INITIAL UNDERPRICING AND TRANSFER OF SHARES ON THE TUNISIAN STOCK EXCHANGE

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Abstract

In this empirical study, the incidence of the shares transfers by the original shareholders on the degree of the initial underpricing is studied, using a sample of Tunisian candidates companies over the 1992-2006 period. Our empirical results make it possible to confirm the existence of a significant initial underpricing of about 19% and which depends closely on the behavior of shares transfer. More precisely, the original and the controlling shareholders, in order to limit the transfer of wealth towards the new shareholders, reduce the degree of IPO underpricing.

Keywords: Initial Public Offerings, Initial Underpricing, Ownership Structure, Agency Theory, Entrenchment Theory

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1. Introduction

Underpricing has been the subject of numerous empirical studies. It has been observed in several countries all over the world and is a mysterious phenomenon which is linked to the majority of newly listed companies. It appears as a positive divergence between the quoted and offer prices. Among these studies, we refer to those of Loughran, Ritter and Rydqvist (1994) and Broye and Schatt (2001) who show that the underwriters issue the shares to the public at a price lower than the "fair" price. This resulted in an abnormally high return in the initial trading days.

The work of Loughran & al. (1994) summarizes the results of a number of important studies on the underpricing of Initial Public Offerings (hereafter IPOs) in 25 countries. In most of these countries there is persistently positive initial-day return (or underpricing) for all initial issues. The highest average initial stock returns (388%) were recorded in the Chinese IPO market and the lowest (4.20%) in the French IPO market. According to Clendenning and Associates (2001), the shares issued on the Toronto Stock Exchange (TSE) are underpriced on average by 5.80% (14% according to Jog and Hitsman, 2000) compared with 10.90% on the New York Stock Exchange (NYSE) and 49.60% on the NASDAQ. Loo and Riding (2001) also noted that the IPO underpricing on the NASDAQ is greater for the technological companies than traditional ones.

The initial underpricing phenomenon has various theoretical explanations in the financial IPO literature. For some writers, the anomaly stems from a problem of asymmetric information between the investment bank and the issuing firms (Baron, 1982) or between a group of informed investors and another, uninformed (Rock, 1986). According to Aggarwal and Rivoli (1990) and Ritter (1991), the IPO underpricing stems from excess optimism on the investor's part, who pay a higher price than the "fair" price defined by the underwriter. Another explanation supposes that the underwriter must offer a price voluntarily lower than the "fair" market price in order to remunerate the risk taken by the investors, who are unable to estimate future cash flows distribution correctly, because of the uncertainty and asymmetric information concerning this operation. The underpricing also makes it possible to attract a certain category of better informed investors, in general institutional, who demand compensation for their part in the IPO process (Rock, 1986; Beatty and Ritter, 1986). Welch (1992) shows by his "cascade» theory that IPO underpricing is used by the underwriters to start a massive movement of purchasing at the IPO time. Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Ruud (1993) justify the underpricing by the presence of a price support by the underwriters during the first days of stock trading. More recently Connelly & al. (2004) explain the initial underpricing phenomenon by a proxy related to asymmetric information as the ex-ante uncertainty. Venkatesh and Neupane (2004) attribute this to the regulatory environment, and to some characteristics specific to each market and to the periods of introduction (cold vs. hot)[1].

If several hypotheses have been put forward to explain initial underpricing, few studies have been concerned with the possible relationship between the evolution of the shareholding structure and the undervaluation of the new listings. However, the IPO has some important effects on the firm governance

[1] Generally, the issuers time their IPO to list in periods when investors are especially optimistic about the growth potential of companies going public.

system. In addition, this process generates a loss of control for the current shareholders, since it consists of selling a large block of shares. Moreover, the new shareholders intervene in the company management with a view to maximizing its market value, while the original shareholders seek to maximize their personal remuneration and assets. The result is a transfer of wealth from current shareholders in favor of new investors. Accordingly, one might think that the evolution of the IPO current ownership structure determines the listed company behavior on the market (Roosenboom and van der Goot, 2005) since the degree of the underpricing depends on the extent of the costs sustained by the IPOs firms.

The present study considers the impact of shares transfer by both the original and the controlling shareholders on the degree of underpricing at the IPO time in the Tunisian Stock Exchange (TSE). The comprehension of the impact of the behavior of stock transfer on the initial IPO underpricing is of great interest given the policy adopted by the Tunisian Financial Market Council (FMC) to promote the stock market by the creation of an alternative market. The results should represent an important first step in understanding the IPO market in Tunisia and yield additional insights regarding determinants of IPO underpricing in emerging capital markets.

