Determinants of Stock Returns Subsequent to Initial Public Offerings

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This study addresses the following research question: Are the funds from the IPOs, which are intended for different uses, utilized efficiently? To answer this question the study regresses stock returns on the intended uses of the proceeds. The findings show a significant positive association of future stock returns with the investments in fixed assets and in working capital.

Key words: Initial Public Offerings, Stock Returns

***EFM* classification**: 200,330,710

I. Introduction

This study examines the implications of the mandatory disclosure of information on the intended uses of the proceeds from IPOs for stock returns subsequent to the public offering. This information on the proposed uses of the proceeds has a forward looking orientation and is expected to reveal to new investors the presence of positive net present value projects. The information on the intended uses of the proceeds is included in the prospectus of firms going public on the Athens Stock Exchange, which are examined in this study.

In the case of IPOs, an important research question is whether the proceeds are invested in such a way as to improve the operating performance of the firms going public. This research question is important because allows to assess the efficient utilization of the resources that the new stockholders have contributed. If the change in profitability is related to the proposed uses of the proceeds, the proposed uses of the proceeds will provide information about the long run stock returns of the IPOs.

Occasionally, firms involved in IPOs change the uses of the proceeds after the IPO because they do not find the investments that they had originally proposed to be profitable. This study examines whether the change in the proposed uses of proceeds provides new information to the stock market. This new information could be viewed as an indication of the inability of management to judge the profitability of the originally proposed projects but could also be due to the presence of new projects.

The contribution of this study is that examines whether the proposed uses of the proceeds are invested in such a manner as to increase long run returns subsequent to the IPO. In essence, this study examines the reliability of the budgeted information disclosed in the IPO prospectus to explain future stock returns.

The remainder of the paper is organized as follows: Section II discusses the prior literature, section III describes the institutional framework for IPOs in the Athens Stock Exchange, section IV discusses the models and the methodology,

section V presents the sample and data sources, section VI presents the empirical results and section VII has the conclusions of the study.

II. Literature Review

In the Initial Public Offerings (IPOs) literature, a significant number of studies examine the underpricing phenomenon, i.e., the presence of abnormal returns in the first trading day after the initial public offerings. These studies report that on average IPOs experience large positive first day returns. Existing explanations of the under pricing phenomenon include asymmetric information, signaling and agency theory arguments. There are also studies that examine the role of the auditor and underwriter reputation in the pricing of firms going public. Other studies have focused on investigating the prospectus earnings forecasts as a source of the underpricing phenomenon.

Another area of research has examined the operating performance of firms going public. Platt (1995), Hensler et al. (1997) and Jain and Kini (2000) have examined the usefulness of information contained in the IPO prospectus in explaining the subsequent operating performance of the firms. They focus on predicting post-issue survival. They find that specific firm characteristics are associated with the survival time of IPOs and that the involvement of venture capitalists improves the survival of IPO firms. Bhabra and Pettway (2003) study the relation between prospectus information and post-IPO financial and operating characteristics. They associate prospectus information with subsequent outcomes of mergers, seasoned equity offerings, financial distress and post issue stock performance. They find that financial and offering characteristics have a limited association with one year stock returns and that prospectus information is more useful in predicting survival/failure and not subsequent SEOs or acquisitions.

Jain and Kini (1994), investigate the change in operating performance of IPO firms from the pre to the post-issue period. They find evidence that IPO firms exhibit inferior post-IPO operating performance relative to the year prior to going public. This occurs in spite of the high growth in sales and capital expenditures over the period studied. They measure the change in operating performance as the median change of the operating return on assets and operating cash flows deflated by assets from the period before the IPO to the period after the IPO. In another study, Jain and

Kini (1999) develop a logit model using information available at or prior to the IPO to predict the post issue operating performance. The results indicate that there are several significant differences in the post-issue operating performance of surviving firms compared to non-surving. Mikkelson et al. (1997) examine the relation between the change in the ownership of common stock and the operating performance of companies going public. They find evidence that ownership stake declines significantly after going public. However, management ownership is unrelated to the operating performance of the IPOs. Operating performance has been measured as operating income scaled by total assets. The median ratio of operating income to total assets declines from the year prior to the year after the IPO.

Schultz (1993) examines the choice between unit and share IPOs. He finds evidence that equity financing though unit IPOs is a case where management can use the intended uses of the IPO proceeds to provide information about the firm's projects. In a subsequent study, Lee et al (2003) suggest that the planned uses of the proceeds reported on the prospectus cannot explain post listing failure rates for the different types of offerings.

