

DETERMINANTS OF IPO UNDERPRICING: EVIDENCE FROM TUNISIA

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ABSTRACT

This paper empirically analyzes the short run performance of Tunisian initial public offerings (IPO). It sheds light on the determinants of IPO's in a context of a frontier market characterized by high information asymmetry, low information efficiency, thin trading and the presence of "noise" traders. Using a sample of 34 Tunisian IPO's from the period 1992-2008, we find an average market adjusted initial return for the first three trading days of about 17.8 percent. The factors significantly related to the underpricing are retained capital, underwriter's price support, oversubscription, listing delay and the offer price. Age of the firm, its size and the size of the offer do not seem to reduce the amount of money left on the table by issuers. It appears also that underpricing is driven by irrational investors (ipoers) seeking for short-run capital gains. These results remain unchanged after controlling for the presence of institutional investors, price discount and the existence of liquidity contract. Overall, the results show that investors rely mainly on side information to value IPOs.

JEL: G14; G3

KEYWORDS: Initial public offerings, Short-run underpricing, Underwriter's price support.

INTRODUCTION

Several empirical studies documented the existence of the initial underpricing phenomenon for newly listed firms during the early days of trading across many countries and capital markets. Early studies examined the performance of IPOs on the US market. Ibbotson (1975) find an average abnormal return of 11.4%. Loughran and Ritter (1995) based on their survey of papers on the IPO underpricing report average initial returns of 10.0%. More recently, Purnanandam and Swaminathan (2004) find returns ranging from 14.0 to 50.0% depending on the matching criteria used. At the international level, most researchers have found mixed results compared to American findings. On the German market, Ljungqvist (1997) using a sample of 189 firms over the period 1970-1993 find an initial underpricing of about 10.9%. In France, Jacquillat and MacDonald (1974) and Dubois (1989) report an initial underpricing respectively about 4.2% and 19.0 percent.

In the context of emerging markets, several studies highlighted that Chinese IPO's enjoy the world's highest initial returns. Among others, Mok and Hui (1998), Tian (2003) Chan *et al.* (2004) and Larry *et al.* (2008) report underpricing ranging between 100-300%. These levels are much higher than the average level of 60% in other emerging markets (Jenkinson and Ljungqvist, 2001). For example, Yong and Isa (2003) report an average initial yield of 80.3% for Malaysian IPOs over the period 1980-1991. More recently, Agarwal *et al.* (2008) find an average initial return of 20.8% for Hong Kong. Finally, Kiyamaz (2000) documents an average 13.6% underpricing over the period 1990-1995 for a sample of Turkish IPO's.

This paper extends the international literature on IPO's by examining the IPO's on the Tunis Stock Exchange (TSE), a frontier market characterized by high information asymmetry, low information efficiency, thin trading and the presence of "noise" traders. This study thus sheds light on the

determinants of IPO's in an insufficiently investigated context. In fact, a limited number of studies have examined IPO's underpricing on the context of frontier market. Particularly, on the TSE most of the conducted studies have highlighted the phenomenon without explaining it. For instance, Ben Naceur and Ghanem (2001) find an average underpricing of 27.8 percent for issues conducted over the period between 1990 and 1999. Gana and Ammari (2008) studied the incidence of shares transfers by the original shareholders on the degree of the initial underpricing. Using a sample of Tunisian candidates companies over the 1992-2006 periods, they find an initial underpricing of about 19.2%, which mainly depends on the original and controlling shareholders.

In this paper, we study the main determinants of initial IPO's performance based on a sample of 34 IPO's listed on the Tunisian Stock Exchange (TSE) over the period 1992-2008. We find an average initial return of about 16.0, 16.8 and 17.8% respectively for the first, second and third day of trading. The retained capital, underwriter's price support, oversubscription, listing delay and the offer price are the factors related to the underpricing. Age of the firm, its size and the size of the offer do not seem to reduce the amount of money left on the table by issuers. The results of the regression remain unchanged after controlling for the presence of institutional investors, the level of price discount and the existence of liquidity contract.

The remainder of the paper is organized as follows. Section 2 briefly discusses the relevant literature. Section 3 provides a brief description of Tunisian equity market. In section 4, we describe data selection, research method and empirical models. Section 5 presents the analysis and interpretations of the empirical results and Section 6 concludes the paper.

LITERATURE REVIEW

A number of theories and explanations of IPO underpricing have been put forward and tested against the data of various stock markets. However, no single theory can explain the initial performance of newly listed firms during the first days of trading (Jenkinson and Ljungqvist, 2001; Ritter and Welch, 2002).

Some models exploit the information asymmetry hypotheses. In this case underpricing is used as a mean to reduce the informational gap between different parties involved in the IPO process (Rock, 1986; Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989 and Welch 1989). They base their explanation on the Winner's Curse Hypothesis; that is underpricing intends to reward the informed investors for revealing private information. Other models based on the "ex ante uncertainty" hypothesis suggest that the uncertainty surrounding the IPO outcomes around listing can induce an IPO's underpricing (Beatty and Ritter, 1986; Carter and Manaster, 1990 and Megginson and Weiss, 1991). According to Beatty and Ritter (1986), underwriters possess a certification role, which reduces uncertainty in the IPO. Carter and Manaster (1990) find that prestigious underwriters underpriced less because they issue firms with lower ex ante uncertainty.

Finally, signalling models suggest that good firms use the underpricing to signal their quality to raise funds in the future with more favourable conditions through seasoned equity offerings (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989 and Brennan and Franks, 1997). In fact, only good firms can withstand a significant initial loss because they rely on a return on their investment.

To study the determinants of short-run underpricing in the TSE, we examine various explanations proposed by previous research. The variables examined include the retained capital, underwriter price support, oversubscription rate, listing time, offer price, age of the issuing firm, size of the issuing firms and size of the issue.