For this reason (as Broye and Shatt, 2003), the corporate governance is described using the transfer of old shares by the original shareholders. This kind of transfer is found more frequently used than the new issues transfer[2]. The remainder of the article is divided into six sections. The next section highlights some empirical studies focusing on the relationship between the transfer of shares and the degree of IPO underpricing. In section 3 and 4 data, study sample, methodology and variables used in our empirical analysis are described. Section 5 reports regression results and offer robustness analyses. The concluding section summarizes the major findings.

2. The Repercussion Of The Transfer Of Shares By The Controlling Shareholders On The Ipo Underpricing

Recently, the study of samples of newly listed companies in the stock market, notably those of Hill (2006), Roosenboom and Schramade (2006), Yang and Sheu (2006), Wang (2005) and many others, on one hand put the emphasis on the concentration of capital and on the other, on the evolution of the shareholding structure as explanatory variables of the IPO underpricing. Their results show that the shareholding structure and the ownership concentration significantly affect the degree of the initial underpricing, especially in the context of emerging financial markets[3] (La Porta & al., 2000).

Broye and Shatt (2003) consider the incidence of the share transfers by the original shareholders on the degree of the initial underpricing in France. Their results show a curvilinear relationship. Habib and Ljungqvist (2001) suggest an inverse relation between the transfer of shares and their undervaluation. This result is contradictory to that found by Leland and Pyle (1977) who show that a significant share transfer signals a limited profit prospect of the firm and consequently incites shareholders to proceed with the devaluation of shares to attract potential investors.

Whatever the significance of this relationship, adequate theoretical explanations in the financial IPO literature are found. In fact, the signaling theory stipulates that the larger the share part sold, the larger the IPO underpricing[4]. The entrenchment theory bears out that the shareholders are incited to reduce the initial underpricing when they sell a large number of shares[5].

3. Data And Study Sample

Before presenting our study results, the work sample is described.

3.1. Data Sources

All companies newly listed on the Tunisian Stock Exchange (TSE) between March 1992 and March 2006 are identified. For all these firms, the characteristics of the issuers (sector, age, size, debt level, year founded) and the issuance (introduction date, issue date, offer price, number of shares available to the public, capital taken up, auditor and financial intermediary's identity) are taken from the candidate's IPO prospectuses out from the Tunisian FMC. The data on the closing prices and the market index are taken from the daily price index of the TSE. Information on the shareholding structure before and after going public is collected from IPO prospectus.

3.2. Study Sample

Our original sample comprises 47 Tunisian IPOs firms, candidates for listing on the stock market. However, we were able to consult the IPO prospectus for only 40 of them. Among these 40 IPO companies,

[2] 25.63% versus 2.78% on average.

[3] Claessens et al. (2000) suggest in the context of emerging financial markets that the presence of less stringent regulation means that big shareholders have an unhindered ability to pursue private benefits at the expense of other minor shareholders. Chen and Strange (2004), have proved in the case of poor regulatory environment that high concentration ratio leads to lower initial IPO return as the market correctly identifies the ability of the dominant stockholder to pursue private benefits easily and without penalty.

[4] The managers, who are supposed to be better informed than the other investors, offer them a premium to encourage their participation in the IPO process.

[5] The aim is to protect the profits linked to the control of the original shareholders and limit the wealth losses incurred after listing on the Stock Market Exchange.

32 were retained, those which produced a detailed account of their shareholding structure.

Table (1) shows the sample distribution for each year in terms of issues number. It is clearly evident that the annual rate of new listings on the TSE by selling existing shares, was progressing up to 1999. This coincided with Tunisian government resolution to lighten its control of public companies. Further more, in the year 2000 and from 2002, very few new listings have been observed which shows that recourse to the stock exchange is not necessarily an alternative priority for financing. Finally, we see that, except for a lull in the mid 90's, resorting to the financial markets to raise capital remains modest compared to developed markets.

Table 1. Constitution and annual distribution of the study sample listing (1992-2006)
For each year the total number of IPO firms in the Tunisian Stock Exchange, the number of available prospectuses, the number of the candidate companies in the study sample and the size of the offering are indicated.

Year	Number of IPO	Available Prospectuses	Sample of work	Size of offering (000.Dinars)
1992	2	1	1	9 000
1993	3	2	1	6 412.859
1994	3	3	2	4 566.691
1995	6	6	3	31 757.042
1996	3	2	2	22 622.527
1997	6	6	4	1 6530
1998	4	4	3	21 464.375
1999	6	6	6	30 859.187
2000	1	0	0	0
2001	5	4	4	2 8515
2002	3	2	1	6 158.717
2003	1	1	1	5 544
2004	0	0	0	0
2005	3	3	3	19 783.500
2006	1	1	1	5 940
Total	47	41	32	20 9153.898

4. Methodology Of Research

The methodology used to study the incidence of transferring shares on the IPO underpricing, consists of regressing the degree of the underpricing on variables describing the fraction of shares transferred.

