

Initial Performance of Greek IPOs, Underwriter's Reputation and Oversubscription^(a)

Dimitris F. Kenourgios, Department of Accounting and Finance, Athens University of Economics and Business, Address for correspondence: 5 Stadiou Str., 1st Floor, Office 115, GR 10562 Athens, e-mail: dkenourg@econ.uoa.gr

Spyros Papathanasiou, School of Social Sciences, Hellenic Open University, 140 Asklipiou Str., GR 11471 Athens

Emmanouil Rafail Melas, Department of Accounting and Finance, London School of Economics, UK.

Abstract: This paper provides additional international evidence on the IPOs by examining the initial performance and two main determinants of short-run underpricing of 169 IPOs listed on the Athens Stock Exchange (ASE) over the period 1997-2002. The initial performance of the IPOs is measured by calculated two formulas: the raw returns and the excess or adjusted returns of the first, fifth and twenty first day respectively. Furthermore, we use a proxy to rank the underwriters' prestige along with the times of oversubscription, which are introduced as explanatory variables in our model. The results of the analysis provide evidence of significant underpricing. Furthermore, the cross sectional analysis on the determinants of the IPOs shows that both the underwriters' prestige and the times of oversubscription significantly affect the underpricing level of the IPOs over the most important and "hot" period for the Greek emerging stock market since its establishment, in terms of growth rates, acceleration of the going public process and volatility of market and stock returns.

Keywords: IPOs, underpricing, oversubscription, underwriters' prestige, Athens Stock Exchange.

JEL classification: G24, G32

^(a) This paper has been accepted for publication in **Managerial Finance** (forthcoming).

I. Introduction

In this study it is analysed one of the asset market anomalies, the underpricing of initial public offerings (IPOs) of new shares. This is a very interesting topic because it has always been a mystery why the IPOs are priced in a manner that results in such large positive average initial returns. When a firm issues a public traded equity for the first time it follows different patterns of share price fluctuations. Such anomalous price behaviour violates the Efficient Market Hypothesis (EMH) and on average leads to arbitrage profits for those who have an advantage in gaining information.

Numerous researches have been carried out to theorise the empirical findings and thus challenges us to construct a framework of the hypotheses formulated to explain the underpricing phenomenon as a conceptual groundwork for the present study. All these hypotheses emerged from the finance literature are based on the uncertainty inherent in the IPO process and have their limitations. Having discussed the basic framework, we move on to provide empirical evidence using the population of the IPOs of the Athens Stock Exchange (ASE) during the period 1997-2002.

The primary purpose of this paper is to reveal the existence and magnitude of short-run underpricing over the most important and “hot” period for the ASE since its establishment. Moreover, this study aims to provide an insight primarily into the hypothesis of prestigious underwriters and the relationship between oversubscription and underpricing as well, using a proxy to rank the underwriter’s prestige along with the times of oversubscription which are introduced as the explanatory variables in our model.

This is of particular interest for three reasons. First, the limited existed research on the Greek IPO market concentrated only to the degree of the underpricing not providing any explanation of this phenomenon. Second, this investigation has been applied mainly on developed and Far East Asia markets, in contrast to emerging markets as in the case of the ASE during the examined period. Third, the oversubscription level of the IPOs and the underwriting facilities have grown significantly, especially during the period 1997-2000 in which the ASE has witnessed a boom and both the number of new IPOs and the total amount sought to be raised have increased rapidly. Beatty and Ritter’s (1986) inverse relationship between the reputation of the lead underwriter of an IPO and the IPO’s return will be exemplified and then we

show that both these explanatory variables are the main determinants of the excess returns of the new public offerings.

The remainder of the article is structured as follows: Section II presents the international experience according to the main studies on the initial performance of IPOs in Greece and selected European and international markets. Section III provides a brief literature review regarding the fundamental hypotheses that have been developed in order to provide the reasons for underpricing. Section IV reports the research data and the methodology followed. Section V provides the empirical results and finally, we offer our concluding comments in Section VI.