Retained capital: Many authors (Downes and Heinkel, 1982; Allen and Faulhaber, 1989) have highlighted the association between the level of the capital retained by insiders and the firm value. From an agency theory view, a high level of retained capital serves to align the interest of firm owners (managers) with those of new shareholders. This will lead to a higher value of the firm (Jensen and Meckling, 1976). Furthermore, firms with a diffuse capital structure observe more earnings management than more concentrated firms, which reduces the cash flows and consequently the firm value (Ritter, 1984).

On the other hand, the more the owners/executives are confident on the future perspectives of the IPO firm the more they will retain a high proportion of capital. Thus, the level of retained capital by existing owners will send a signal to the potential investors about the true value of the firm. This will contribute to lower the underpricing, as the company is able to set higher price for the offer (Mroczkowski and Tanewski, 2004). Conversely, high levels of retained capital may be associated with higher risks of cash flow minority rights expropriation (Bozzolan and Ipino, 2007). In such circumstances, potential investors will buy shares only when they are severely underpriced.

Underwriter price support: Early studies document a negative relation between underwriter reputation and initial underperformance of IPO (Beatty and Ritter, 1986; Johnson and Miller, 1988). Works that are more recent also confirm this view (Booth and Chua, 1996; Johnson and Miller, 1988; Kim and Ritter, 1999; Chang and al, 2008). This reflects that prestigious underwriters will reduce agency costs experienced by firms around IPO. On the other hand, firms with favourable information tend to choose high quality underwriters to signal the quality of the new issue (Titman and Trueman, 1986). Others attribute this negative relation to the certification role played by reputable underwriters. In fact, they contribute to reduce information asymmetry between owners and potential investors.

However, underwriter's reputation might be associated with high level of underpricing. In fact, underwriters are likely to care more about the perceived reputation among potential investors with whom they may maintain ongoing relations. Especially with "speculative investors", which seek to realize quick and short-term benefits (Spiess and Pettway; 1997). On the other hand, as noted by Loughran and Ritter (2002), reputable underwriters, which face increased financial analyst coverage of IPO's, are obliged to severely underprice.

In this study, we do not test the impact of reputation because of the lack of information and to the relative short experience of most of underwriters, which prevented us from adequately assess their prestige. However, in the TSE evidence of price support by underwriters are widely reported by both professionals and investors. As noted by several authors, underwriters may be motivated to support share prices after the firm going public to preserve their own reputation. They thus have incentives to support IPO's with low performance (less than the average) after listing (Schultz and Zaman, 1994). Empirically, evidence of price support is documented by Ruud (1993), Hanley (1993) and Schultz and Zaman (1994) on the NYSE and by Xu and Wu (2002) on the Shanghai Stock Exchange.

Oversubscription rate: Theoretically, the demand for the IPO, proxied by the oversubscription ratio, positively affects the level of underpricing. Michaely and Shaw (1994) argue that underpricing depends on the information heterogeneity among investors. Based on the Rock's 'winner curse' model (1986), they show that the decrease of information homogeneity induces higher underpricing. They assume that the level of heterogeneity increases with the demand for the firm's shares, as both informed and uninformed will bid in "good" IPO's, whereas "bad issues" attract only uninformed investors. Alternatively, Chowdhry and Sherman (1996) argue that potentially highly underpriced IPO's may attract more investors looking for high potential capital gains. They explain that when the disclosure of the price is before the end of biddings, it is likely that a substantial information leakage take place. This leads to an increase in the demand for the firm's shares, particularly when investors realize that the offer price is low.

Empirically, several authors used the oversubscription rate to explain the magnitude of abnormal returns of IPO's observant during the first listing day (Allen and Faulhaber, 1989; Chowdhry and Sherman, 1994; Booth and Chua, 1996). Hanley (1993) find a positive relation between the subscription ratio and the size of the initial performance on a sample of American IPO's. Kandel *et al.* (1999) find similar results on the Tel Aviv Stock Market. Agarwal *et al.* (2008) analyze a sample of IPO's on the Hong Kong Stock Market and find a positive relation on the short run but a negative association on a longer horizon. They explain these results by investor's overreaction on the short run.

Listing time: According to Chowdhry and Sherman (1996), the listing delay (the period separating the closing of the offer and the first trading day) is associated with the underpricing level. On one hand, longer time of listing is associated with more uncertainty on the offer. On the other hand, before listing, there are no share price signals. Thus, to compensate investors for the high level of illiquidity firms apply a share-pricing discounts. When, the listing of a firm takes too long, the market may revise its expectations about the future value of the firm and hence affect the subsequent level of underpricing. Mok and Hui (1998) and Su and Fleischer (1999) find a positive relation between average initial returns of IPO's and the listing time for the Shanghai Stock Exchange. Megginson and Tian (2006) find that one day's delay of the flotation increases the initial returns by 0.4 percent in China. They attribute this to the unusual long delays of listings in China (over 10 months).

Referring to the specific case of the Tunisian Stock Exchange, the relation between listing delay and underpricing is more likely to be unintended, as there is no ex post information about how long the listing of an IPO will take. This long delay between the closing of the offer and the listing is mainly due to the type of offerings (direct registration, minimum price, firm price, open price) and to regulatory clearances and controls. In such circumstances, investors are discouraged to trade actively in the market as the delay of listing gets longer. This will reduce their irrationality and hence the aftermarket performance of the IPO. Uddin (2008) first highlights this argument. He advocates that to the extent that the issuers do not know the listing delay, it seems hard to believe that they will intentionally lower the offer price. A part of the underperformance is thus unintended by the issuer.

Offer price: The initial price of an IPO offering may also indicate the extent of underpricing, although its level has little economic significance (Fernando *et al.*, 1999). Firms do not set the offer price in an arbitrary way. In fact, when the aim of the IPO is to encourage retail investors to participate to the subscription, the issuers set a relatively low price to encourage potential small investors. This will systematically lead to an excessive demand for the security and hence to larger underpricing. Besides, Daily *et al.* (2003) suggest that higher offer prices are associated with lower uncertainty regarding the future performance of the firm.

