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UNDERPRICING AND EX ANTE UNCERTAINTY IN IPOS: EVIDENCE FROM THE TUNISIAN STOCK MARKET

Ahmed JERIBI
University of Sfax, Sfax, Tunisia
ahmedjeribi07@yahoo.fr

Abstract
In our paper, we use a sample of 33 IPOs listed on the Tunisian Stock Exchange (TSE) from 1994 to 2012 in order to study how the ex ante uncertainty affects the total and the involuntary underpricing. We find that the most underpriced firms are IT firms and those which choose the fixed price mechanism and have the little issue size and the lowest number of days between the prospectus registration and the first day of the subscription period. We also find that only the firm's sector and the number of days between the prospectus registration and the first day of the subscription period affect involuntary underpcing.
Keywords: Initial public offering (IPO), Ex ante uncertainty, Total underpricing, Involuntary underpricing.

1. INTRODUCTION

Many studies argue that the firm's valuation uncertainty is related to the level of the information asymmetry relative to the company. Ritter (1984) argued that riskier IPOs will be more underpriced than less-risky ones. The risk can reflect the complexity of the pricing problem. The author introduced "the changing risk composition hypothesis". Rock (1986), Beatty and Ritter (1986), Lowry et al. (2010) and Jeribi and Jarboui (2015, b) assume that firms which have uncertain prospects are inherently difficult to value. They postulate that underprincing is the efficient reasponse to this valuation problem. Lowry et al. (2010) assume that the complexity of the IPO pricing limits the ability of the underwriters to precisely value IPOs. This complexity is related to the market-wide factors and the firm's-specific factors. Ljungqvist (2006) categorized ex ante uncertainty proxies into four groups: company's characteristics, offering characteristics, prospectus disclosure, and aftermarket variables.

Jeribi et al. (2014) decomposed total underpricing into voluntary and involuntary underpricing. In this paper, we use 33 Tunisian IPOs between 1994 and 2012 and examine how the firm's valuation uncertainty measured by the ex ante uncertainty proxies affect total underpricing and involuntary undepricing.

This paper can have an important contribution to the literature. This contribution is the study of the relationship between the ex ante uncertainty and the involuntary underpricing. The rest of this study is organized as follows: Section 2 briefly reviews the existing literature; Section 3 presents the sample and the methodology; Section 4 presents the empirical results; Section 5 concludes.

2. LITERATURE REVIEW

Beatty and Ritter (1986) argue that there is an equilibrium relation between the expected underpricing and the ex ante uncertainty regarding the firm's value. They demonstrate that there is a monotonous relationship between expected underpricing and the uncertainty of investors about its value. They find that there is a positive relationship between the ex ante uncertainty about IPO share value and the underpricing. This positive relationship makes it is difficult for investors to estimate the initial returns on a high-risk IPO. The authors predict that the firm's size is negatively associated with underpricing. They assume that small firms and small issues are more volatile and uncertain. Michaely and Shaw (1994) confirmed the prediction of Beatty and Ritter (1986) and show that the issue size has a significant role in explaining the degree of underpricing. The results of Mok and Hui (1998) suggest that a bigger issue is less risky than a smaller one. Beatty and Ritter (1986), Ritter (1991), Lowry and Schwert (2004) and Lowry et al. (2010) find that IT and younger firms are the riskiest and consequently the most underpriced.

Jeribi and Jarboui (2015, b) examine the role of the ex ante uncertainty in the pre-listing Tunisian IPO process. First, they test the relation between the deliberate price discount level and the ex ante uncertainty proxies. They find that higher ex ante uncertainty does not always lead to a high discount level. Second, they tested the relation between the subscription ratio and the deliberate price discount level. They find that signaling through the discount level isn't credible for investors. Third, they test the relation between the investors' demand during the subscription period and the ex ante uncertainty proxies. They find that the level of uncertainty and information asymmetry surrounding the IPO firms is the most important determinant of the investors' demand during the subscription period. They argue that a firm can reduce the issue size, the number of days between the prospectus registration and the first day of the subscription period and the subscription period in order to stimulate the investors' demand.

