



## **A Study of the Anomalies of Initial Public Offerings on the Tehran Stock Exchange**

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**Abstract:** Developed stock exchanges offer between 300 to 400 Initial Public Offerings (IPOS) annually; however, companies going public often experience an underpricing anomaly noted in previous research that is often found to be associated with “hot” IPO markets. This study uses a survey methodology to examine for IPOS anomalies and why they occur including underpricing and a long-run price underperformance anomaly. Survey results show that there is no under pricing in the Tehran Stock Exchange (TSE); however, overpricing has been noticed. In addition, long-run price underperformance has been reported six months after an IPO, suggesting that there is inaccessibility to information for investors at the time of an IPO. A review of the variables that are associated with IPO underpricing suggests a relationship between industry type and under pricing. Moreover, there is a relation between earnings before taxes for three years before an Initial Public Offering (as an index of quality, risk, and reputation of the firm), and the percentage of issued equity in the long run (as an index of agency cost) and long-run price underperformance.

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### **1. Introduction**

**I**nitial Public Offerings (IPOS) are often not for newly-established, firms since most firms have been in operation for at least three years. Hence the term "initial" in IPOS refers to the first time that a firm enters the stock exchange and offers shares to external shareholders. This is the time that the company's managers realize that being listed in the stock exchange contributes to the attraction of capital in terms of new shareholder equity capital, as well as lower borrowing

costs with recognition as a public company. The number of IPO shares depends on a company's pre-IPO ownership structure. As a result, if there is ownership concentration in the firm, and past shareholders think that they will lose their control over the firm's affairs because of the IPO, fewer shares will be issued. These shares will be distributed in a way so large investors will be kept out (Alavi, Kien Pham, and My Pham, 2006). There are different methods of doing an IPO, the selection of which depends on the rules and regulations of a particular country, including the methods listed below:

#### *Fixed Price Offering*

With this method, initially the offering price is determined. Later, orders will be received from investors that are shareholders to the part or all of the stocks (Radfar, 2008).

#### *Call Auction*

This method is basically used at the time of a public bonds offering, utilizing privatization on the basis of the change in ownership structure. This is rarely true in the case of IPOs as it is publicly believed that book building is more efficient at the time of IPO.

#### *Book Building*

This method is more common than others. The process begins by advertising about intended stocks by underwriters, and then they receive orders from investors before determining the offering price.

#### *Dutch Auction*

In this method, in the beginning underwriters determine high prices for the stocks. Then, they reduce prices to the point that the investors are encouraged to buy a certain number of shares. Later, stocks will be dealt with using the same method. This process will continue until all stocks are sold. Therefore, it is quite probable that different units of stocks are sold at different prices (Khodadadi and Rezaieyan, 2006).

Pricing is the key to the success or failure of an IPO. The first day return, in turn, is critical to determining the suitable price (Kaneko and Pettway, 2003). The determined IPO price should lead to maximization of firm value, compensation for costs of information-seeking by investors, and cover the risks of investors as buyers of shares from a firm that has not offered shares so far (Scherman, 2000). In accordance with the "Best Price Range" theory, a price that should be consistent with the preferences of different groups of investors, and is a function of the market

general price (average), and the industry general price (average) and the firm value). If stocks are dealt within a desired trading range, the firm prestige will be ensured, and the volume of transactions will increase (Schwert, 2003).

Listing of a firm on the stock exchange has benefits as well as anomalies, which according to some experts are not quite real and emerge in research studies only on the surface (Rubinstein, 2000). The most important anomalies of IPOS are "long-run price underperformance," "under pricing," and "hot IPOs." In other words, they are "long-term returns lower than the market return," "short-term returns higher than the market return," and "bullish market returns." The first two cases are more common; therefore, they have been the subject of many studies around the world, as well as this study.

## **2. Long-run price underperformance**

Most firms will encounter price underperformance in a period of three years after the IPO. This is mainly attributable to three factors. First, an artificial price rise by underwriters results in a price decrease, when they cut their support and the price, reaches its real market value (Ritter, 1991; Jenkinson and Ljungqvist, 2001). Miller (1977) believes that stock prices in IPOs are often determined by optimistic investors, but prices adjust over time and by dispersing more information, long-run returns decrease. In fact, long-term performance has a negative relationship with the unrealistic expectations of investors (Ritter, 1991, Servaes and Rajan, 1995). It is of note that assessing this theory is hard because it is difficult to measure people's thoughts and ideas at the time of an offering.