II. International Evidence

In the short-run, the process of going public is highly correlated with large initial returns to investors who obtain IPOs of common stock. Several studies show that initial underpricing is usual in every stock market across the world. Table I provides a summary of the main studies on the performance of the IPOs in Greece and selected European and international markets.

Underpricing varies from 5.4% in Canada to 388% in China. In the case of Greece, the existing literature on the performance of IPOs is limited. For example, Kazantzis and Levis (1995) investigate the IPOs in Greece using a sample of 79 firms going public between 1987 and 1991. Their results show that Greek IPOs are on average underpriced by 48.5%. Kazantzis and Thomas (1996) find that the mean first day raw and adjusted return for the Greek IPOs are 50.89% and 51.73% respectively during the period 1987-1994. Also, Kollintzas et al. (1996) report an average initial adjusted return of 26.3% during the period 1972-1994.

take in Table I

Generally, from the empirical results of Table I it seems that the underpricing is not affected by the political environment and the magnitude of this phenomenon is relatively higher for the emerging markets than the other financial markets.

Although in the short run the performance of IPOs is highly correlated with abnormal positive returns, this seems not to hold in the long run. For example, Ritter (1991) examined the market behaviour of new firms in the U.S. over three years after going public. He found that the shares of these firms significantly underperformed in the long run.

III. Literature Review

The underpricing of the initial public offerings has challenged numerous researchers to explain this phenomenon. The hypotheses that have been developed on this subject and emerged from the finance literature form a framework which analyse the reasons for underpricing. These explanations stem from the large amount of uncertainty and the information asymmetry among the issuer, the underwriter and the investors. The fundamental hypotheses which deal with the explanation of this phenomenon are briefly reviewed below.

i. Monopsony Power of Underwriter Hypothesis. Under the assumption of perfect or symmetric information, Ritter (1984) argues that the investment bankers take advantage of their superior knowledge of market conditions to underprice the offerings to maximise their revenues.

ii. Winner's Curse Hypothesis. Rock (1986) argues that the uninformed investors face the winners curse since only ex-post can observe if the offering in which they participated was a "lemon" or not. Therefore, under the condition of asymmetry between informed and uninformed investors, IPO returns are required by uninformed investors as compensation for the risk of trading against superior information.

iii. Hypothesis of Prestigious Underwriters. Under the condition of asymmetric information between issuers and investors, Beatty and Ritter (1986) argue that the underwriters care about their reputation and therefore do not underpricing too much the IPOs. Also, Carter and Manaster (1990) argue that the underwriters have an advantage in information and therefore undertake only high quality offerings in order to build their reputation and to maintain their high prestige. Carter et al. (1998) examine the effect of underwriter's reputation on the degree of underpricing and support Beatty and Ritter's hypothesis. Following the same line, Booth and Smith (1986) underpinning the role of underwriters in the capital raising process through the certification hypothesis.

iv. Lawsuit Avoidance Hypothesis. Under the condition of symmetric information, Tinic (1988) argues that underpricing is one way of reducing the frequency and the cost of future lawsuits. However, Drake and Vetsuypens (1993) criticize and reject this hypothesis.

v. Signalling Hypothesis. According to Allen and Faulhaber (1989) and Grinblatt and Huang, (1989), into the framework of asymmetric information, the underpriced new

issues “leave a good taste” to investors, allowing the firms and insiders to sell future offerings at a higher price than otherwise would be the case.

vi. Market Feedback Hypothesis. According to Benviste and Spindt (1989) and Jegadeesh et al. (1993), under the condition of asymmetric information between underwriters and investors, the underwriters underprice the IPOs to induce regular investors to reveal information during the pre-selling period and through the book building process underwriters obtain valuable information which assists them to re-price the new issue.

vii. Market Bandwagon Hypothesis. Welch (1992) argues that the potential investors not only pay attention to their own information about the new issue but also to whether other investors are purchasing. This ration may develop bandwagon effects. The underwriter will underprice the new issue in order to attract the first few potential investors to buy and induce a bandwagon in which all subsequent investors want to buy irrespective of their own information.

viii. Ownership Dispersion or Control Hypothesis. Brennan and Franks (1997) argue that the underpricing of the issue could reduce the risks of a hostile takeover since it will lead to oversubscription, generating on the one hand an increased liquidity of the market for the stock and on the other hand a large number of small shareholders.

