF). The features...
of FE models are that they cannot be used to investigate time-invariant causes of the dependent variables. Technically, time-invariant characteristics of the individuals are perfectly collinear with the entity dummies. Substantively, FE models are designed to study the causes of changes within an entity.

When using FE we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Because each entity is different therefore the entity’s error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated then FE is no suitable since inferences may not be correct and we need to model that relationship (probably using RE). This is the main rationale for the Hausman test (Hausman, 1978).

The rationale behind RE model is that, unlike the FE model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model (Greene, 2003).

3 Estimation results and discussion

3.1 Descriptive statistics

As shown in Fig. 1 most of private companies, about 73% of private companies respectively, have a negative capital gain in the long-term. In addition most of private enterprises have a positive capital gain in short-term.

![Figure 1: compare short-term and long-term capital gain of initial offering shares in private enterprises](image)

3.2. Estimation of model

The estimation results of the model in short-run and long-run illustrated in tables 2, 3 respectively. This study estimates returns of IPO and its explanatory variables as Eq. 1 on unbalanced panel data either in public and private firms in short-run and long-run. The sample of pool data has been since February 2006 to February 2011. An amount of 30 daily observations of cumulative returns collected for comparison the short-run returns of IPO of public and private companies since initial public offering date. Either way 12 monthly observations of cumulative returns collected for comparison the long-run returns. The basic panel model in Eq. 1, referring to both intercept and slopes. In the event that there is neither a significant firm specific nor significant temporal effects, we could pool all of the data and run an ordinary least squares (OLS) regression model. Therefore one can argue that there are significant differences among firms and unobserved firm specific characteristics, such as business practices across companies, investment opportunities or variables that change over time but not across entities which might affect the returns of IPO and are not captured by the pooled OLS model. These firm specific effects may be correlated to the regressors and thus one needs to control those unobserved time-invariant firm specific effects by allowing the error term to include a firm-specific fixed effects.
Thus it yields consistent estimators in the presence of company fixed effects provided that the regressors are not correlated with the error term. Furthermore to postulate the hypothesis, we oblige to use fixed effect or random effect techniques.

Column (1) of both tables 2, 3 contain explanatory variables of the model: Log (Size), P/E, Offering Rate, Log (Age) and Log (Transaction volume). Column (2) and column (3) of tables 2, 3 shows estimated parameters of the suitable model for the public companies and private enterprises respectively. The suitable model selected according to Hausman's specification test, adjusted R-squared and Durbin-Watson statistic. Hausman's specification tests whether there is significant correlation between the unobserved firm-specific RE and the regressors. If there is such a correlation, the RE model would be inconsistent estimated and the FE model would be the model of choice. Other statistics of estimation also present in both preferred FE model and RE model.

Table 1. Estimation returns adjusted by market returns

<table>
<thead>
<tr>
<th>Variables:</th>
<th>Long-term</th>
<th>Short-term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-1.6988</td>
<td>-19.8261</td>
</tr>
<tr>
<td></td>
<td>(0.1251)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Log(Size)</td>
<td>▲</td>
<td>0.8959</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0000)</td>
</tr>
<tr>
<td>P/E</td>
<td>0.0155</td>
<td>0.0007</td>
</tr>
<tr>
<td></td>
<td>(0.0226)</td>
<td>(0.7266)</td>
</tr>
<tr>
<td>Offering Rate</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Log(Age)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Log(Transaction volume)</td>
<td>-0.01335</td>
<td>-0.0003</td>
</tr>
<tr>
<td></td>
<td>(0.0014)</td>
<td>(0.0901)</td>
</tr>
<tr>
<td>AR(1)**</td>
<td>-</td>
<td>0.9308</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0000)</td>
</tr>
<tr>
<td>R-squared ($R^2$)</td>
<td>0.4708</td>
<td>0.9974</td>
</tr>
<tr>
<td>Adjusted R-squared (Adj.$R^2$)</td>
<td>0.3475</td>
<td>0.9973</td>
</tr>
<tr>
<td>Durbin-Watson stat.</td>
<td>1.6858</td>
<td>1.8267</td>
</tr>
<tr>
<td>F-statistic</td>
<td>3.8180</td>
<td>9082.9</td>
</tr>
<tr>
<td></td>
<td>(0.0000)</td>
<td>(0.0000)</td>
</tr>
<tr>
<td>Total panel (unbalanced) observations:</td>
<td>165</td>
<td>435</td>
</tr>
<tr>
<td>Cross-sections included:</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Redundant Fixed Effects Tests: Cross-section Chi-square</td>
<td>2.2316</td>
<td>97.9334</td>
</tr>
<tr>
<td></td>
<td>(0.0095)</td>
<td>(0.0000)</td>
</tr>
</tbody>
</table>

Note: • P-Value, ••AR (1) indicates first order autoregressive component of specification, •••Probe (F-statistic).

3.3. Empirical results

The estimated coefficient of Log (size) and P/E, as shown in table 2, the coefficients Log (transaction volume) is significant and the coefficient P/E is not significant in the estimated model of private enterprises in short-run. Significant of AR (1) in preferred short-term model indicates that there is autoregressive component in the specification of model, and it implies that short-run returns of todays is correlated to previous day.

Thereby present estimation results in short-run returns; we conclude that the IPO’s returns of private enterprises related to size, and volume of transaction.
As shown in table 2, the coefficient of P/E and log (transaction volume) is significant in estimated long-run models for both private. It is considerable that coefficient size has a variety specification across companies in preferred private enterprises long-run model. The size of a company points up the scale of firm’s operation. Therefore due to scale of firm operation, long-run returns of a firm influenced with his own size. In summary, the fundamental factors, such as P/E ratio and size of firms are the main determinant of long-run abnormal returns of IPO in both private enterprises.

4 Conclusion

The article provides empirical determinate of affective factors on long-term and short-term returns of IPOs of private companies in the Tehran Stock Exchange market. We use panel data approach to compare determinant factors of returns of IPO either in private firms in short-run and long-run.

Result of descriptive statistic shows that most of private enterprises are overpriced and have negative abnormal returns in long-run. Considering the privatization condition in economies of Iran and neglect the effect of firms’ operation performance trusts conclusion of overpricing in IPOs process. Furthermore some companies set high/low offering rate to retention the potential loss/profit.

Estimation results indicate that some fundamental and technical factors such as P/E ratio, size of the firm and volume of transactions are the main factors of determinant of abnormal long-run returns of IPO in private companies as we expected. In the short-run, technical factors such as volume of transaction and individual firm’s specification factors are the determinants of short-run the IPO’s returns.

Therefore, short-run IPO’s returns of private enterprises related to the size and volume of transaction and there is no statistical evidence in significance of the individual firm’s specification.

Limitation of sample estimation constrained us to include other variables such as industry structures in the estimated model. Perhaps specific characteristics of industry affect the firms’ performance in IPOs process.

Overall, there are many factors that determine the long-run and short-run returns of IPOs companies. Thus government and corporate policy makers might use some of these factors as tools to do their arbitrary propose by regulatory, pricing, smoothing and timing in initial public offerings.

References