Jeribi et al. (2014) examine the total and involuntary underpricing. They define involuntary underpricing as the difference between the closing price and the fair value estimate, divided by the fair value estimate. They find that the total and involuntary underpricing are explained by the investors' demand and the underwriter's reputation. Jeribi and Jarboui (2015, a) determine the minimum price required by

an investor allowing for recovering the initial investment, information costs, transaction costs, and the offsetting of shortfall. They expect that the initial return of an IPO share in the Tunisian market is positively related to the following factors: the number of non-institutional investors who participate during the subscription period, the subscription ratio of institutional investors, the expected rate of return by investors, the gap between the closing date of the subscription period and the day following the announcement of the subscription result, the gap between the announcement of the subscription result and the first listing day, the number of trading days, the cost of information and the transaction costs. However, it is negatively related to other determinants, such as the discount level, the number of shares allocated for a non-institutional investor and the number of offered shares, which are allocated to non-institutional investors.

3. SAMPLE AND METHODOLOGY

3.1 Sample

The initial sample is similar to that of Jeribi and Jarboui (2015, b). It consists of 33 IPOs collected from the TSE during the period from 1994 to 2012. The data used in our study come from different sources. Thus, the listing prospectuses of the period (2006-2012) are extracted from the Financial Market Council (FMC) website and whereas those of the period (1994-2005) are drawn manually from the library of the FMC. The share prices of the period (1998-2012) are extracted from the TSE website and those of the period (1994-1997) are drawn manually from the archive of the TSE.

3.2 Methodolgy

Rock (1986) and Beatty and Ritter (1986) argue that underprincing is the efficient response to the complexity of the IPO pricing. Beatty and Ritter (1986) use the firm's size and age and the issue size as ex ante uncertainty proxies. Loughran and Ritter (2002), Lowry and Schwert (2004), Lowry et al (2010) and Jeribi and Jarboui (2015, b) use the firm's sector as ex ante an uncertainty proxy. They find that IT firms are the riskiest and are the most requested. Rock (1986), Loughran et al (1994) and Chowdhry and Sherman (1996) find that the fixed offer price mechanism is associated with the most underpricing level. Lee et al. (1996) decompose the period between the official registration of the prospectus and the beginning of exchange trading into three sub-periods: the period between the official registration of the prospectus and the opening of the issue to subscribers, the subscription period and the period between the issue closing and the beginning of exchange trading. They find that underpricing is positively related to these three periods. Lowry et al. (2010) suggest that the valuation problem for IPO firms with uncertain prospects is related to the firm-specific factors and the market-wide factors. Ljungqvist (2006)

categorizes ex ante uncertainty proxies into four groups: the company and the offering characteristics, the prospectus disclosure, and the aftermarket variables.

In our study, we focus on the company's characteristics and the offering characteristics by the use of the same variables as Jeribi and Jarboui (2015, b). First, we study the relation between the underpricing and the proxies for ex ante uncertainty regarding the company's characteristics.

The regression model (1) is specified as follows:

$$U_i = \alpha_0 + \alpha_1 LOG(MV)_i + \alpha_2 LOG(AGE)_i + \alpha_3 \mathrm{IT}_i + \alpha_4 ALTERNATIVE_i + \varepsilon_i \quad (1)$$

Where;

U is the total underpricing. It is defined as (Closing−Offer) /Offer, where Closing and Offer are the first listing day closing and the offer prices, respectively. LOG (MV) is the natural logarithm of the market value of the equity defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). LOG (AGE): The natural logarithm of the firm's age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry, and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm will be listed on the alternative market, and zero otherwise.

Second, we study the relation between total underpricing and the proxies for ex ante uncertainty regarding the offering characteristics. The regression model (2) is specified as follows:

$$U_i = \alpha_0 + \alpha_1 OPF_i + \alpha_2 LOG(IS)_i + \alpha_3 SD_i + \alpha_4 N_i + \varepsilon_i \quad (2)$$

Where;

U is the total underpricing. It is defined as (Closing−Offer) /Offer, where Closing and Offer are the first listing day closing and the offer prices, respectively. LOG (IS): The natural logarithm of the issue size which is defined as the total number of shares offered to the public multiplied by the offer price; OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and zero otherwise. SD: The number of the subscription days. N: The number of days between the prospectus registration and the first day of the subscription period.