The overwhelming majority of empirical studies assume asymmetric information because the results are more plausible and the majority of these hypotheses are supported by empirical findings. However, it should be stressed that some of the above hypotheses which are merely based on strong assumptions might be unfeasible. Generally, most underpricing explanations seem to be well grounded but care must be taken when dealing with such market anomalies.

IV. Research Data and Methodology

Our sample consists of 169 IPOs launched on the ASE from 1/1/1997 to 31/12/2002, which is actually the population of public offerings of this period. The sample included only listings of common stocks, while preference stocks as well as transfers from the one market to another are not examined here. The main sources of the construction of IPOs database are the Annual Reports of Hellenic Capital Market Commission and the Annual and Monthly Statistical Bulletin of ASE. All closing prices were adjusted for dividends, stock splits and any other capital changes.

All data concerned the IPOs of common stock of Main, Parallel and New Stock Exchange Market of the Athens Stock Exchange. Table II exhibits the distribution of the IPOs launched on the ASE by year, market and totally during the period 1997-2002. The year 2000 was the year with the biggest number of listings in the ASE (48 IPOs), while the second year with the most new listings was 1999 (42 IPOs). Furthermore, we should point out that the annual distribution of the new issues of common stocks became according to the time period of public offerings and not according to the first day of entrance of a firm in the ASE for consistency with previous relative studies.

take in Table II

Table III exhibits the value of transactions, the market capitalization, the capital raised through IPOs and the percent change of ASE General Index for the period 1997 to 2002. This six- year period is characterized as extremely important for the ASE. During the period 1997-1999, all the growth figures of the ASE displayed a remarkable increase due to the massive entrance of individual and institutional investors in the capital market. However, the Greek capital market exhibited a severe underperformance from 2000 to 2002 that has been largely resulted on the previous overly optimistic climate about the firms' prospects and the experienced speculative process.

take in Table III

IV.1 Initial Performance of IPOs

The initial performance of the IPOs is estimated by calculated two formulas widely used in international empirical studies: the raw returns and the excess or adjusted returns.

The raw returns are those that compare the price of the share(i) at the time ℓ and at time x , where $(x - \ell)$ is the number of the days between the last day of the offering and the first trading day of the share. Based on the price of each IPO_i (P_0) we estimate the following initial returns on the closing price of the 1st day (P_1), the 5th day-a week later (P_5), and the 21st day -a month later (P_{21}). The formula for the raw returns (underpricing) of the first day for each IPO is defined as:

$$UP = \frac{(\text{Closing price of the } P_x \text{ day}) - (\text{The IPO Price}_{\ell,i})}{\text{The IPO Price}_{\ell,i}} \times 100, \quad (1)$$

where $x=1, 5, 21$, and ℓ, i = the last day of the public offering of the firm i . Working the same way using as base the IPO price, we estimate the raw returns for the 5th and 21st day as well.

Following the same formula used to estimate the raw return of the IPO we use the same intervals to estimate the raw return for the General Index (GI) of the ASE. It is calculated as:

$$\frac{GI_x - GI_{\ell,i}}{GI_{\ell,i}} \times 100 \quad (2)$$

The estimation of excess return combines the returns of the shares with the fluctuations of the market. It is estimated as the difference between the raw return of the IPO for the specified time interval minus the return of the market General Index for the same time interval. This kind of evaluation will reveal whether the IPO over or under-perform the market and is defined as:

$$Excess\ Returns_x = \left[\frac{(P_x - P_{\ell,i})}{P_{\ell,i}} - \frac{(GI_x - GI_{\ell,i})}{GI_{\ell,i}} \right] \cdot 100 \quad (3)$$

where x, ℓ, i defined as above, P is the closing price of the security, and GI is the value of the General Index.