Conversely, firms looking to attract institutional investors tend to set high offer prices. In fact, institutional are known to avoid low price shares (Gompers and Metrick, 1998). This presence of institutionals might lead to higher underpricing, given the necessary compensation for the valuable information they provide and their contribution to a better marketing of the IPO (Benveniste and Spindt, 1989). Furthermore, Jain and Kini (1999) argue that a low offer price may indicate little demand, low value or both and hence are associated with lower short-term performance.

Empirical evidence provides mitigated results regarding the relation between the offer price and underpricing. Ibbotson *et al.* (1988) find that firms offered with very low prices usually record high levels of underpricing. They argue that low priced-offers present higher risks and are subject to speculative trading. Fernando *et al.* (1999) report a U-shaped association.

Age of the issuing firm: Age of the firm is hypothesized to have a negative impact on the level of underpricing following the IPO (Carter *et al.* 1998; Ritter, 1984, 1991, and Megginson and Weiss, 1991).

First, newly created firms, as opposed to old ones, exhibit higher ex-ante uncertainty. Since, less-seasoned firms are less likely to have been followed by financial analysts (and so well assessed) as they do not have enough historical published financial data. Second, the availability of information on firms operating for several years contributes to reduce the information asymmetry around the IPO (Ritter, 1984 and 1991; Hensler *et al.*, 1997). This uncertainty about the future perspectives of the candidate company induces a higher underpricing (Bilson *et al.*, 2003).

Size of the issuing firms: Several studies have reported a negative link between firm size and short run underpricing (Megginson and Weiss, 1991, Ibbotson *et al.*, 1994; Carter *et al.*, 1998). Larger firms with more diversified products lines and monitoring proceedings, have better access to investment capital and resources, which are crucial for their profitability and survival (Finkle, 1998). Indeed, the size of the firm is usually negatively associated to its risk. These factors contribute to reduce the uncertainty around the IPO of large firms for potential investors (Kiymaz, 2000; Bhabra and Pettway, 2003). However, other studies (Titman and Wessels, 1988; Schultz, 1993) support the inverse relation between risk and firm size.

Size of the issue: The size of the IPO offer, measured by the total gross proceeds raised from the market, is expected to affect negatively the underpricing level. According to Miller and Reilly (1987) and Clarkson and Simunic (1994), the size of the offering indicates the uncertainty about IPO firms. Well-known firms with running years and better records usually offer larger IPO's. This contributes to reduce the perceived risk of the IPO from the side of potential investors (Carter *et al.*, 1998; Jain and Kini, 2000). Carter and Manaster (1990) document that, besides the uncertainty surrounding the IPO, investors will take into account its size to assess IPO performance. Empirically, several studies report evidence for this negative relation between the amount of raised funds and the level underpricing (Ritter, 1987, Jog and Riding, 1987, Chalk and Peavy, 1990 and Clarkson and Merkle, 1994).

THE IPO MARKET IN TUNISIA

The Tunis Stock Exchange (TSE) was established in 1969. During the first three decades, the Tunis stock market has not played a significant role in funding private companies. Since then, Tunisian authorities has undertaken several reforms mainly during the 1990s aimed at developing the market financing of the economy. The current electronic trading system used by the TSE was established in 1996 (AtosEuronext upgraded to a new version in 2007). All listed securities are traded on the system. The most liquid shares are traded continuously and the less liquid are traded in fixing mode.

Listing on the main market requires a company to float freely at least 10% of its outstanding shares to the public with a minimum of 200 shareholders. The listed firm must have at least two years of profit and one dividend paid. Three recognised methods for IPO's in Tunisia. We find the ordinary procedure for listing of already existing shares and offers for sale and beading procedure for new public issues.

The approval process is lengthy. First, candidate firms agree on the price of the issue with the underwriter. Then, an application for approval is submitted to the Tunisian Financial Market Council (FMC). The FMC evaluates the company, examines its forecast profits and the quality of its internal controls and its information disclosure. Once the FMC have approved the application, the issuer, the underwriter and an independent auditor fill in a prospectus. The prospectus must include detailed financial accounting information about the firm, along with details on the company's operating history, management team, prospects, risks, its controlling shareholders and its subsidiaries. The underwriter (pricer) sets the final share issue price and announces it to the public.

In Tunisia, a quotas procedure is used to allocate IPO shares. Issuing firms and underwriters distribute shares randomly and equally across application orders collected in the subscription period. However, in

recent years shares are often classified into different categories: institutional investors, foreign investors and local subscribers. Each category is allocated a pre-specified percentage of the issued shares to ensure a better diffusion of the shares among various categories of shareholders and hence to reduce underpricing and speculation.

As in most emerging markets, the TSE has imposed ceilings since 1994. The purpose of this rule is to protect the stock market and investors from speculative threats often observed in emerging markets. It aimed also at avoiding price irregularities and volatility. All the stocks have undergone these regulatory limits from their first day of trading. The listed stock prices can fluctuate between ± 3.0%. When a stock price reaches the ceiling, the share trading is suspended until the stock price falls below the maximum fluctuation rate, or rises above the minimum rate of change during the same day. However, we have noted varying levels of the margins of fluctuations in the TSE over the period of study, particularly during the first days of trading. Sometimes the supervisory board has removed the ceilings during the first three days of new firm listing. In other circumstances, the fluctuation margins were increased to ± 18.0%. These changes aimed at allowing the market to evaluate freely the price of the newly introduced shares.