Jeribi et al. (2014) divide total undericing into voluntary and involuntary underpricing. The deliberate price discount is the voluntary underpricing. They define involuntary underpricing as the difference between the closing price and the fair value estimate, divided by the fair value estimate. Jeribi and Jarboui (2015, b) studied the relation between the deliberate price discount and the proxies for ex ante uncertainty. In our study, we use the same steps as when studying the relationship between the total underpricing and the proxies for ex ante uncertainty and we study the relationship between the involuntary underpricing and the proxies for ex ante uncertainty.

First, we study the relation between the involuntary underpricing and the proxies for ex ante uncertainty regarding the company characteristics.

The regression model (3) is specified as follows:

$$IU_i = \alpha_0 + \alpha_1 LOG(MV)_i + \alpha_2 LOG(AGE)_i + \alpha_3 \mathrm{IT}_i + \alpha_4 ALTERNATIVE_i + \varepsilon_i \quad (3)$$

Where;

IU is the involuntary underpricing. It is defined as (Closing−FV) /Offer, where Closing and FV are the first listing day closing price and the fair value, respectively. LOG (MV) is the natural logarithm of the market value of the equity defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). LOG (AGE): The natural logarithm of the firm's age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry, and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm will be listed on the alternative market, and zero otherwise.

Second, we study the relation between the involuntary underpricing and the proxies for ex ante uncertainty regarding the offering characteristics. The regression model (4) is specified as follows:

$$IU_i = \alpha_0 + \alpha_1 OPF_i + \alpha_2 LOG(IS)_i + \alpha_3 NSD_i + \alpha_4 N_i + \varepsilon_i \quad (4)$$

Where;

IU is the involuntary underpricing. It is defined as (Closing−FV) /Offer, where Closing and FV are the first listing day closing price and the fair value, respectively.LOG (IS): The natural logarithm of the issue size which is defined as the total number of shares offered to the public multiplied by the offer price; OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and

zero otherwise. NSD: The number of the subscription days. N: The number of days between the prospectus registration and the first day of the subscription period.

4. EMPIRICAL RESULTS

Table 1 presents the descriptive statistics for a full sample of 33 Tunisian IPOs. We show that the total underpricing (25%) is lower than what was found by Gana and El Ammari (2008), Ben Slama et al. (2011), Jeribi et al. (2014) and higher than the one found by Ben Naceur and Ghanem (2001), Mefteh Rekik and Boujelbene (2013) and Kanoun and Taktak (2013) on the Tunisian financial market. For the newly listed securities and during the first three trading days, the allowable range is determined by applying a percentage fluctuation ± 18% compared to the reference price of the day, no additional percentage fluctuation is allowed. During these three sessions, only one fixing is programmed by session. However, these special rules cease to be applicable when a course is set during one of the first two sessions. When the ±6.09% price limit is applied to all listed securities, the IPO shares aren't allowed to be freely traded until the price is determined to be in the range of the allowed prices. With the agreement of the CMF, the underwriters can legally support the IPO prices in the Tunisian market by signing a contract of liquidity for a determined period. The underwriter guarantees the regulation of the security price by purchasing or selling. The involuntary underpring level (12%) is lower than the total underprcing. This can be explained by the high deliberate discount level (voluntary underpricing) that IPO firms practice.

TABLE 1 – DESCRIPTIVE STATISTICS OF THE SAMPLE

Variables	Mean	Median	Max	Min	Std.dev
U	0,25	0,16	0,90	-0,02	0,27
IU	0,12	0,03	0,80	-0,25	0,25
MV	106170,58	44447,44	615707,2	9315,03	136099,2
AGE	29,06	21,56	106,01	1,24	24,15
IT	0,06	n/a	n/a	n/a	n/a
ALTERNATIVE	0,12	n/a	n/a	n/a	n/a
OPF	0,24	n/a	n/a	n/a	n/a
IS	19361,56	10252,83	123141,47	2000	23764,75
SD	13,48	12	30	5	5,83
N	14,39	12	60	6	10,59

This table reports descriptive statistics for the whole sample of 33 Tunisian between 1994 and 2012. The data are collected from the CMF database, TSE database and IPO prospectuses. U: The total underpricing. It is defined as (Closing−Offer) /Offer, where Closing and Offer are the first listing day

closing and the offer prices, respectively. IU: The involuntary underpricing. It is defined as (Closing−FV) /Offer, where Closing and FV are the first listing day closing price and the fair value, respectively. MV: The market value of the equity. It is defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). AGE: The firm age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry (computer equipment, electronics, and general IT), and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm is listed on the alternative market, and zero otherwise. OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and zero otherwise. IS: The issue size. It is defined as the total number of shares offered to the public multiplied by the offer price (inflation adjusted to the 2012 value). SD: The number of the subscription days. N: The number of days between prospectus registration and the first day of the subscription period.