It should be pointed out that the estimation of the excess returns is based on the last day of the offering of the IPOs and therefore we account for the same day for the Gen. Index of the ASE. The reason we use this time interval and not the first day of the offering of the IPO is for the benefit of the investors to register for IPOs on the last date of the offering because by doing so they minimise the time interval they have lock up their capital.

IV.2 The Explanatory Variables and the Model

We test the hypothesis that the more prestigious the underwriter, the higher his incentive to mitigate the underpricing of the IPO. Underwriters are identified by their reputation. In this study reputation is taken to be exogenous. Since there are no official rankings regarding of each underwriter's prestige apart from the data of the corresponding jobs they carried out during the examined time period, and as in the relevant bibliography such a ranking comes ad-hoc according to the data of each researcher, we use as proxy for the underwriter the ratio of capital he has risen from 1997 to 2002 and we assign this value to each corresponding firm. Therefore, we define the value of each underwriter as the relative capital raised (CR) over the total amount of capital raised during the period 1997-2002. Thus, the following formula is estimated:

$$prestige = \frac{CR_j}{\sum_{i=1}^{169} CR_i} \quad (4)$$

where CR_j is the capital raised by each underwriter j and i is the firm that went public.

What we get varies between zero and one. The higher value of underwriter is 0.244 and the lower is 0.007. We regard as prestigious those underwriters whose prestige ratio is above 0.04.

Regarding the actual testing of the hypothesis, a dummy is included to capture the underwriter's effect. Therefore, we assign $D=1$ for prestigious and $D=0$ for non - prestigious underwriters.

It only remains to check in algebraic terms what our assumption predicts. For instance, if $D=1$ (stands for prestigious), the theory predicts a negative coefficient on the dummy since regressing at the excess returns of the first day price, a negative coefficient on the dummy underwriter would imply that this distance will always be smaller and closer to the price at the end of the first trading day (less underpricing). Conversely, when the dummy takes the value zero (a non-prestigious underwriter) then the distance will be greater (more underpricing).

Extending our analysis, we include the times of oversubscription as an explanatory variable since it is highly positively correlated with the excess returns of the first day. In Table IV, we show the correlation between the times of oversubscription and the first day adjusted returns of the IPOs. This highly positive relationship between these two variables means that the greatest part of the oversubscription of a public offering implies a strong interest from the side of investors for each firm.

take in Table IV

The high level of significance of oversubscription may also explain the underpricing under the assumption that there is an information leakage during the public offering (Chowdhry and Sherman, 1996). Table V reports the mean, maximum and minimum values of the times of oversubscription of the IPOs launched in ASE by year and for the entire examined period. Such oversubscription levels with mean of 89.96 times during the period 1997-2002 indicate that even uninformed investors are able to correctly “guess” that the offer price was too low and therefore they could create a bandwagon effect.

take in Table V

Having defined the variables, we now proceed to the model formulated in this study. Using the excess returns ($ER_{x,i}$) of the IPO_i as the dependent variable and as explanatory variables the dummy variable for the prestigious underwriter and the underwriter ($UNDWR_i$) and the times of oversubscription (OS), the following formula is estimated:

$$ER_{x,i} = a_1 + b_1 \underset{(-)}{Dummy_i} + b_2 \underset{(+)}{*UNDWR_i} + b_3 \underset{(+)}{*OS_i} + e_{x,i} \quad (5)$$

where $e_{x,i}$ is the residual of the regression.

For all the regressions the OLS method is used. Furthermore, because cross sectional data and regression equations are used, there are heteroscedasticity problems in the residuals. Therefore, the adjusted White's heteroskedasticity-consistent estimates are employed for all the regressions we do.