Table 1 Number of Listed Companies 1990-2008

	1990	1995	1999	2002	2003	2004	2005	2006	2007	2008
Number of listed companies	13	26	44	46	45	44	45	48	51	52
Capitalisation in million dinars	448	3967	3326	2842	2976	3085	3840	5491	6527	6063

This Table exhibits the number and the market capitalisation of listed companies in Tunisia from 1990 to 2008. Over the period 1990-2006, the Tunisian Dinar (TND) has ranged from 1 USD to 0.8 USD.

Source: TSE and BVMT annual reports

Table 1 shows that the number of listed firms increased from 13 firms (mostly from the financial sector) in 1990 to 52 firms in 2008. Following the privatization program launched by the Tunisian government during the 1990s, going public was used as a mean for the privatization of state owned enterprises. The number of IPOs varied sharply across the period 1992-2008 (Figure 1). The year 1999 recorded the highest number of listings, with six newly public offerings. This coincided with the privatization of four state owned companies following the commitment of the Tunisian government to move toward a market-based economy. The years 2000, 2003 and 2004, with no IPOs, exhibited the lowest figures. For the year 2000, this may be due to the large number of IPO's conducted in 1999. However, for the years 2003 and 2004 we attribute this absence to unfavorable market conditions (crisis of confidence and of liquidity).

Figure 1: Number of Listing by Year (1992—2008)



METHODOLOGY

Data

The sample consists of 34 new listings of ordinary shares on the Tunisian stock exchange from January 1992 to December 2008. We considered only IPOs motivated by opening capital decisions and we excluded IPO's with no selling of shares. Post-IPO performance data on the closing prices and the market Index are collected from the TSE online database (www.bvmt.com.tn). Only one firm, a retail company, was delisted because their bankruptcy in 2002. This does not alter our analysis given that the first listing of this company was in 1997, five years before delisting. We collected data used to explain short run underpricing from two sources: the FMC and the TSE. We obtained information on IPO firm characteristics around the listing period and on the operation of introduction itself from hard copies of prospectus published by the issuers (available at the FMC documentary service and from the *Bulletin Official* of the TSE).

Research Design

To analyze the relation between initial returns of IPOs and their determinants, we use a two-steps approach. First, we measure the short run underpricing and then, we investigate the factors affecting the initial returns. Consistent with previous studies (Aggarwal *et al.*, 1993; Chi and Padget, 2005), we use the following methodology to measure the underpricing of IPO's. We calculated the return of stock i at the end of the first trading day as following:

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

Where P_{i1} is the closing price of the stock i on the first trading day, and S_{i0} is the subscription price and R_{i0} is the raw first-day return on the stock price. As the issue price of the share is fixed at the prospectus publication date, the return between the price at the end of the first day of trading and the issue price will depend, in part, on changes in market conditions facing companies. To account for the impact of the substantial delay between pricing and listing, we use the market-adjusted abnormal return for each IPO on the first trading day computed as:

$$MAR_{m1} = R_{i1} - R_{m1} \quad (2)$$

The return on the market index for the same day is given by:

$$R_{m1} = \frac{P_{m1}}{P_{m0}} - 1 \quad (3)$$

Where P_{m1} is the closing market index value on the first trading day, P_{m0} is the closing market index value on the last day of the subscription period of the IPO, and R_{m0} is the first day's comparable market return. In this study, we use the TUNIDEX index (the market capitalization weighted index for the TSE) as a proxy for the market index. As expressed in (2), the market adjusted abnormal return MAR_{m1} supposes that the systematic risk of the IPO's is equal to one. A number of studies (Ibbotson, 1975; Spiess and Affleck-Graves, 1995) demonstrate that the average beta of newly listed firms is higher than the systematic risk of the market portfolio. Thus, this measure of the abnormal return provides a somehow upwardly biased estimate of the initial performance of the IPO relative to the market.

To account for the ceiling imposed on trading at the TSE, several short-run returns are computed to capture the effective underpricing MAR_{mt} ($t= 2, 3$) in an analogous manner to MAR_{m1} . We calculate also the underpricing for the days four to 10 after listing. We note that beyond the 3rd day of listing, underpricing remains relatively flat and stable. Hence, in the remaining of this work, we limit the analysis to the first three days after listing. As noted by Ljungqvist *et al.* (2006), it is appropriate to measure the underpricing over a longer window in less developed markets where aftermarket prices may take more time to reach equilibrium. To explore the determinants of IPO underpricing, we use multiple linear regression models. In Table 2, we summarized all explanatory variables used in our study.

Table 2: List of Explanatory Variables

Variables	Proxies	Measure	Expected sign
Retained Capital	Capret	1-percentage of shares raised to total outstanding shares	+/-
Underwriter’s price support	UndPS	Dummy variable, it takes one if the underwriter supports its own IPO and 0 otherwise.	+/-
Oversubscription ratio	Over	The number of demanded shares over the number of shares offered	+
Listing delay	Del	The number of days separating the closing of subscriptions and the first day of trading	+
Offer price	Price	The natural logarithm of the price set by the issuer	-
Firm age	Age	The natural logarithm of the number of years between the year of creation and the IPO	-
Firm size	FSize	The natural logarithm of total assets at the end of the year preceding the IPO of the issuing firm	-
Offer size	OSize	The natural logarithm of the number of offered shares * offer price	-

The regression model retained is as follow:

$$MAR_{mt} = \beta_0 + \beta_1 Capret + \beta_2 UndPS + \beta_3 Over + \beta_4 LDel + \beta_5 LPrice + \beta_6 LAge + \beta_7 FSize + \beta_8 OSize + Control\ Variables + \varepsilon \tag{4}$$

Where MAR_{mt} is the degree of short run underpricing for $t=1, 2$ and 3 (market adjusted initial returns of IPO of the three first days). Capret is the percentage of retained capital. UndPS, a dummy variable which takes one if the underwriter supports its own IPO and zero otherwise. Over is the oversubscription ratio measured by the number of demanded shares over the number of offered shares. LDel is the listing time calculated as the natural logarithm of the number of days separating the closing of subscriptions and the first day of trading. LPrice calculated as the natural logarithm of the offer price by the issuer. LAge is the issuing firm age, measured as the natural logarithm of the number of years between the year of creation and the IPO. FSize is the firm issuing size measured by the natural logarithm of total assets of the issuing firm at the end of the year preceding the IPO. OSize represents the funds raised measured by the natural logarithm of the number of offered shares multiplied by the offer price.