The second theory tries to build a relationship between long-run price underperformance and agency costs. Michelson et al., (1997) surveyed the relationship or lack of a relationship between long-run underperformance and firm ownership in the American stock exchange and found nothing, whether it is within a year or ten years after the IPO. Jain and Kini (1994), however, found a strong and positive relationship between long-run price underperformance and consistency in ownership structure after the IPO. The third theory deems that long-run price underperformance is a result of errors in measurement or benchmark selection (Thakor and Hughes, 1992). Brav et al., (1998), considering the long-run price underperformance of the IPO as a function of managers' decisions and firm performance, found more IPO underperformance in:

1. Smaller firms;

2. Firms that were profitable three years before the IPO;
3. Firms with more debts compared with assets before the IPO; and
4. Firms with a small turnover within a year before the IPO.

Bradley et al., (2002), Brav and Gompers (1998), and Ofek and Richardson (2003) believe that the main reason for long-run price underperformance is the lock-up period. This refers to the period after a firm becomes a public joint entity through the IPO when the underwriter concludes a contract with the internal staff and the main shareholders, prohibiting the sale of firm's stocks for a specific period of time. The minimum prohibition period, according to the regulations of the Stock Exchange is 90 days. Any time extension (3 to 24 months) will depend on the underwriter. The main problem is the end of the lock-up period when the internal staffs rush to sell their own shares for possible profits, which in turn will reduce the price of the stocks.

Khurshed, Mudambi and Georgen (1999) surveyed a sample of 240 IPOs by non-investment firms in the London stock exchange between 1991 and 1995. They showed that 26 percent of the surveyed firms experienced a loss within a 3-year period before the IPO, and 12 percent had high debts. This indicates that on the London Stock Exchange, like the US Stock Exchange, and unlike German Stock Exchange, firms do not have IPOs at their highest level of performance. In fact, some of them do this just to improve their balance sheet. The final result is that past performance of a firm is not a dependable predictor of its future performance (Krinsky and Rotenberg, 1989; Ritter, 1991).

### **3. Under pricing**

Under pricing, reaching 388% in some countries (Dastgir and Alikhani, 1385), is defined as "the differential of a stock's sale price at the IPO and the final price of the last trading on the first day" (Ljungqvist, 2005; Cai, Ramchand, &Warga, 2004) or "the change made in final price at the end of the first trading day, following the method of the Stock Exchange" (Ritter, 1986). In other words, under pricing happens when the issuing firm determines the offering price remarkably lower than its market value. As a result, the initial investors of the IPO gain a marked return only by trading of shares on the first day of purchase (Dastgir and Alikhani, 2008).

There are many theories about under pricing, but none can give a complete explanation by itself. The four main theories about under pricing are asymmetric

information, institutional factors, supervision factors, and behavioral factors, of which asymmetric information is preferred over others (Ljungqvist, 2005). According to this theory, one of the sides of the IPO has more information than others. Asymmetric information has three versions. First, the investment bank is more informed about the market demand, so under pricing is used to induce optimal selling (Baron, 1982). Second, the issuing firm has more information about its value; therefore, the more valuable the firm is, the better it uses under pricing as a signal to the market<sup>1</sup> (Welch, 1989). Third, some investors in the market are more informed than others, so they avoid participating in overvalued IPOs. At this time, firms use under pricing to attract uninformed investors (Rock, 1986).

Institutional theories focus on three features of the capital market including: litigation, banks' price stabilizing activities once the trading starts, and taxes. Theories based on supervision factors argue that under pricing helps reduce intervention by outside investors once the company is public. Behavioral theories assume either the presence of 'irrational' investors who bid up the price of the IPO shares beyond true value, or that issuers suffer from behavioral biases causing them to put insufficient pressure on the underwriting banks to have under pricing reduced. The base of all this theories is that different accessibility to information between IPO partners will lead to under pricing (Ljungqvist, 2005).

The other theory about under pricing is the trade-off theory. Initially it argues that buyers will buy stocks at a cheaper price and wish to compensate for the costs of gathering information. Otherwise, they will not have any motivation for buying (Benvensite, Spindt, 1989).

#### **4. Hypotheses for Examining Underpricing**

Some of the hypotheses explaining under pricing are:

##### **(1) Winners Curse**

This theory explains that underwriters use under pricing to attract uninformed investors (Grinblatt, Titman, 1995). Because of information asymmetry, informed

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<sup>1</sup> Signaling theory : By this theory, the issuing firm uses under pricing to give a positive signal to investors about high first day return, so that they can solve information asymmetry problem between the issuing firm and investors (Welch , 1989). So, the better a stock is, the more underpriced will it be in the IPO process and it will compensate expenses through profits of future issuing at higher prices in the secondary market (capital increase).

investors do not buy the mentioned stocks, so underwriters use this strategy to attract uninformed investors.

## **(2) Market feedback theory**

When investment banks can not estimate the market demand curve about new stocks, they use under pricing to get information from investors. They continue using this method until they get enough suitable information about the market value of the firm.