4.1. Variables. Measures

In the financial literature relating to the study of the initial underpricing of newly listed companies, several measurements of the IPO underpricing are recorded. In fact, the most widely used approach to examine the level of initial stock returns of the newly listed shares is the method of Unadjusted Initial Underpricing (IU). More precisely, the IU is calculated using the following equation:

$$IU_i = \frac{P_{i1} - P_{i0}}{P_{i0}} \quad (1)$$

Where

P_{i0} **:** the initial offer price for the i[th] candidate company.

P_{i1} **:** the average closing prices for the i[th] candidate company on the first five trading days[6].

Concerning the explanatory variables describing the shares transfer by the original shareholders, the following variables are defined according Broye and Schatt (2003):

- ***LnORIOWNER*** **:** Is the napierian logarithm of one, plus the proportion of the old shares offered by the original group of shareholders at the IPO time (the number of old shares transferred divided by the total number of shares existing before IPO).
- ***LnCONOWNER*** **:** Is the napierian logarithm of one, plus the fraction of old shares offered by the original controlling shareholders (the number of old transferred shares divided by the total number of shares existing before IPO). The blockholders who own 5% or more of the stocks are retained as control shareholders.

[6] We decided to calculate the initial underpricing on the first five days as the newly listed stock may not be quoted on the stock exchange at first. This is because of the high demand from investors result in a rising reservation of the said stock. For example, during listing, Tunisair shares were sought by 150.000 subscribers for an offer which was subscribed 3,8 times.

Others such as Morck & al. (1988) point out that the extent of underpricing also depends on the share part which is still held by the controlling shareholders. In fact, the larger the proportion after going public, the larger the extent of IPO underpricing, as the controlling shareholders are able to compensate for the costs resulting from the initial underpricing, by the advantages they gain within the company as controlling shareholders. This fraction is represented by the variable ***LnTOPOWNER***, calculated as the napierian logarithm of one, plus the proportion of the shares held by the first and second controlling shareholders after the IPO.

In addition, the various studies found in the financial IPO literature, concord with the fact that the initial IPO underpricing increases with ex-ante uncertainty. At this point it is interesting to introduce other control variables describing this uncertainty. These variables are defined below:

- ***SIZE*** **:** Is the offering size measured as the number of shares issued on the market, multiplied by the final offer price. The results communally accepted in the financial IPO literature stipulate that shares initial returns are negatively linked to the offering size (Henry & al., 2003; Faugeron-Crouzet and Ginglinger, 2002).
- ***AGE*** **:** The age of the candidate company measured by the difference between the number of years of listing on the stock exchange and the creation of the company[7]. The ex-ante risk of the candidate company supposedly grows with age. The more recent the activity of a company, the more difficult it is to predict its future development, and thus it should show a larger initial underpricing (Bilson & al., 2003; Broye and Schatt, 2003; Ritter, 1991; Venkatesh and Neupane, 2004; Connelly & al., 2004).
- ***LEV*** **:** The financial leverage which corresponds to the relationship between the book value of debts[8] and the book value of total assets. It has been established that a high leverage ratio before going public, raises the ex-ante uncertainty (Venkatesh and Neupane, 2004).
- ***REP-A:*** A dummy variable measuring the reputation of the auditor. It is equal to 1 (one), if the auditor is one of the "big four"[9], and 0 (zero) otherwise. The reputation of the auditor effectively reflects the value of the candidate company and is linked to a lowest IPO underpricing (Clarkson & al., 1992).
- ***REP-IF:*** Dummy indicator of the financial intermediary reputation. It is equal to 1 (one) if the IPO operation is driven by a well renowned underwriter and 0 (zero) otherwise. The rating of the underwriter is based on the size of the issues they have managed as a listing agent. Thus, if the underwriter introduces a company of which the issuance size is superior (respectively inferior) to the average, the underwriter is supposed to be renowned (unrenowned). Clarkson and Merkley (1994) and Chemmanur and Fulghieri (1994) show that the initial IPO underpricing is lower when the candidate company uses a prestigious financial intermediary.

[7] After Loughran and Ritter (2001) and Ljungqvist and Wilhelm (2003), we have used the date of the creation of the candidate company and not the year of its registration in the commercial company register. Indeed, a company can have started its activity before acquiring the legal entity.

[8] Short and long-term debts as they appear in the audit report of the candidate company before listings.

[9] KPMG, Deloitte, Ernst & Young and Price Waterhouse Coopers .