We introduce three control variables. Cliq is a dummy variable taking one if there is a liquidity contract in the IPO and zero otherwise. Inst is a dummy variable taking one if a part of the IPO is reserved to institutional investors and zero otherwise. Finally, Disprice is the level of price discount set by the issuer based on the mean of the firm value obtained using several methods of valuation.

EMPIRICAL RESULTS

Characteristics of Short Run Underpricing

Table 3 reports summary descriptive statistics of underpricing for the 34 IPO's conducted during the period 1992-2008. The degree of underpricing ranges from -4.4% to +65.0%. The average initial return amounted 16.0%, 16.8% and 17.8% for the first, the second and the third trading day, respectively. This underpricing is significantly different from zero at the 1% level for all cases. The percentiles exhibit the same patterns for MAR1, MAR2 and MAR3, confirming the significance of the underpricing. On the other hand, the median in all cases is lower than the mean, which indicates the skewness of the initial returns series is at the right. Our results are closed to Gana and Ammari (2008), who reported initial underpricing of about 19.2% for the sample of Tunisian IPOs listed from 1992 to 2006. Yet, these results contrast with those found by earlier studies examining short run underpricing of IPO's of the TSE. For instance, Ben Naceur and Ghanem (2001) reported a short run underpricing of 27.8% over a longer period from 1990 to 1999.

Table 3: Descriptive Statistics of MAR of the 1st, 2nd and 3d Day (1992-2008)

	Min	Max	Mean	Median	SD
MAR 1	-0.044	0.640	0.160	0.108	0.172
MAR 2	-0.048	0.607	0.168	0.110	0.168
MAR 3	-0.033	0.650	0.178	0.113	0.181
Percentiles	10%	25%	50%	75%	90%
MAR 1	0.0024	0.0296	0.1087	0.2484	0.3909
MAR 2	0.0024	0.0297	0.1087	0.2484	0.3909
MAR 3	0.0048	0.0439	0.1137	0.2819	0.5012

This table reports summary descriptive statistics (minimum, maximum, mean, median, standard deviation and percentiles) of the market adjusted abnormal return (MAR) of the first, second and third day for each year, respectively.

Table 4 shows that the IPO's of the year 2005 displays the highest underpricing (32.2%) while we have recorded the lowest figure in 1993 (0.2%). The analysis of these results suggests the existence of two sub-periods. The first one includes the years 1992-1998 and 2002, which exhibit low levels of underpricing. For the 1992-1998 period, we can attribute this weak underpricing to the fact that the stock market was not well developed and juvenile. While, the impact of the year 2001 (due especially to geopolitical tensions) can explain the poor short-term performance of IPO's in 2002. The second sub-period includes the years 1999, 2001 and the period 2005-2008 with higher levels of underpricing. We attribute this to the outstanding performance of the Tunisian economy and to the growing interest of international investors to the TSE since 2005.

We also compare the frequencies of the firms exhibiting underperformance (positive abnormal returns) and those with negative abnormal returns. It appears that for the first day of trading, 91.2% of the 34 issuing firms were underpriced. For the second and the third day, only 5.9% recorded negative returns.

Descriptive Statistics of Independent Variables

Table 5 reports the characteristics of the main variables used in this study. The retained capital for the 34 offered shares averages 76.1%, with a minimum of 51.0% and a maximum of 90.0%. Oversubscription averages 4.5 for our sample, with a minimum of 0.6 and a maximum of 18.6. These levels are comparable to oversubscription rates observed in other developed and emerging markets. In our sample of 34 IPO's, the listing of a firm takes in average 18 days. However, the listing delay varies across IPO's ranging from a minimum of four days to a maximum of 56 days.

Table 4: Summary of MAR Characteristics by Introduction Year

Year	MAR 1	MAR 2	MAR 3
1992	0.054	0.082	0.109
1993	0.002	0.004	0.006
1994	0.030	0.049	0.078
1995	0.029	0.047	0.056
1996	0.009	0.009	0.008
1997	0.041	0.043	0.047
1998	0.084	0.103	0.11
1999	0.239	0.2411	0.268
2000	-	-	-
2001	0.227	0.261	0.312
2002	0.038	0.036	0.041
2003	-	-	-
2004	-	-	-
2005	0.322	0.300	0.291
2006	0.196	0.194	0.165
2007	0.305	0.291	0.305
2008	0.197	0.231	0.197
Total	0.1607	0.1683	0.1783

This table shows average short-run underpricing (MAR) by introduction year. The level of MAR is reported over the first three days of listing. Source: authors' calculations.

The average price for Tunisian IPO's is 15.75 dinars, the minimum offer price is 2.55 dinars and the highest price was set to 43 dinars. Professionals consider a price less than five dinars as a low price, whereas they consider a share offered above 20 dinars as a high price. The average and the median age of firms, which conducted IPO's in the TSE, are about 22 years. The minimum number of years of operation is one year and the maximum is 67 years. It seems also that in recent years, the IPO market attracted well-established firms with long experience and mature organisations. The average total assets is 27.9 million dinars, with a minimum of 0.98 and a maximum of 80.9. Medium size companies dominate our sample (half of IPO firms with less than 30 million dinars of total assets). The total funds raised by firms listed in the TSE averaged 8.7 million dinars. The minimum gross proceeds amounted 0.75 and the highest capital raised 43.6 millions. This relatively small amount of funds raised, compared to other international emerging markets, is explained first by the low capitalisation level of IPO candidate companies. Second, Tunisian companies are historically bank oriented and they are not enthusiastic about raising funds from the market. However, during the last years gross proceeds from IPO's reached higher levels with more than 43 million dinars raised from the market for each of the two IPO's conducted during the year 2008.