We find that only 6% of the firms are in a high-tech industry. This small percentage by the means that this industry is relatively new in Tunisia and this sector requires strong investment in research and development. However, the Tunisian market is relatively small due to the small population size and the low Tunisian GDP. We also find that 12% of the firms that make up our sample are listed on the alternative market. Indeed, this market which is reserved to small and medium-sized companies was launched in 2008, which means that it is relatively new. IPO firms can choose between the four following selling mechanisms: direct registration, minimum sale price, open offer price, and fixed-price offering. When the capital of the IPO firm is sufficiently diffused to the public, the direct registration mechanism (procedure) allows the TSE to proceed to the direct registration of the shares on the market (principal and alternative) in order to be traded with an initial price fixed by the TSE. If the firm is listed on the alternative market, the fraction of institutional shareholdings retained one year before the IPO should be at least at the level of 20%. A notice emanating from the TSE must be published at least two days before the first listing day. It must specify the date of the first listing and the initial price. The minimum sale price mechanism allows the pre-IPO shareholders and underwriters to sell a quantity of securities at a minimum price the day of the introduction. The TSE centralizes the purchasing orders submitted by the underwriter. The orders with a limited price are only accepted and those which abnormally exceed the minimum sale are eliminated. The TSE selects and classifies the purchasing orders according to their price limit then satisfies these orders completely or partially and fixes the introduction listed price which is single and corresponds to the lower price limit of the last served order. Tunisian issuers can also use a modified bookbuilding procedure called the open offer price that consists in making a number of securities available to the public by fixing a price range which can be modified by the underwriter, provided that he has the agreement of the TSE. In order to determine the

final price, the leading underwriter collects the orders issued by the institutional investors and uses the bookbuilding technique. In a fixed-price offering, a fixed number of securities is offered at a fixed price. The Stock Exchange centralizes the orders submitted by the underwriters. The only accepted orders are those which are presented at the offer price. From table 1, we can see that 24% of the IPO firms choose the fixed price mechanism (OPF).

TABLE 2 – PEARSON CORRELATION COEFFICIENTS BETWEEN INDEPENDENT VARIABLES

N =33

	LOG (MV)	LOG(AGE)	IT	ALTERNATIVE	OPF	LOG(IS)	SD	N
LOG(MV)	1							
LOG(AGE)	0,1961	1						
IT	-0,1778	0,1072	1					
ALTERNATIVE	-0,2172	-0,2935*	0,2948*	1				
OPF	0,2351	0,0896	0,4490***	0,6565***	1			
LOG(IS)	0,9085***	0,3033*	-0,2616	-0,2015	0,2693	1		
SD	-0,1284	0,1954	0,0228	-0,1445	0,0138	0,0104	1	
N	-0,0491	0,2285	0,5507***	0,075	0,3991**	-0,0488	0,1395	1

This table reports the results of Pearson correlation coefficients between independent variables. The base sample includes 33 IPOs listed on TSE between 1994 and 2012. The data for regressions are collected from the CMF database, TSE database and IPO prospectuses. LOG (MV) is the natural logarithm of the market value of the equity defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). LOG (AGE): The natural logarithm of the firm age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry, and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm is listed on the alternative market, and zero otherwise. OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and zero otherwise. LOG (IS): The natural logarithm of the issue size which is defined as the total number of shares offered to the public multiplied by the offer price (inflation adjusted to the 2012 value). SD: The number of the subscription days. N: The number of days between prospectus registration and the first day of the subscription period. *** the correlation is significant at the 1% level (bilateral); ** the correlation is significant at the 5% level (bilateral); * the correlation is significant at the 10% level (bilateral).