4.2. Methodology

The basic objective of this study is to identify the repercussion of shares transfer on the degree of the initial IPO underpricing. For this purpose, the proportion of existing shares proposed by both the original and the controlling shareholders at the IPO date is taken into account. We have built the following regression models to test some of the proxies of information asymmetry model along with the shares transfer variable. The regression models thus retained are as follow:

$$IUi = \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnTOPOWNER_i + \beta_{7i}\, LnORIOWNER_i + \varepsilon_i \quad (2.1)$$

and

$$IUi = \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnTOPOWNER_i + \beta_{7i}\, LnCONOWNER_i + \varepsilon_i \quad (2.2)$$

To estimate these two models, an Ordinary Least Squares (OLS) regression is applied. Besides, as the distribution of the initial underpricing variable deviates from a normal one [10] and given the narrowness of our study sample, the "bootstrap" method is applied to obtain efficient estimators.

5. Discussion Of The Empirical Results

The descriptive results concerning the different variables presented above are set out successively with those of the regression models.

5.1. Descriptive Analysis

The descriptive analysis provided in Table (2) (Panel A) shows that Tunisian candidate companies wait, on average, 20 years before being listed on the stock exchange, which is remarkably low if compared to Italy and Japan IPOs but similar to other European samples. It reveals also that these newly listed companies, even if they are small, are linked to the phenomena of underpricing, as in most stock markets. The initial stock return made by an investor who is able to sell the stock acquired at the initial offering price after the first five trading days, is on average

[10] Shapiro wilk's statistics were calculated. The probability p which is associated, deads us to reject the null hypothesis of normality. These results are available on demand.

19.22%. This underpricing is significantly different from zero at the level of 1%. Our results confirm those obtained in the majority of studies. Concerning the Tunisian studies, the initial underpricing previously detected is smaller than that found in the study of Ben Naceur and Omri (1997) which showed an average underpricing of 29.58% over a study period between 1991 and 1995. It is also, smaller than the one noted by Ben Naceur and Ghanem (2001), being 27.82% over the 1990-1999 period. It must be pointed out that these authors used a different measure from the one used in this study. The initial IPO underpricing recorded in the developed capital markets shows a smaller devaluation: 10% on the American market, 6.44% on the Canadian market and 13.23% on the French market[11]. The degree of initial underpricing recorded in this article is distinctly smaller than that found on the stock market of other emerging countries. For example, the Chinese capital stock exchange shows an IPO underpricing of 388%, that of Malaysia 80.30% and South Korea 78.10%[12].
It appears clearly from (Panel B), that the level of the IPO underpricing is not stationary. In fact, it reached a maximum of 61.36% in 1995 and fell to a minimum of 0.90% in 2002. Panel C of Table (2) reveals that half the companies in the study sample called on the services of a reputable underwriter. Moreover, 53.13% of the companies are checked by high repute auditors at the IPO time.

Concerning the behavior of the old shares transfer, it can be noted that the controlling shareholders are those who sell a large part of their shares, on average 21.36% of the stock, for a total of 25.63% of shares sold. In spite of this, a large proportion of the shareholding in Tunisian candidate companies persists after going public, given that the controlling shareholders still hold about 2/3 of the shares post-IPO: the first two controlling shareholders possess more than 40%[13], not noticeably different from other markets[14]. This highlights clearly that controlling shareholders retain the majority of the capital after the IPO.

It appears that the IPO market in Tunisia is largely undervalued. This IPO underpricing represents, as Kooli states (2000), an indirect cost linked to the IPO process which the issuing company must bear. Thus, the underpricing can influence the choice of financing of Tunisian companies and dissuade them from seeking the capital necessary to their economic growth by issuing stocks.

We shall try to check the behavior of share transfer of existing shareholders influence underpricing of Tunisian candidates companies in the following section.

5.2. Analysis Of The Influence Of Shares Transfer On The Degree Of Initial Underpricing

The results obtained from the regression models (2.1) and (2.2) confirm the influence of the different explanatory variables on the degree of IPO underpricing. The results are given in Table (3). Because of the multicolinarity problems, different reduced models are examined. It is noticed that the shares transferred by the original shareholders (Ln ORIOWNER) exert a negative influence on the initial underpricing. As far as the transfer of shares by the controlling shareholders is concerned (Ln CONOWNER), it seems that they also influence the IPO underpricing in a negative fashion. These results were endorsed and became even more significant when controlling for the fraction of shares still held by the controlling shareholders after going public. This leads us to think that the controlling shareholders do not necessarily profit from the greater private advantages resulting from the listing of their company on the stock exchange. This could be due to the fact that the Tunisian candidate companies introduce only a small part of their capital and consequently the variation in the fraction of shares held by controlling shareholders after the operation is insignificant.

In short, the negative signs of the coefficients associated with the variables describing the behavior of share transfer supports further the entrenchment theory according to which the original and controlling shareholders are urged to limit the initial IPO underpricing, in order to reduce their potential wealth losses following the transfer of a part of their companies shares to the public. These assumptions confirm the results put forward by Demsetz and Lehn (1985) and La Porta & al. (2000).