Table 5: Summary of IPO Sample Characteristics

	Mean	Median	Min.	Max.	S.D.
Capret	0,76	0,73	0,51	0,90	0,10
Over	4,52	3,50	0,61	18,61	4,30
LDel	18,38	17,00	4,00	56,00	10,51
LPrice	15,75	15,00	2,55	43,00	8,95
LAge	21,94	21,50	1,00	67,00	15,58
FSize*	65 ,3	27,9	0,98	80,9	141,2
OSize*	8,7	5,5	0,75	43,6	10,2

Table 5 reports the main descriptive statistics of the variables used as determinants of short run underpricing in Tunisia. Capret is the retained capital. Over is the oversubscription ratio, measured by the number of demanded shares over the number of offered shares. LDel, the listing time calculated as the natural logarithm of number of days separating the closing of subscriptions and the first day of trading. LPrice calculated as the natural logarithm of the offer price by the issuer. LAge is the issuing firm age, we measured it as the natural logarithm of the number of years between the year of creation and the IPO. FSize is the firm issuing size measured by the total assets at the end of the year preceding the IPO of the issuing firm. OSize is the funds raised measured by the number of offered shares x offer price.

** In millions of dinars (approximately 1 TND = 0.85 D)*

In Table 6, we present the correlation matrix of the variables used. Parametric and nonparametric correlation matrix show no correlation between the different explanatory variables.

Table 6: Parametric and Non Parametric Correlation Matrix

	Capret	Over	lDel	lPrice	lAge	FSize	OSize
Capret	1.00	0.20	-0.01	-0.06	-0.19	0.21	-0.09
Over	0.22	1.00	0.10	-0.23	0.16	0.27	0.26
lDel	-0.09	0.21	1.00	0.23	0.06	-0.15	0.09
lPrice	-0.05	-0.37*	0.33	1.00	0.18	-0.17	-0.09
lAge	-0.08	-0.02	0.04	0.20	1.00	0.06	0.31*
FSize	0.24	-0.01	-0.26	-0.06	-0.08	1.00	0.23
OSize	-0.12	0.10	0.03	-0.03	0.28	0.27	1.00

Table 6 shows the parametric test of Pearson (lower part) and nonparametric test of Spearman (upper part) correlation between different explanatory variables used in the study. Capret is the retained capital. Over is the oversubscription ratio, measured by the number of demanded shares over the number of offered shares. lDel the listing time calculated as the natural logarithm of number of days separating the closing of subscriptions and the first day of trading. lPrice calculated as the natural logarithm of the offer price by the issuer. lAge is the issuing firm age, we measured it as the natural logarithm of the number of years between the year of creation and the IPO. FSize is the firm issuing size measured by the total assets at the end of the year preceding the IPO of the issuing firm. OSize is the funds raised measured by the number of offered shares x offer price. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Findings and Discussion

We regress the initial returns measures on all explanatory variables supposed to influence the IPO underpricing. The regression models use the market adjusted returns for the three first days of trading (MAR_{mt}) of all 34 IPO's. Table 7 presents the results of coefficient estimates. As noted above, we consider only the first three days of trading as the underpricing remains relatively flat and stable beyond the third trading day. For the different MARs the estimated coefficient are comparable in size, magnitude and significance. We therefore focus in the remainder of the paper only on MAR3.

Table 7: Determinants of Short-run Underpricing

	(1) MAR1	(2) MAR2	(3) MAR3
Capret	-0.393	(0.0169)**	-0.371 (0.0196)**
UndPS	0.223	(0.0001)***	0.218 (0.0001)***
Over	0.004	(0.1859)	0.007 (0.0367)**
lDel	0.102	(0.0062)***	0.095 (0.0126)**
lPrice	-0.086	(0.0138)**	-0.075 (0.0300)**
lAge	-0.021	(0.4222)	-0.029 (0.2562)
FSize	-0.006	(0.6240)	-0.009 (0.4623)
OSize	-0.011	(0.5068)	-0.008 (0.6407)
cons	0.671	(0.0814)	0.659 (0.0834)
N	34	34	34
R ²	0.7050	0.7074	0.6760

Table 7 presents regression results of our model. MAR_{mt} is market adjusted initial returns of IPO for $t=1, 2$ and 3 . It measures the degree of short run underpricing over the three first days. Capret is the retained capital. UndPS, dummy variable, it takes one if the underwriter supports its own IPO and zero otherwise. Over is the oversubscription ratio, we measured it by the number of demanded shares over the number of offered shares. lDel is the listing time calculated as the natural logarithm of number of days separating the closing of subscriptions and the first day of trading. lPrice calculated as the natural logarithm of the offer price by the issuer. lAge is the issuing firm age, we measured it as the natural logarithm of the number of years between the year of creation and the IPO. FSize is the firm issuing size measured by the total assets at the end of the year preceding the IPO of the issuing firm. OSize is the funds raised measured by the number of offered shares x offer price. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

The regression results show that retained capital (Capret), underwriter price support (UndPS), listing delay (lDel) and offer price (lPrice) are statistically significant and have the expected signs. The estimated coefficient for the variable oversubscription rate is positive and statistically significant. The other explanatory variables (firm age, firm size and the size of the issue) do not seem to have any impact on the level of underpricing.