In order to identify the potential problems of multicolinearity among the independent variables of our study, we establish a correlation matrix. Table 2 presents the results of Pearson correlation coefficients between the independent variables. The results reveal significant relationships among many independent variables with low correlation coefficients. However, we find that the correlation coefficient

between LOG (MV) and LOG (IS) is very high. We also show that the correlation coefficient value is important (65.65%) for OPF and ALTERNATIVE.

TABLE 3 – TOTAL UNDERPRICING AND EX ANTE UNCERTAINTY

Variables	Exp sign	regression (1)	regression (2)	regression (3)
Constant		0,8480	2,1201	1,0711
		(0,9989)	(2,4400)	(1,1700)
LOG(MV)	-	-0,0332		
		(-0,6976)		
LOG(AGE)	-	-0,0086		0,0144
		(-0,1962)		(0,3232)
IT	+	0,2014		0,4302*
		(0,9322)		(1,7129)
ALTERNATIVE	+	0,0994		0,0840
		(0,6177)		(0,5430)
OPF	+		0,2561**	
			(2,1722)	
LOG(IS)	-		-0,1069*	-0,0425
			(-2,0286)	(-0,7464)
SD	-		-0,0041	-0,0038
			(-0,5262)	(-0,4645)
N	-		-0,0089*	-0,0104*
			(-1,8787)	(-1,9266)
R2		0,0963	0,2292	0,2260
Adj R2		0,0328	0,1191	0,0474

This table reports the results of ordinary least squares (OLS). The base sample includes 33 IPOs listed on TSE between 1994 and 2012. The data for regressions are collected from the CMF database, TSE database and IPO prospectuses. Dependent variable is the total underpricing. It is defined as (Closing−Offer) /Offer, where Closing and Offer are the first listing day closing price and the offer price, respectively. LOG (MV) is the natural logarithm of the market value of the equity defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). LOG (AGE): The natural logarithm of the firm age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry, and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm is listed on the alternative market, and zero otherwise. OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and zero otherwise. LOG (IS): The natural logarithm of the issue size which is defined as the total number of shares offered to the public multiplied by the offer price (inflation adjusted to the 2012 value). SD: The

number of the subscription days. N: The number of days between prospectus registration and the first day of the subscription period. * Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Table 3 presents the results of the OLS model regressions. In regression (1), we test the relation between the total underpricing and the proxies for ex ante uncertainty regarding the company's characteristics (firm size, age, industry and market). We find that there is no significant statistics relationship between total underprcing and the proxies for ex ante uncertainty regarding the company characteristics. In regression (2), we test the relation between the total underpricing and the proxies for ex ante uncertainty regarding the offering characteristics. The coefficient on the OPF is positive and significantly different from zero at 0.05 level. This result indicates that firms which choose the fixed price mechanism are more underpriced than others. This result confirms that of Reber and Fong (2006), Agarwal et al. (2008) and Jeribi and Jarboui (2015, b) who found that IPO firms which choose the fixed price mechanism are the most over-subscripted. The coefficient on the issue size is negative and significantly different from zero at 0.1 level. This result indicates that firms which have the little issue size are more underpriced than others. This result confirms that of Beatty and Ritter (1986) and Jeribi and Jarboui (2015, b). We also find a negative and significant relationship (at the 0.1 level) between the underpricing level and the number of days between prospectus registration and the first day of the subscription period. This last result is consistent with the prediction of Lee et al. (1996) and the result of Jeribi and Jarboui (2015, b). However, it is inconsistent with the result of Jeribi and Jarboui (2015, a). In regression (3), we test the relation between total underpricing and the proxies for ex ante uncertainty. We find that the variable TECH has a positive and significant effect (at the 0.1 level) on the underpricing. This result is similar to that of Zheng and Li (2008), Lowry et al (2010) and Jeribi and Jarboui (2015, b). From table 3, we conclude that only the proxies for ex ante uncertainty regarding the offering characteristics affect underpcing. The most underpriced firms are IT firms and those which choose the fixed price mechanism and have the little issue size and the lowest number of days between the prospectus registration and the first day of the subscription period.