V. Empirical Results

In this section, we present the results of the analyses carried out in two stages. In the first stage, the empirical findings of the analysis on the initial performance of the IPOs are presented. In the second stage, the results of the cross sectional analysis on the influence of both the underwriter's prestige and the oversubscription to the underpricing level of the IPOs are provided.

V.1 IPO Returns

In Table VI, we present the results from the average raw and excess returns of IPOs concerning the whole sample of new stock issues took place in ASE during the period 1997-2002.

take in Table VI

The average raw return of the first day is 52.7%, while the average adjusted return is 54.28%. The average raw return of the fifth and the twenty first day is 44.78% and 41.84% respectively, while the average excess return is 45.32% and 43.83% [1].

The results suggest that the new issues were on average underpriced since it had significant returns for those who had participated in the offering and sold the new shares at the closing of the first, fifth and twenty first day respectively.

V.2 Determinants of IPO Returns

Table VII provides the results concerning the explanatory variables (dummy for prestigious underwriters, prestige ratio of underwriters and times of oversubscription) of the underpricing phenomenon in ASE during the period 1997-2002. The signs of the explanatory variables are in line with the theory and also are statistically significant different from zero at 5% and 1% level respectively.

The fit of the line 0.697 is satisfactory since we are dealing with cross sectional data. It is important to emphasize that the dummy coefficient (the prestigious underwriters) is statistically significant different from zero at 10% level of significance and the sign of it is negative. Whether the underwriter is prestigious or not has significant impact on the excess returns and therefore on the magnitude of underpricing. The dummy coefficient measures the average difference in the excess return between prestigious and non-prestigious underwriters. In our analysis, a prestigious underwriter is estimated to result in a 28.58 units reduction in the average excess return.

This finding supports the Beatty and Ritter's hypothesis of prestigious underwriters; our model predicts that the initial excess return on the IPO is negatively correlated with the underwriter's reputation. It is clear that the prestigious underwriter cares about his reputation and therefore he does have an incentive not only to avoid extreme underpricing but to underprice enough to achieve a successful public offering which will not damage his reputation and will satisfy the issuer as well leaving less money on the table for the flippers. This is contrary to the view of Cooney et al. (1999) who suggest that initial returns for a specific class of IPOs are positively related to the prestige of the underwriter in the nineties.

Finally, the coefficient of oversubscription is statistically different from zero at 1% level of significance providing thus significant explanatory power to the variable. In all the regressions undertaken, the coefficient of oversubscription was always statistically significant different from zero.

take in Table VII

VI. Concluding Comments

The underpricing of IPOs of stocks is recognized as one of the anomalies that challenges the Efficient Markets Hypothesis. This paper analysed the phenomenon of the underpricing of IPOs and its main determinants for the ASE, having as groundwork

the classification of the relative theories of underpricing. A large number of studies on the performance of IPOs suggests that underpricing exists in every stock market and also that on average investors purchasing IPOs at the launch price earn abnormal returns at the end of the first trading day.

Cross sectional data of 169 firms listed and traded on the ASE during the period 1997-2002 provide empirical evidence of the underpricing of IPOs. The first day adjusted return is 54.28% higher from any previous study for the ASE. Regarding the magnitude of underpricing, the results show, on average, an initial underpricing of 52.7% at the end of the first day, 44.78% at the end of the fifth day and 41.84% at the end of the first month. These results are highly significant and in line with the results of other international studies on emerging IPO markets. The downward trend in both raw and excess returns reported in this study is consistent with the findings of Kollintzas et al. (1996) and Kazantzis and Thomas (1996), who provide evidence that the rate of growing on the returns of investors is diminishing.

Moreover, we test the Beatty and Ritter's (1986) hypothesis of the prestigious underwriter and the relationship between underpricing and oversubscription. The results on the prestigious underwriter are in line with Beatty and Ritter's hypothesis, where the dummy variable used is significant and mitigates the magnitude of the phenomenon. Also, the variable of the power of oversubscription appears to be highly significant and under the assumption of leakage of information provides significant explanation of the phenomenon. The oversubscription is a pure signal to the investors that the share is underpriced. When investors realise ex ante that the offer price is too low, a large oversubscription for the firm's shares is observed.