Concerning the relationship between the underpricing and control variables, it confirms the results of most of the empirical studies, with the exception of the auditor-reputation variable (REP-A) which has a positive impact on the IPO underpricing, without, however, being statistically significant. It is also the case for the leverage variable (LEV), which is negatively and statistically correlated to the degree of the IPO underpricing (at the level of 5%).

[11] See Kooli (2000).
[12] For a summary of past results see Loughran et al. (1994) and Ritter (1998).
[13] The detailed results concerning the development of the original shareholders structure and the two controlled shareholders before and after listing on the stock exchange, are available on demand.
[14] Cassia et al. (2004), Wang (2005), Boubaker and Labégorre (2007), …

Table 2. Descriptive statistics for study sample listed on the TSE between March 1992 and March 2006

This table presents the descriptive statistics (average, median, standard deviation) of the candidate companies carried out between March 1992 and March 2006 on the TSE, taking into consideration continuous variable (Panel A), distribution of the IU per year (Panel B) and dummy variables (Panel C).

- **Panel A- Continuous Variables:** ***AGE*** = the age of a firm in years measured by the difference between the establishment date to the IPO date; ***LEV*** = the book value of pre-IPO debt (short and long term) divided by the book value of total assets; ***SIZE***= napierian logarithm of the amount of the stockholders' equity emitted in term of local currency at the IPO time; ***IU*** (the measure of Initial Underpricing) = (average of the closing prices of the first five trading days - issue price)/issue price.

Characteristics of the IPO firms on the TSE (N = 32)			
	Means	Median	standard deviation
Offer volume (number of stocks)	398 369	324 150	283 332
Percentage (%) of old stocks proposed by the original shareholders	25.63	20.69	23.13
Percentage (%) of old stocks proposed by the controlling shareholders	21.36	20	15.71
Offering size (MD)	6 536.059	5 522.396	4 562.648
Candidate company age (in year)	20.20	19.08	15.99
Debts at the IPO time (in %)	40.35	42.38	26.65
Initial Underpricing (IU) (in %)	19.22	6.09	35.77

- **Panel B- Distribution of the initial IPO underpricing per year:** The total sample is composed of 32 IPO firms listed in the TSE between March 1992 and March 2006. The initial underpricing is calculated according to the following measurement: ***IU*** = (average of the closing prices of the first five trading days - issue Price)/issue Price.

Years	Number of IPOs	Mean of IU	Median of IU
1992	1	4.57	4.57
1993	1	0.66	0.66
1994	2	8.97	8.97
1995	3	67.36	6.07
1996	2	3.62	3.62
1997	4	11.79	4.62
1998	3	8.55	5.65
1999	6	26.04	28.79
2000	0	-	-
2001	4	12.37	3.26
2002	1	0	0
2003	1	12.12	12.12
2004	0	-	-
2005	3	21.26	10
2006	1	28.21	28.21
Mean		19.22	6.09

- **Panel C- Dummies Variables:** ***REP-A*** = 1 if the auditor belongs to one of the "Big Four", and 0 otherwise; ***REP-UW*** = 1 if the underwriter is renowned, and 0 otherwise.

Characteristics of the IPO firms on the TSE (N = 32)		
	Sample	Frequency (%)
REP-A = 1	17	53.13
= 0	15	46.87
REP-UW = 1	16	50
= 0	16	50

To conclude, it is interesting to specify that the quality of the models used is relatively good with an R^2 of over 40%. This result tends to show that share transfers explain an important part of the IPO underpricing of new listings.

Table 3. The incidence of the shares transfers on the initial IPO underpricing (IU)

This table presents the results of the following regression models: $IUi = \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnORIOWNER_i + \varepsilon_i$ (Model 1); $IUi = \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnCONOWNER_i + \varepsilon_i$ (Model 2); $IUi == \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnTOPOWNER_i + \beta_{7i}\, LnORIOWNER_i + \varepsilon_i$ (Model 3); $IUi = \beta_{0i} + \beta_{1i}\, SIZE_i + \beta_{2i}\, AGE_i + \beta_{3i}\, LEV_i + \beta_{4i}\, REP\text{-}A_i + \beta_{5i}\, REP\text{-}UW_i + \beta_{6i}\, LnTOPOWNER_i + \beta_{7i}\, LnCONOWNER_i + \varepsilon_i$ (Model 4). The total study sample is composed of 32 IPO firm listed in the TSE over the period March 1992-March 2006. The t-statistics are reported in parentheses; ** and * denote statistical significance at 5 and 10 percent level, respectively. Adjusted R^2 values are indicated.