## **(3) Bandwagon**

Bandwagon happens when potential investors, in addition to their personal information, pay attention to the investors' behavior. This means that an investor buys specific stocks when others buy them subsequently issuers use this phenomenon to attract many groups of potential investors.

## **(4) Lawsuits prevention**

Some firms use under pricing as a way to reduce lawsuits so as to reduce the probability of depreciation of stock prices in months after the IPO. This method is expensive, however, practiced in some countries with less IPO regulations, such as Finland (Dastgir and Alikhani Bouani, 2006).

Aggarwal, Krigman, and Womack (2002) studied about strategic under pricing by firm managers. They found that if managers have more stocks, they will use under pricing to maximize their own wealth by selling stocks at the end of the lock-up period.

## **(5) Hot IPOs**

The issue of hot stocks is about when the demand for stocks is more than their supply; therefore, buying struggles induce higher prices. It also depends on the industry that the firm belongs to. Some characteristics of hot IPOs are:

1. More under pricing.
2. More number of stocks in the IPO.
3. A large difference between the first day returns of hot and cold (bearish) IPOs.
4. Higher standard deviation of new stock returns (Damuri, 2002).

Also, Helweg and Liang (2003) showed that by more hot IPOs, under pricing would appreciate.

## 5. Research Methodology

This research surveys IPOs on the Tehran Stock Exchange (TSE) by firms that are not part of investment companies and financial intermediation from 1998 to 2009. Also, their fiscal year must end on the last day of the solar year. The statistical sample encompasses 103 firms listed on the TSE.

The dependent variables of this study are under pricing and long-run price underperformance.

This article surveys the relationship between these variables and other factors mentioned below.

### *A. Factors affecting under pricing*

#### 1. Accounting information (data are for one year prior to the IPO)

- Net income / total assets
- Cash
- Current ratio (current liabilities / current debts)
- Debt / total assets
- Total assets
- Revenue

#### 2. Firm ownership information

- The IPO buyers (numbers)
- Ownership structure after the IPO (if there is a wholesale shareholder, with 50 percent or more stocks- they get 1 and otherwise 0)
- Shares issued in IPO / post-IPO total shares <sup>2</sup>
- post-IPO total shares

#### 3. Market situation

- The Average daily price index (20 days prior to the IPO)

#### 4. Issue information

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<sup>2</sup> In this article, long-term means 1 day, 1 month, 3 months, 6 months, 9 months and 12 months after the IPO.

- Number of IPO stocks (firm capital / 1000 or the nominal value of stocks)
- Price revision % [ offer price – average lower and higher price at first day /average lower and higher price at first day )-1]
- industry ( dummy )

### ***B. Factors affecting long-run price underperformance***

#### 1. Quality, risk and reputation of the firm

- age (difference between registration date and offer date)
- the average pre-tax profits (or losses) for the last three years before the IPO

#### 2. Firm size

- net assets (total assets – total debts for one year before the IPO)
- market value of the firm (derived from the day price of one stock times the number of firm stocks)

#### 3. Agency costs

- post-IPO total shares

## **6. Research Hypotheses**

In this study three main hypotheses postulated as follows.

- (1) There are IPO anomalies in TSE.
- (2) Underpricing is not related to accounting information, firm ownership information, market situation and issue information. The variables used to examine this hypothesis include return on assets (net income/total assets), cash, the current ratio, the debt to total assets ratio, total assets, total revenue, firm ownership information and ownership structure after the IPO, IPO buyer characteristics, the number of shares issued in the IPO and post IPO total shares, market conditions, the average daily price index, issue information, the number of IPOs issued at the time, price revision, and industry type.
- (3) Long-run underperformance is not related to quality, risk, and reputation of the firm and the long-run underperformance. Variables used to test

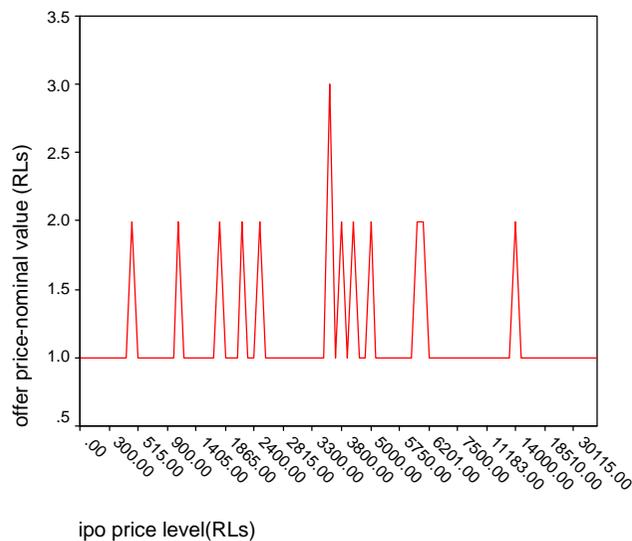
this hypothesis include firm age, average pre-tax profits, firm size, net assets, market value, proxies for agency costs, and post IPO total shares.