Endnotes

[1] Setting as a criterion of comparison for IPOs returns the kind of market in which the new issues listed, we observe that the underpricing phenomenon follows the same patterns as in Table VI, but is more persistent in the Parallel and New Market of ASE than the Main Market. In the Main Market, the mean raw return of the first, fifth and twenty first day is 28.09%, 26.45% and 22.71% respectively, while in the Parallel Market is 61.19%, 59.37% and 54.82%. However, for the 5 IPOs in the New Stock Exchange Market the mean raw return of the first, fifth and twenty first day is 118.25%, 114.42% and 111.67% respectively.

References

- Allen, F. and G.R. Faulhaber (1989) "Signalling by Underpricing in the IPO Market." *Journal of Financial Economics*, 23, pp. 303-323.
- Almeida, M. and J. Dugue (2000) "Ownership Structure and Initial Public Offerings in Small Economies: The Case of Portugal." *Working Paper*, Universidade Technica de Lisboa.
- Arosio, R., G. Guidici and S. Paleari (2000) "What Drives the Initial Market Performance of Italian IPOs? An Empirical Investigation on Underpricing and Price Support." SSRN Working Paper (b).
- Beatty, R.P. and J.R. Ritter (1986) "Investment Banking, Reputation, and the Underpricing of Initial Public Offerings." *Journal of Financial Economics*, 15, pp. 213-232.
- Benviste, L. and P. Spindt (1989) "How Investment Bankers Determine the Offer Price and Allocation of New Issues." *Journal of Financial Economics*, 24, pp. 343-361.
- Booth, J. and R. Smith (1986) "Capital Raising, Underwriting and the Certification Hypothesis." *Journal of Financial Economics*, 15, pp. 261-281.
- Brennan, M. and J. Franks (1997) "Underpricing, Ownership and Control in Initial Public Offerings of Equity Securities in the U.K." *Journal of Financial Economics*, 45, pp. 391-413.

- Carter, R.B., F.H. Dark and A.K. Singh. (1998) "Underwriter Reputation, Initial Returns, and the Long- Run Performance of IPO Stocks." *Journal of Finance*, 53:1, pp. 285-311.
- Carter, R.B. and S. Manaster (1990) "Initial Public Offerings and Underwriter Reputation." *Journal of Finance*, 45 , pp. 1045-1067
- Chowdhry, B. and A. Sherman (1996) "International Differences in Oversubscription and Underpricing of IPOs." *Journal of Corporate Finance*, 2, pp. 359-381.
- Cooney, J.W, A. Singh, R.B. Carter and F.H. Dark (1999) "The IPO Adjustment Phenomenon and Underwriter Reputation." *Unpublished manuscript*, European Finance Association Conference, 25-28th August 1999.
- Derrien, F. and K. Womack (1999) "Auction vs. Book-Building and the Control of Underpricing in Hot IPO Markets." *Working paper*, Turku School of Business, Dartmouth College.
- Drake, P.D. and M.R. Vetsuypens (1993) "IPO Underpricing: Insurance against Legal Liability?" *Financial Management*, 22, pp. 64-73.
- Durukan, M. B. (2002) "The Relationship between IPO Returns and Factors Influencing IPO Performance: Case of Istanbul Stock Exchange." *Managerial Finance*, 28:2, pp. 18-38.
- Grinblatt, M. and C.Y. Hwang (1989) "Signalling and the Pricing of New Issues." *Journal of Finance*, 44, pp. 393-420.
- Jegadeesh, N., M. Weinstein and I. Welch (1993) "Initial Public Offerings and Subsequent Offerings." *Journal of Financial Economics*, 34, pp. 153-175.
- Jelic, R. and R. Briston (1999) "Hungarian privatisation Strategy and Financial Performance of Privatised Companies." *Journal of Business Finance and Accounting*, 26:9, pp. 1319-1357.
- Kazantzis, C. and M. Levis (1995) "Price Support and Initial Public Offerings: Evidence from the Athens Stock Exchange." *Research in International Business and Finance*, 12, JAI Press.
- Kazantzis, C. and C.D. Thomas (1996) "The IPO Puzzle and Institutional Constraints: Evidence from the Athens Stock Market." In: *Empirical Issues in Raising Equity Capital*, Levis, M. (ed.), pp. 81-94, New York and Oxford: Elsevier, North-Holland.