Linear regressions explaining the IU degree

	Ownership Variables				Control Variables					
	Constant	LnORIOWNER	LnCONOWNER	LnTOPOWNER	SIZE	AGE	LEV	REP-A	REP-UW	R^2
Model (1)	51.146	-0.610			12.872	-0.965	-0.621	18.617	-23.360	0.4494
	(2.87)**	(-1.74)*			(2.81)**	(-2.74)**	(-2.77)**	(1.45)	(-2.08)**	
Model (2)	50.799		-0.709		11.609	-0.909	-0.589	18.608	-24.884	0.4305
	(2.76)**		(-1.73)*		(2.55)**	(-2.56)**	(-2.59)**	(1.42)	(-2.15)**	
Model (3)	40.190	-0.731		0.203	13.175	-0.954	-0.598	18.646	-23.794	0.4531
	(1.23)	(-2.09)**		(0.40)	(2.79)**	(-2.66)**	(-2.55)**	(1.42)	(-2.06)**	
Model (4)	36.664		-0.719	0.260	12.124	-0.901	-0.563	18.623	-25.010	0.4366
	(1.10)		(-1.79)*	(0.51)	(2.56)**	(-2.49)**	(-2.39)**	(1.40)	(-2.09)**	

5.3. Tests of robustness

In order to test the robustness of our results, another measure of the initial IPO underpricing was used. The adjusted underpricing allows us to take into consideration the market fluctuations[15] (MAIU) (Yu and Tse, 2006; Su, 2004; Cassia et al., 2004; Marshall, 2004; Yanxiang Gu, 2003). The market-adjusted returns are generally expressed in the form of the return on a particular stock minus the return on the general stock market as below:

$$MAIU_i = IU_i - R_m \qquad (3)$$

Where

$$R_m = \frac{I_{i1} - I_{i0}}{I_{i0}} \qquad (4)$$

IU$_i$ **:** initial underpricing as measured by the expression (1).

R$_m$ **:** return of the market index benchmark for the first five trading days after fixing the initial price.

Ii$_0$ **:** the opening stock market index for the ith candidate company on the offering day.

I$_{i1}$ **:** the average closing stock market index for the ith candidate company on the first five trading days.

Regression models similar to those used in the equations (2.1) and (2.2) are then used by replacing the IU measure by MAIU as the explanatory variable.

The results presented in Table (5) have substantially changed. In fact, when the fraction of the shares transferred by the original shareholders at the public offering date has a significant negative effect on the underpricing, the controlling shareholders do not appear as a significant variable.

These results could be due to the fact that, in reality the relationship between variables describing the shareholding and the underpricing is not linear. In fact, certain studies have concluded a curvilinear relationship between the transfer of shares and the underpricing (Short and Keasy, 1999; Morck & al., 1988). In order to do this, we took from Kim & al. (2004) by introducing the models quadratic form and the cubic form of the proportion of shares transferred by the original shareholders as well as by the controlling shareholders, that is the following variables $(LnORIOWNER)^2$, $(LnORIOWNER)^3$ and $(LnCONOWNER)^2$, $(LnCONOWNER)^3$ to confirm the nonlinear hypothesis. The coefficients linked to the variables (LnORIOWNER) – (LnCONOWNER) and $(LnORIOWNER)^3$ – $(LnCONOWNER)^3$ should be positive and those of the variables $(LnORIOWNER)^2$ – $(LnCONOWNER)^2$ should be negative. The results presented in Table (5) show that the nonlinear relationship between the transfer of shares and the IPO underpricing (measured respectively by the IU and MAIU variables) is not significant. Thus, it appears that the conclusion pre-established concerning the impact of the behavior of share transfer by the original and control shareholders over the degree of IPO underpricing is well and truly measured by a linear relationship. On the other hand, our results seem to be affected by the choice of the underpricing measure.

[15] It is an average of 18.55% for the study period and is significantly different from 0 at a 1% level.

Table 4. Linear regression explaining the IPO underpricing according to MAIU (Market Adjusted Initial Underpricing)

This table presents the results of the following regression models: $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnORIOWNER_i + \varepsilon_i$ (**Model 1**); $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnCONOWNER_i + \varepsilon_i$ (**Model 2**); $MAIUi == \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnORIOWNER_i + \varepsilon_i$ (**Model 3**); $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnCONOWNER_i + \varepsilon_i$ (**Model 4**). T The total study sample is composed of 32 IPO firm listed in the TSE over the period March 1992-March 2006. The t-statistics are reported in parentheses; ** and * denote statistical significance at 5 and 10 percent level, respectively. Adjusted R^2 values are indicated.