## 7. Results of the study

Before any analysis, one should make sure about the normality of data distribution. The results of K-S tests<sup>3</sup> showed abnormality. This problem is solved by the deletion of outback dots. The two following graphs present some facts about the IPO prices and their situation in the long run. As mentioned before, parameters of under pricing estimation are offer price and the price of the last trading on the first day; but due to inaccessibility of information for all the sample, the formula changed to "the difference of offer price (or the first trading price in the IPO day) and the nominal value of each stock (or 1,000 Rials)." The hypothesis of under pricing was tested a using paired test, and the results show no relationship between market return and the IPO return. Also, because of negative lower and upper limits, the average market return is more than the average IPO return.

Graph 1 shows overpricing in the TSE rather than nominal value. In other words, the TSE has a different anomaly trend than other stock exchanges. Therefore, the first hypothesis about the presence of the underpricing anomaly is disproved.

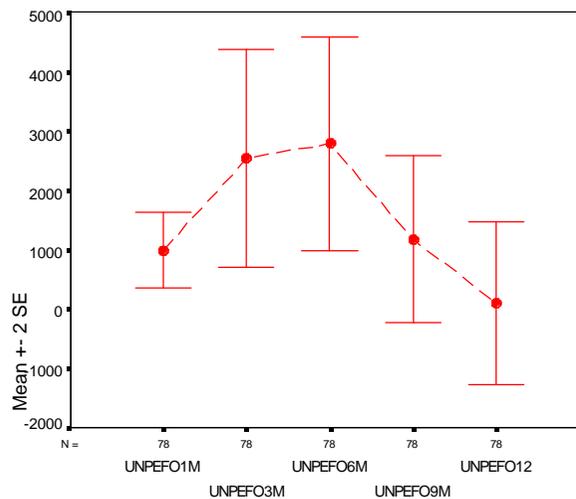
**Graph 1**



<sup>3</sup> Kolmogorov – Smirnov test

Graph 2 shows the price situation in periods of 1 day, 1 month, 3 months, 6 months, 9 months and 12 months after the IPO. A deeper look on the graph reveals that stock prices of the IPO increase with the appreciation trend; then six months after it, the trend would decrease steeply. In the other words, the long-run price underperformance would be noticed in the TSE with a 6-month time lag after the IPO.

**Graph 2**



The next step is focused on variables relation to underpricing using a regression analysis. Results show that except for a relation between industry type and underpricing, and average pre-tax profits and post-IPO shares and long-run performance, for hypothesis two other variables are insignificant, supporting no relationship between issue information and underpricing in hypothesis 2, and no relationship between quality, risk and reputation of the firm and agency costs and long-run underperformance.

The regression equation of hypothesis 3 on earnings before taxes is:

$$\text{Price performance (1 month)} = 709.996 + 3.173 \quad \text{EBT}$$

$$\text{Price performance (3 months)} = 1548.342 + 0 \quad \text{EBT}$$

$$\text{Price performance (6 months)} = 2011.997 + 0 \quad \text{EBT}$$

And the equations of the main hypothesis (3-3) and the sub-hypothesis 3-1-1 are:

$$\text{Price performance (1 month)} = - 350 + 956.013 \text{ aftipo (1 day or 1 month)}$$

$$\text{Price performance (3 months)} = - 5010.088 + 5636.325 \text{ aftipo (1 day or 1 month)}$$

$$\text{Price performance (6 months)} = - 3469.567 + 4705.36 \text{ aftipo (1 day or 1 month)}$$

The final results of the study demonstrated that there is overpricing about IPO in TSE. Also, long-run underperformance would be made with a six-month time lag. There is a relationship between under pricing and industry. Also, the average pre-tax profits, post-IPO total shares in 1 month, 3 months, and 6 months after the IPO showed a relation with long-run underperformance.

## 8. Conclusion and remarks

This article surveyed the anomalies of the initial public offering in 103 firms listed on TSE. The results of price investigation in the long run revealed that 1 and 3-month periods have similar trends, different from 6, 9, and 12-month periods and the intensity has been increasing at 1 and 3 months and after that, the trend would decrease until the level would get zero.

The investigation shows that investors have limited access to information at the time of the IPO. Then by revealing interim reports, the problem of their decision making would be eased. In other words, there is the problem of inefficient and insufficient information about IPOs in TSE therefore we suggest that TSE should use such mechanism to solve the difficulty and ensure investors about probable risks.

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