- Keloharju, M. (1993) "The Winner's Curse, Legal Liability, and the Long-Run Price Performance of Initial Public Offerings in Finland." *Journal of Financial Economics*, 34:2, pp. 251-277.
- Kollintzas, T., G. Sfakianakis and E. Tyligada (1996) "Underpricing and Oversubscription of the Public Offerings in the Athens Stock Exchange." *Working paper*, Foundation for Economic and Industrial Research, Greece.
- Leal, R. (1998) "Using Accounting Information in Prospectuses to Invest in Brazilian IPOs." *Working paper*, COPPEAD/ UFRJ.
- Ljungqvist, A. (1999) "IPO Undepricing, Wealth Losses and the Curious Role of Venture Capitalists in the Creation of Public Companies." *Working paper*, Said School of Business, Oxford.
- Loughran, T., J.R. Ritter and K. Rydqvist (1994, updated 2000) "Initial Public Offerings: International Insights." *Pacific-Basin Finance Journal*, 2, pp. 165-199.
- Otero, S. and A. Fernandez (2000) "Initial Public Offerings: The Spanish Case." *Working Paper*.
- Ritter, J. (1984) "The Hot Issue Market of 1980." *The Journal of Business*, 57:2, pp. 215-240.
- Ritter, J.R. (1991) "The Long-run Performance of Initial Public Offerings." *Journal of Finance*, 46, pp. 3-27.
- Rock, K. (1986) "Why New Issues are Underpriced." *Journal of Financial Economics*, 15, pp. 187-212.
- Tinic, S.M. (1988) "Anatomy of Initial Public Offerings of Common Stock." *Journal of Finance*, 43, pp. 789-822.
- Welch, I. (1992) "Sequential Sales, Learning and Cascades." *Journal of Finance*, 47, pp. 695-732.

Table I: International Empirical Results of Underpricing

Country	Study	Sample period	Number of Firms	Short-run returns (mean underpricing)
Belgium	Rogiers et al. (1993) ^a	1984-1999	69	15.7%
Brazil	Leal (1998)	1979-1992	66	74.1%
Canada	Jog and Srivastava ^a	1971-1992	258	5.4% ^b
China	Datar and Mao (1997) ^a	1990-1996	226	388% ^b
Finland	Keloharju (1993)	1984-1992	85	9.6%
France	Derrien and Womack (1999)	1992-1998	264	13.2%
Germany	Ljunqvist (1999)	1978-1999	407	27.7%
Greece	Kazantzis and Levis (1995)	1987-1991	79	48.5%
	Kazantzis and Thomas (1996)	1987-1994	129	51.7%
Hong Kong	Zao and Wu ^a	1980-1996	334	15.9% ^b
Hungary	Jelic and Briston (1999)	1990-1998	25	44%
Italy	Arosio, Guidici and Paleari (2000)	1985-2000	164	23,9%
Japan	Fukuda et al., Hamao et al. ^a	1970-1996	975	24% ^b
Korea	Dhatt et al., Choi and Heo ^a	1980-1996	477	74.3% ^b
Malaysia	Isa and Yong ^a	1980-1998	401	104.1%
Portugal	Almeida and Dugue (2000)	1992-1998	21	10.5% ^b
Singapore	Lee et al. ^a	1973-1992	128	31.4% ^b
Spain	Otero and Fernandez (2000)	1985-1997	58	12.8% ^b
Taiwan	Lin and Sheu ^a	1986-1995	241	34.6% ^b
Turkey	Durukan (2002)	1990-1997	173	14.61%
U.K.	Loughran et al. (1994, upd. 2000)	1959-1999	2802	13.9%
USA	Ibbotson et al. ^a	1960-1999	14376	17.4% ^b

Source: Various studies cited

^a Cited in Loughran et al. (1994, updated 2000).