Linear regressions explaining the MAIU degree

	Ownership Variables				Control Variables					
	Constant	LnORIOWNER	LnCONOWNER	LnTOPOWNER	SIZE	AGE	LEV	REP-A	REP-UW	R^2
Model (1)	49.084	-0.669			12.538	-0.921	-0.585	15.654	-20.697	0.4262
	(2.72)**	(-2.02)*			(2,70)**	(-2.59)**	(-2.58)**	(1.20)	(-1.78)*	
Model (2)	48.265		-0.645		11.297	-0.867	-0.554	15.562	-22.211	0.4041
	(2.59)**		(-1.49)		(2.45)**	(-2.41)**	(-2.41)**	(1.17)	(-1.85)*	
Model (3)	36.057	-0.678		0.241	12.898	-0.908	-0.558	15.689	-20.816	0.4315
	(1.09)	(-1.87)*		(0.47)	(2.70)**	(-2.50)**	(-2.35)**	(1.19)	(-1.74)*	
Model (4)	31.547		-0.622	0.307	11.906	-0.857	-0.524	15.581	-21.935	0.4128
	(0.93)		(-1.32)	(0.60)	(2.49)**	(-2.35)**	(-2.20)**	(1.16)	(-1.77)*	

Table 5. Test of the nonlinear relationship

This table presents results from cross-sectional regressions of IPO underpricing on ownership and control variable. In these models, we add the quadratic and cubic terms of ownership to test for non-linearity in the relationship between ownership and IPO underpricing.

Panel A – This panel presents the results of the following regression models: : $IUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnORIOWNER_i + \beta_{7i}\ LnORIOWNER^2_i + \beta_{8i}\ LnORIOWNER^3_i + \varepsilon_i$ (**Model 1**); $IUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnCONOWNER_i + \beta_{7i}\ LnCONOWNER^2_i + \beta_{8i}\ LnCONOWNER^3_i + \varepsilon_i$ (**Model 2**); $IUi == \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnORIOWNER_i + \beta_{8i}\ LnORIOWNER^2_i + \beta_{9i}\ LnORIOWNER^3_i + \varepsilon_i$ (**Model 3**); $IUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnCONOWNER_i + \beta_{8i}\ LnCONOWNER^2_i + \beta_{9i}\ LnCONOWNER^3_i + \varepsilon_i$ (**Model 4**). The total study sample is composed of 32 IPO firm listed in the TSE over the period March 1992-March 2006. The t-statistics are reported in parentheses; ** and * denote statistical significance at 5 and 10 percent level, respectively. Adjusted R^2 values are indicated.

Panel A – Nonlinear regression explaining the underpricing according to IU

	Ownership Variables					Control Variables					
	Constant	LnORIOWNER	LnORIOWNER^2	LnORIOWNER^3	LnTOPOWNER	SIZE	AGE	LEV	REP-A	REP-UW	R^2
Model (1)	55.970	-2.645	9.472	-9.771		13.168	-0.972	-0.640	21.471	-20.11	0.4681
	(2.59)**	(-1.05)	(0.89)	(-0.90)		(2.45)**	(-2.42)**	(-2.72)**	(1.58)	(-1.74)*	
Model (3)	47.897	-2.400	8.749	-9.181	0.126	13.580	-0.981	-0.629	21.428	-20.504	0.4693
	(1.12)	(-0.86)	(0.77)	(-0.80)	(0.22)	(2.34)**	(-2.37)**	(-2.56)**	(1.54)	(-1.65)*	

	Constant	LnCONOWNER	LnCONOWNER^2	LnCONOWNER^3	LnTOPOWNER	SIZE	AGE	LEV	REP-A	REP-UW	R^2
Model (2)	59.660	-1.896	3.955	-2.435		10.020	-0.802	-0.578	17.143	-24.331	0.4454
	(2.71)**	(-0.64)	(0.28)	(-0.15)		(1.94)*	(-2.04)*	(-2.43)**	(1.22)	(-1.80)*	
Model (4)	51.050	-1.601	2.929	-1.44	0.138	10.451	-0.813	-0.567	17.180	-24.653	0.4469
	(1.22)	(-0.49)	(0.20)	(-0.08)	(0.24)	(1.88)*	(-2.01)*	(-2.30)**	(1.20)	(-1.79)*	

▪ **Panel B –** This panel presents the results of the following regression models: $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnORIOWNER_i + \beta_{7i}\ LnORIOWNER^2_i + \beta_{8i}\ LnORIOWNER^3_i + \varepsilon_i$ (**Model 1**); $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnCONOWNER_i + \beta_{7i}\ LnCONOWNER^2_i + \beta_{8i}\ LnCONOWNER^3_i + \varepsilon_i$ (**Model 2**); $MAIUi == \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnORIOWNER_i + \beta_{8i}\ LnORIOWNER^2_i + \beta_{9i}\ LnORIOWNER^3_i + \varepsilon_i$ (**Model 3**); $MAIUi = \beta_{0i} + \beta_{1i}\ SIZE_i + \beta_{2i}\ AGE_i + \beta_{3i}\ LEV_i + \beta_{4i}\ REP\text{-}A_i + \beta_{5i}\ REP\text{-}UW_i + \beta_{6i}\ LnTOPOWNER_i + \beta_{7i}\ LnCONOWNER_i + \beta_{8i}\ LnCONOWNER^2_i + \beta_{9i}\ LnCONOWNER^3_i + \varepsilon_i$ (**Model 4**). The total study sample is composed of 32 IPO firm listed in the TSE over the period March 1992-March 2006. The t-statistics are reported in parentheses; ** and * denote statistical significance at 5 and 10 percent level, respectively. Adjusted R^2 values are indicated.