TABLE 4 – INVOLUNTARY UNDERPRICING AND EX ANTE UNCERTAINTY

Variables	Exp sign	regression (1)	regression (2)	regression (3)
Constant		0,6513	1,7112**	0,9050
		(0,8087)	(2,0369)	(1,1063)
LOG(MV)	-	-0,0295		
		(-0,6537)		
LOG(AGE)	-	-0,0076		0,0191
		(-0,1828)		(0,4805)

IT	+	0,2621		0,5507**
		(1,2784)		(2,4536)
ALTERNATIVE	+	-0.0083		-0,0305
		(-0,0549)		(-0,2205)
OPF	+		0,1769	
			(1,5517)	
LOG(IS)	-		-0,0890	-0,0382
			(-1,7461)	(-0,7501)
SD	-		-0,0045	-0,0049
			(-0,6078)	(-0,6701)
N	-		-0,0086*	-0,0128**
			(-1,8787)	(-2,6502)
R2		0,0865	0,1908	0,3059
Adj R2		0,0440	0,0751	0,1458

This table reports the results of ordinary least squares (OLS). The base sample includes 33 IPOs listed on TSE between 1994 and 2012. The data for regressions are collected from the CMF database, TSE database and IPO prospectuses. Dependent variable is the involuntary underpricing. It is defined as (Closing−FV) /Offer, where Closing and FV are the first listing day closing price and the fair value, respectively. LOG (MV) is the natural logarithm of the market value of the equity defined as the total number of IPO shares multiplied by the offer price (inflation adjusted to the 2012 value). LOG (AGE): The natural logarithm of the firm age (in number of years) at the time of the IPO. IT: Dummy variable which equals one if the firm is in a high-tech industry, and zero otherwise. ALTERNATIVE: Dummy variable which equals one if the IPO firm is listed on the alternative market, and zero otherwise. OPF: Dummy variable which equals one if the IPO firm chooses the fixed price mechanism (OPF), and zero otherwise. LOG (IS): The natural logarithm of the issue size which is defined as the total number of shares offered to the public multiplied by the offer price (inflation adjusted to the 2012 value). SD: The number of the subscription days. N: The number of days between prospectus registration and the first day of the subscription period. * Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Table 4 presents the results of the OLS model regressions. In regression (1), we test the relation between the involuntary underpricing as entrepreneurial involuntary wealth loss and the proxies for ex ante uncertainty regarding the company's characteristics (firm's size, age, industry and market). Our results suggest that there is no significant statistics relationship between total involuntary and the proxies for ex ante uncertainty regarding the company characteristics. In regression (2), we test the relation between the total involuntary and the proxies for ex ante uncertainty regarding the offering

characteristics. We find that only the variable N has a negative and significant effect on the involuntary underpricing level at 0.1 level. In regression (3), we test the relation between the involuntary underpricing and the proxies for ex ante uncertainty. We find that the variable IT has a positive and significant effect (at the 0.05 level) on the involuntary underpricing. We also find that there is a negative and significant relationship (at 0.05 level) between the involuntary underpcing level and the number of days between the prospectus registration and the first day of the subscription period. From table 4, we conclude that only the firm's sector and the number of days between the prospectus registration and the first day of the subscription period affect involuntary underpcing.

5. CONCLUSIONS

In this paper, we test how ex ante uncertainty affects total and involuntary underpricing. First, we test the relation between the total underpricing and the ex ante uncertainty proxies. We find that only the proxies for ex ante uncertainty regarding the offering characteristics affect underpcing. The most underpriced firms are IT firms and those which choose the fixed price mechanism and have the little issue size and the lowest number of days between prospectus registration and the first day of the subscription period. Second, we test the relation between involuntary underpricing and the ex ante uncertainty proxies. We find that only the firm's sector and the number of days between the prospectus registration and the first day of the subscription period affect involuntary underpcing. Finanly, we can conclude that the level of uncertainty and information asymmetry surrounding the IPO firms is the most important determinant of the total and the involuntary underpricing. However, Jeribi and Jarboui (2015, b) found that the level of uncertainty and information asymmetry surrounding the IPO firms are the most important determinants of the investors' demand during the subscription period.

REFERENCES

Aggarwal, S., Liu, C. and Rhee, R. (2008). Investor demand for IPOs and aftermarket performance: Evidence from the Hong Kong stock market. *Journal of International Financial Markets, Institutions and Money*, 18 (2), 176–190.

Ben Slama, S., Boudriga, A. and Boulila, N. (2011). Determinants of IPO underpricing: Evidence from Tunisia. *The International Journal of Business and Finance Research*, 5 (1), 3-32.