Underpricing is negatively correlated with the share of capital held by the controlling shareholders (Capret). This result is consistent with both the “agency costs” and the “signalling hypothesis”. However, we privilege the signalling hypothesis channel. In fact, both a high level of informational asymmetry and a lack of transparency characterize the Tunisian exchange market. In such circumstances investors lean mainly on side signals to assess the true value of the firm. Retaining capital by original owners is thus a strong indicator of the future perspectives of the IPO firms. On the other hand, investors often consider the fact to diffuse a high proportion of capital among small minority shareholders as a mean to share risks (in the future) or to disengage progressively from the firm.

Our results show also a strong evidence for underwriters’ price support. The coefficient estimate of the variable (UndPS) is significantly positive at the 1% level. This result is consistent with the findings of Schultz and Zaman (1994) on the NYSE, Xu and Wu (2002) on the Shanghai stock exchange and Uddin (2008) on the Indian stock exchange. The result confirms the widespread view among professionals on the existence of price support practices on the TSE. We believe that some brokers use price support practices for mainly two reasons. First, their “reputation” on the market as leading successful IPO’s can motivate them to practice “price support.” Second, because of the thinness of the Tunisian exchange market, underwriters, which act also as brokers gain money from trading activities on the post-IPO market. They thus have incentives to support their own IPOs to maximize their potential profit from other investors trading.

The demand for the firm’s shares is positively related to the degree of underpricing. We believe that this positive coefficient estimate of the variable oversubscription indicates the expectations of potential investors on the future short-run performance of the IPO. We argue that the Tunisian market attracts investors that participate in the stock exchange only during IPO said to be “ipoers,” motivated only by short run profits. They exploit information leakage made by institutional investors or other “strategic investors” to subscribe to highly underpriced IPO’s.

The positive sign of listing delay (lDel) is consistent with the findings by Chowdhry and Sherman (1996) on the UK market and by Megginson and Tian (2006) on the Chinese market. However, we do not advance the same explanation. It is in fact hard to advocate that candidate firm is intently underpriced when listing delays get longer. We support the point of view, which states that underpricing is more likely to be unintended. In fact, listing delays lead to increased information leakage about the true value of the offered share. Rationed investors looking for short run profits, particularly “ipoers,” will thus try to catch up and will add to the buy side pressure on post-IPO trading. This might lead to an overreaction of share prices during the first days of listing.

Our findings show a negative relation between offer price (lPrice) and underpricing. This may be attributed either to higher demand for low price IPO’s or to the lower uncertainty surrounding IPO’S offered at high prices. We tend to support the first explanation as price and oversubscription rate are negatively and significantly correlated (-0.37). Besides, subscribers are more likely to be exposed to rationing when the offer price is low. This rationing will add to the pressure on the buy side in the post-IPO trading and will thus lead to an increase in the short run performance of offered shares.

The other explanatory variables included in the regression do not have any impact on the level of underpricing. This indicate that age, firm size and the offer size are not used by investors to assess the information asymmetry and thus to reduce ex ante uncertainty about the issuing firm. Differently put, we document that Tunisian investors rely mainly on side information (retained capital, underwriter, demand level and listing delay) rather than on companies characteristics disclosed on IPO’s prospectus. These findings are contradictory to other results on frontier markets. For instance, Gasbarro *et al.* (2003) find that information disclosed in the prospectus, such cash flow and sales, are positively related to the level of initial underpricing on a sample of Mauritius IPOs. We give two explanations to our result. On one hand,

we can attribute this to the presence of a high number of “ ipoers” who are only interested in short run performance of the share. On the other hand, Tunisian investors seem to be sceptical about the value of information disclosed on IPO’s prospectus. In fact, particularly in Tunisia, firms often proceed intensively to window dressing before going public.

Robustness Checks

To investigate the robustness of our results, we control the impact of three variables on underpricing : namely the participation of institutional investors in IPO’s, the level of price discount and the existence of liquidity contracts. Results are presented in Table 8. We note that the direction and significance of the coefficient estimates for the basic model remain unchanged. First, the existence of a liquidity contract is unrelated to the level of underpricing. This indicates that providing a protection against market illiquidity does not contribute to reduce ex ante uncertainty and hence to lower the amount of the money left on the table by issuing firms. Second, the presence of institutional investors does not act as a “certification” of the value of the company, which reduces uncertainty and therefore produces a lower level of underpricing. Our results are inconsistent with Ljungqvist *et al.* (2006). Finally, the level price discount set by issuing firms is not associated with the level of underpricing.

Table 8: Robustness Check

	(1)		(2)		(3)		(4)	
	MAR3		MAR3		MAR3		MAR3	
Capret	-0.412	(0.0185)**	-0.407	(0.0179)**	-0.418	(0.0396)**	-0.436	(0.0457)**
UndPS	0.211	(0.0004)***	0.203	(0.0010)***	0.205	(0.0013)***	0.210	(0.0006)***
Over	0.009	(0.0265)**	0.0095	(0.0267)**	0.008	(0.0547)*	0.0098	(0.0408)**
LDel	0.125	(0.0101)**	0.129	(0.0126)**	0.127	(0.0199)**	0.1233	(0.0166)**
LPrice	-0.091	(0.0150)**	-0.086	(0.0226)**	-0.082	(0.0265)**	-0.093	(0.0189)**
LAge	-0.038	(0.1848)	-0.031	(0.2226)	-0.029	(0.2526)	-0.036	(0.2014)
FSize	-0.009	(0.4906)	-0.011	(0.3892)	-0.011	(0.4136)	-0.008	(0.5275)
OSize	-0.020	(0.3219)	-0.015	(0.5161)	-0.024	(0.2807)	-0.023	(0.4127)
Cliq	-0.054	(0.1923)					-0.053	(0.3400)
Inst			-0.038	(0.4744)			-0.006	(0.9188)
Disprice					-0.022	(0.8644)	-0.053	(0.7149)
cons	0.917	(0.0397)	0.802	(0.0910)	0.94	(0.0791)	0.9731	(0.1123)
N	34		34		34		34	
R ²	0.6944		0.6828		0.6762		0.6959	