^b First day raw return

Table II: Distribution of IPOs by Year and Market During 1997 – 2002				
Year	Number of IPOs	Main Market	Parallel Market	New Stock Exchange Market
1997	13	3	10	-
1998	24	9	15	-
1999	42	20	22	-
2000	48	15	33	-
2001	24	13	9	2
2002	18	6	9	3
Total	169	66	98	5
Source: Annual Reports of Hellenic Capital Market Commission and Annual & Monthly Statistical Bulletin of Athens Stock Exchange				

Table III: The Growth of the Greek Stock Market During 1997-2002 (amounts in millions of Euros)

Year	Value of transactions		Market Capitalization				Capital raised through IPOs		ASE General
	Amount	% change	Amount	% change	% of GDP	% of M3	Amount	% change	Index, % change
1997	17,081.4	-	28,793.3	-	29.6	47.1	59.0	-	58.5
1998	41,708.1	144.2	67,024.8	132.8	63.6	100.1	1,157.2	1,861.4	85.1
1999	173,027.0	314.9	197,537.0	194.7	169.4	172.8	1,840.0	59.0	102.2
2000	101,675.7	-41.2	117,956.3	-40.3	95.5	92.5	2,557.8	39.01	-38.8
2001	40,529.8	-60.1	96,949.5	-17.8	74.1	67.4	1,075.6	-137.8	-23.5
2002	24,771.0	-38.9	65,759.7	-47.4	46.9	48.2	92.5	-1,062.8	-32.5

Source: Athens Stock Exchange, Hellenic Capital Market Commission

Table IV: Correlation (OS,ER1) Matrix		
Variables	OS	ER1
Times of Oversubscription (OS)	1	0.799
Excess Returns of first day (ER1)	0.799	1

Table V: Times of Oversubscription of IPOs over the Period 1997-2002				
Year	Number of IPOs	Mean	Maximum	Minimum
1997	13	32.83	111.4	1.2
1998	24	105.11	337	1
1999	42	235.43	780	1,4
2000	48	116.48	753.5	1
2001	24	12.28	68,2	0.325
2002	18	19.64	85	0.7
1997-2002	169	89.96	355,85	0.9375
Source: Athens Stock Exchange, Hellenic Capital Market Commission				

Table VI: Results on the Initial Performance of IPOs					
<i>Raw Returns</i>					
Returns	Average Return	Standard Deviation	Number of Observations	Min Return	Max Return
Day 1	52.7%	1.013	169	-32.4%	463%
Day 5	44.78%	1.02	169	-69.6%	518%
Day 21	41.84%	0.939	169	-53.7%	608%
<i>Excess or Adjusted Returns</i>					
Day 1	54.28%	.997	169	-37%	465%
Day 5	45.32%	1.004	169	-62%	519%
Day 21	43.83%	.938	169	-48%	615%

Table VII: Regression Results on the Determinants of the Excess Returns of IPOs					
Dependent Variable	Independent Variable	Coefficient (St. error)	t- statistic	F-Statistic	Adj-R²
ER	Constant	6.74 (10.38)	0.682		
	Dummy (prestigious)	-28.58 (17.82)	-1.78*	33.61	0.697
	UNDWR	2.092 (1.073)	2.069**		
	OS	0.502 (0.071)	7.94***		
* Significant at the 10% level ** Significant at the 5% level *** Significant at the 1% level White's heteroscedasticity consistent estimates.					