Benveniste, L.M.and Spindt, P.A., (1989). How investment bankers determine the offer price and allocation of new issues? *Journal of Financial Economics* 24 (2), 343– 361.

Beatty, R. and Ritter, J.R., (1986). Investment banking, reputation, and the underpricing of initial public offerings. *Journal of Financial Economics* 15 (1), 213–232.

Ben Naceur, S.and Ghanem, H., (2001). The Short and Long-run Performance of New Listings in Tunisia. *International Review of Finance* 2 (4), 235–246.

Chowdhry, B.and Sherman, A., (1996). The winner's curse and international methods of allocating initial public offerings. *Pacific-Basin Finance Journal* 4 (1), 15–30.

Gana, M.R.and El Ammari, A., (2008). Initial underpricing and transfer of shares on the Tunisian stock exchange. *Journal of Corporate Ownership and Control* 5 (3), 434–444.

Jeribi, A.and Jarboui, A., (2014). Explaining deliberate IPO price discount: Evidence from the Tunisian stock market. *International Journal of Business and Emerging Markets* 6 (2), 121–138.

Jeribi, A.and Jarboui, A., (2015). (a). The minimum price required by investors in IPOs. Decision *Science Letters*, 4 (1), 63-76.

Jeribi, A.and Jarboui, A., (2015). (b). The role of the ex ante uncertainty in the pre-listing IPO process: Evidence from the Tunisian stock market. *International Journal of Economics and Business Research*. In press.

Jeribi, A., Jeribi Masmoudi, M., and Jarboui, A. (2014). Voluntary and Involuntary Underpricing in IPOs. *Global Business and Management Research: An International Journal*, 6 (2), 122-138 .

Kanoun, S.and Taktak, S., (2013). Information asymmetries, issuers' incentives and underpricing in emerging market: Some evidence from Tunisian IPO firms. *International Journal of Economics, Commerce and Research* 3 (5), 83–94.

Lee, P.J., Taylor, S.L. and Walter, T.S., (1996). Expected and realized returns for Singaporean IPOs: initial and long-run analysis. *Pacific-Basin Finance* 4 (2), 153–180.

Ljungqvist, A.,(2006). *IPO underpricing*. In: Eckbo, B.E. (Ed.), Handbook of Empirical Corporate Finance. North-Holland.

Loughran, T.and Ritter, J.,(2002). Why don't issuers get upset about leaving money on the table in IPOs. *Review of Financial Studies* 15 (2), 413–444.

Loughran, T., Ritter, J.R.and Rydqvist, K., (1994). Initial public offerings: international insights. *Pacific Basin Finance Journal* 2 (2-3), 165–19.

Lowry, M.and Schwert, W., (2004). Is the IPO pricing process efficient? *Journal of Financial Economics* 71 (1), 3–26.

Lowry, M., Officer, M. and Schwert, W., (2010). The Variability of IPO Initial Returns. *Journal of Finance* 2 (1), 425–466.

Mefteh Rekik, Y.and Boujelbene. Y., (2013). Tunisian IPOs underpricing and long-run underperformance: Highlight and explanation. E3 *Journal of Business Management and Economics* 4(4), 93-104

Michaely, R.and Shaw, W., (1994). The pricing of initial public offerings: tests of adverse-selection and signaling theories. Review *of Financial Studies* 7 (2), 279–319.

Mok, H.and Hui, Y., (1998). Under-pricing and aftermarket performance of IPOs in Shanghai, China. *Pacific-Basin Finance Journal* 6 (5), 453–474.

Reber, B.and Fong, C., (2006). Explaining mispricing of initial public offerings in Singapore. *Applied Financial Economics* 16 (18), 1339–1353.

Ritter, J., (1984). The 'hot issue' market of 1980. *Journal of Business* 57 (2), 215–241.

Ritter, J., (1991). The long-run performance of initial public offerings. *Journal of Finance* 46 (1), 3–27.

Rock, K., (1986). Why new issues are underpriced. *Journal of Financial Economics* 15 (1-2), 187–212.

Zheng, S.X.and Li, M., (2008). Underpricing, ownership dispersion, and aftermarket liquidity of IPO stocks. *Journal of Empirical Finance* 15 (3), 436–454.