Table 8 reports results of four regression models including our three control variables (Cliq, Inst and Disprice). We added respectively Cliq, Inst, Disprice in the first, second and third equations. In the fourth equation, we introduced all our control variables. MAR₃ is the degree of short run underpricing for the third day. Capret is the retained capital. UndPS, dummy variable, it takes one if the underwriter supports its own IPO and zero otherwise. Over is the oversubscription ratio, we measured it by the number of demanded shares over the number of offered shares. LDel is the listing time calculated as the natural logarithm of number of days separating the closing of subscriptions and the first day of trading. LPrice calculated as the natural logarithm of the offer price by the issuer. LAge is the issuing firm age, we measured it as the natural logarithm of the number of years between the year of creation and the IPO. FSize is the firm issuing size measured by the total assets at the end of the year preceding the IPO of the issuing firm. OSize is the funds raised measured by the number of offered shares x offer price. Cliq is a dummy variable taking one if there is a liquidity contract in the IPO and 0 otherwise, Inst is a dummy variable taking one if a quota of IPO is reserved to institutional and 0 otherwise and Disprice is the price discount. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

To further investigate the extent of our results, we re-estimate our regressions taking into account the industry affiliation of the firm. Daily *et al.* (2005) and Lee *et al.* (2001) use industry type to distinguish between high- and low-technology firms. Clarckson and Merkle (1994) and Gajewski and Gresse (2006) account for the risk of the industry. They use a dummy variable to differentiate risky industries (with an average beta greater than 1) and less risky industries (with average betas less than 1).

In referring to Tunisian IPOs, it is not possible to test the impact of Hig-tech affiliation on underpricing. Among the 34 issuing firms, no one can be classified into such category. We thus consider two other specific dummy variables. The first variable (IND) takes one if the issuing firm operates in the manufacturing industry and 0 otherwise. These firms have more tangible assets and are easier to assess.

They hence display less ex ante uncertainty. The second variable (Finance) takes one for the IPOs made by financial institutions and 0 otherwise. Financial IPOs are expected to have less underpricing compared with other sectors. They are associated with lower uncertainty about future prospects of the company and to a greater transparency in accounting disclosure.

Our results (Table 9) do not exhibit significant difference between financial and non-financial IPOs with regard to their performance after listing. This result is consistent with the findings of Firth (1997). Table 9 indicates that IPO underpricing is less pronounced for firms belonging to the manufacturing sector than for firms operating in non-manufacturing activities. This gives evidence to the hypothesis of a better assessment of enterprises operating in conventional activities. Firms with low proportion of intangible investment to total assets exhibit lesser ex ante uncertainty.

Table 9: Determinants of Underpricing Including Sector Variables

	(1)		(2)	
	MAR3		MAR3	
Capret	-0.385	(0.0184)**	-0.360	(0.0426)**
UndPS	0.190	(0.0011)**	0.200	(0.0013)**
Over	0.006	(0.1503)	0.005	(0.2937)
LDel	0.122	(0.0331)**	0.135	(0.0108)**
LPrice	-0.092	(0.0150)**	-0.090	(0.0175)**
Ind	-0.069	(0.0994)**		
Finance			0.040	(0.5564)
cons	0.323	(0.0504)	0.227	(0.1305)
N	34		34	
R ²	0.6625		0.6332	

Table 9 presents more investigation on ex-ante uncertainty by introducing sector variables (Ind, Finance). MAR_3 is the short run underpricing of the third day. Capret is the retained capital. UndPS, dummy variable, it takes one if the underwriter supports its own IPO and zero otherwise. Over is the oversubscription ratio, we measured it by the number of demanded shares over the number of offered shares. LDel is the listing time calculated as the natural logarithm of number of days separating the closing of subscriptions and the first day of trading. LPrice calculated as the natural logarithm of the offer price by the issuer. Ind, is a dummy variable taking one if the IPO was in the Industrial Manufacturing (General Manufacturing, Steel, Metal, Chemical, Pharmaceutical) sector and zero otherwise, Finance, is a dummy variable taking one (1) if the IPO was in the financial sector (banking and insurance), otherwise is coded zero (0). *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

CONCLUSION

This paper attempts to analyze the short-run underpricing for a sample of 34 Tunisian IPO's for the period 1992-2008. While accounting for the presence of ceiling constraints, we captured the level underpricing over the first three days of trading. The initial return is about 17.8% for the third day. However, we highlighted varying level underpricing across the years. This underpricing is comparable to other international studies, but is different from those of other emerging markets such as the Chinese and Hong Kong markets.

We test the relation between the degree of underpricing and a set of exogenous variables hypothesized to affect the underpricing. Estimation based on multivariate regression analysis shows that retained capital, oversubscription rate, listing delay and offer price, significantly influence the underpricing level of Tunisian IPO's. We report also that irrational investors (Ipoers) who rely on side information and rumours to subscribe to potentially "good" IPOs dominate the Tunisian IPO market. Besides, our results find a strong evidence of underwriter's price support.

To further explore the extent of our results, we introduced three control variables: the participation of institutional investors to the IPO, the existence of liquidity contracts (two features of the Tunisian market) and the level of price discount. None of these variables plays any role in reducing neither the asymmetry information nor the uncertainty surrounding IPOs.

The results of this study have two policy implications. First, they provide useful information for prospect investors (especially international) who are interested in the Tunisian IPO market. Second, they offer insights to policy makers and regulator to better understand initial returns and thus to reduce adverse impacts of market irregularities and price volatility around listing periods.

This study could be extended in several ways. One might use other proxies for ex ante uncertainty, such as taking into account the high-tech features of the issuer. It is also interesting to investigate short-run performance using alternative measures of market-adjusted returns. Finally, it is worthy to examine the after-market performance of IPOs over longer horizons.

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