Panel B - Nonlinear regression explaining the underpricing according to MAIU

	Ownership Variables					Control Variables					
	Constant	LnORIOWNER	LnORIOWNER^2	LnORIOWNER^3	LnTOPOWNER	SIZE	AGE	LEV	REP-A	REP-UW	R^2
Model (1)	54.490	-2.984	11.246	-11.658		12.980	-0.935	-0.609	19.100	-21.683	0.4534
	(2.51)**	(-1.18)	(1.05)	(-1.07)		(2.40)**	(-2.31)**	(-2.58)**	(1.40)	(-2.01)**	
Model (3)	44.409	-2.677	10.343	-10.921	0.158	13.495	-0.946	-0.596	19.047	-21.912	0.4552
	(1.03)	(-0.95)	(0.91)	(-0.95)	(0.27)	(2.31)**	(-2.28)	(-2.42)**	(1.36)	(-1.97)**	
	Constant	**LnCONOWNER**	**LnCONOWNER^2**	**LnCONOWNER^3**	**LnTOPOWNER**	**SIZE**	**AGE**	**LEV**	**REP-A**	**REP-UW**	**R^2**
Model (2)	57.558	-2.584	7.852	-7.269		9.869	-0.742	-0.531	15.013	-17.51	0.4225
	(2.58)**	(-0.87)	(0.56)	(-0.43)		(1.89)*	(-1.87)*	(-2.21)**	(1.06)	(-1.74)*	
Model (4)	47.605	-2.243	6.665	-6.120	0.160	10.367	-0.754	-.519	15.056	-17.793	0.4245
	(1.12)	(-0.68)	(0.44)	(-0.34)	(0.28)	(1.85)*	(1.85)*	(-2.08)**	(1.04)	(-1.40)	

6. Conclusion

This study revealed interesting facts, but there still remain certain limits which would give themselves to further studies.

Summary of results

The underpricing of IPOs is a mysterious phenomenon in both theoretical and practical circles. Initial IPO underpricing of share transfer on the TSE is analyzed in this article. It transpires that, as in most stock markets, the market price of the shares of Tunisian listed companies significantly exceeds the offer price. More precisely, the Tunisian stock market, over the period 1992-2006, displayed an average IPO underpricing of about 19% and is very unstable. This is larger than that recorded in the developed countries. It is however lower than that recorded in the emerging stock markets such as China, Malaysia and South Korea. This relatively discount constitutes an implied cost supported by the original shareholders and leads to the fact that the Tunisian financial market suffers from evaluation problem.

The study of the possible relationship between the return of initial issues and the transfer of shares, enlightens us concerning the behavior adopted by both the original and the controlling shareholders. During a new listing, these shareholders are incited to reduce the underpricing in order to preserve their wealth. Thus, the entrenchment theory seems better adapted to the analysis of the phenomena of initial underpricing of Tunisian candidate companies. The result, however, seems sensitive to the choice of the measure of the underpricing.

Our results also reveal, as for most studies recorded in the financial IPO literature, that the majority of the variables describing the ex-ante uncertainty before issuance (size and age of the new listing, the underwriter reputation), makes the underpricing degree rise.

Study contributions

This study seems particularly interesting in Tunisia, where the economic tissue is made up of a family firms majority, heavily indebted and where almost all the introductions to the stock exchange are made by shares transfer by the original shareholders.

More precisely, this article presents an empirical contribution, as we believe it to be the first study concerned with urging original shareholders to underprice Tunisian candidate companies for listing in the stock market.

Works which have leaned in this direction of the study on IPO on the TSE (Tunisian Stock Exchange) were limited to descriptive statistics. This study is an attempt to define explanatory factors for the underpricing enigma on the Tunisian market. At the same time, this study allows us to compare our results with other studies carried out in both developed and emerging markets.

The robustness tests of were the most methodical part on the work.

This article is also of a practical interest in as far as the study of the performance of the candidate companies contributes to the analysis of the IPO process to decide if it is worth investing in initial public offering.

Limit and future fields of research

The narrowness of our study sample, although justified, imposes a restraining limit. Taking a larger sample, we could have improved our analysis and studied the distribution of initial issues according to the state of the stock market before issuance.

In conclusion, the study of the underpricing anomaly must be complemented by a study of long term performance. It might be profitable to invest in a newly listed company in the short term, whereas the long term stock exchange performance could well be disappointing.

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