Bae et al. (2002) focus on the investigation of the long run stock returns and the operating performance around firms' offerings of common stock, convertible bond and straight debt. The findings show that the common stock issuers experience the best pre-issue operating performance among all three types of issues but operating performance declines during the post issue period for common stock and convertible debt issuers. Moreover, that pre-issue abnormal returns are positive and significant for stock issuers while post issue returns are negative for common stock and convertible debt issuers.

Leone et al. (2003) examine the relation between the intended uses of the proceeds disclosed in the IPO prospectus and the underpricing anomaly. They provide significant evidence that increased specifity regarding the use intended uses of IPO proceeds is associated with lower underpricing. They report that this significant negative association is observed for IPO proceeds intended to be used for financing and investing activities, e.g. deleveraging, capital expenditures, research and development and not for operating activities such as advertising and marketing.

Jeanneret (2005) examines the long-run stock performance of French equity offerings with rights after controlling for the intended use of the proceeds and finds that firms specifying that the SEO proceeds will be spent either in internal growth projects or in

external growth opportunities underperform benchmark firms, while. firms raising equity for pure capital structure motives do not show any long run abnormal performance.

The objective of our study is to contribute to existing literature by examining the information content of the intended uses of the proceeds disclosed in the IPO prospectus in predicting the future profitability of the issuing firms. The indented uses of the proceeds provide information with forward orientation regarding investments in fixed assets, investments in working capital, investments in participations in other companies and for the payment of pre-IPO debt. The pre-IPO allocation of cash proceeds raised from the equity offering in future investment plans is expected to be related to post-issue long run performance.

III. Institutional Framework for IPOs

The prospectus is the primary source of information for the new investors in any IPO. Under Greek law, the leading underwriters as well as the management of the firm that goes public have the primary responsibility for providing in the prospectus all the information required by the capital market authorities and the securities laws.[1] Greek securities laws are very clear that the leading underwriter must exercise due diligence in determining the completeness and accuracy of the prospectus and in setting the offer price for the IPO. Moreover, the leading underwriter and the management of the firm going public are jointly liable to new investors for any losses they may suffer if investors can prove to the courts that these losses were caused by information missing from the prospectus or by inaccurate information included in the prospectus and used in the determination of the offer price.

Greek IPO prospectuses focus primarily on forward-looking information developed by the analysts of the lead underwriter with help from the management of the firm going public. Management provides valuable inside information about the future prospects of the firm that is used in turn by analysts in generating earnings forecasts and the underwriter in setting the offer price. The prospectus includes, among other items, the financial statements of the IPO firm along with the auditor's

opinion, a detailed financial analysis of the reported financial statements, the analysts' earnings forecast, a detailed description of the firm and the industry in which it operates and budgets indicating the use of the proceeds from the IPO.

Furthermore, after the year 2000 the capital market authorities decided to request the disclosure of additional post -IPO information, regarding the revision in the use of funds raised from IPO (ASE B. D. decision 34/5-11-2000).

IV. Models and Methodology

This section presents the model used to examine the association of future stock returns with the intended uses of IPO proceeds as referred in the IPO prospectus.

The model that explain future returns take the following form:

$$SR_{t+i} = 1/MV + \alpha_1 MR_{t+i} + \alpha_2(FE_{t+i-1} - RE_{t+i-1}/ RE_{t+i-1}) + \alpha_3 FA/MV + \alpha_4 INV/MV + \alpha_5 WC/MV + \alpha_6 DEBT/MV + \varepsilon \quad (1)$$

Where:

SR_{t+i} : is the firm stock return for the time intervals of 22 , 126, 252 and 504 days after the IPO. Stock returns are calculated as P_t _ Offer Price/ Offer Price.

MR_{t+i} : is the market return of the Athens Stock Exchange general index.

FE_t : is the forecast of earnings for the year in which the IPO occurs.

FA/MV : IPO proceeds designated for investment in fixed assets divided by the market value of equity.

INV/MV : IPO proceeds designated for investments in participations in other companies divided by the market value of equity.

WC/MV : IPO proceeds designated for investment in working capital divided by the market value of equity.

DEBT/MV : IPO proceeds designated for the payment of pre-IPO debt divided by the market value of equity.

[1] Presidential Decree 350/1985

MV : the market value of equity calculated as the number of total shares in year t multiplied by the offer price.

Furthermore, the study attempts to explain stock returns when the firm announces a revision of the originally intended use of the proceeds by estimating the following regression model:

$$SR_{t+i} = 1/MV + \alpha_1 MR_{t+i} + \alpha_2 \Delta FA/MV + \alpha_3 \Delta INV/MV + \alpha_4 \Delta WC/MV + \alpha_5 \Delta DEBT/MV + \varepsilon \quad (2)$$

Where:

SR_{t+i} : are the firm's cumulative daily raw returns over the window of [–1, +1] days around the decision date "zero". Date "zero" is the date on which the shareholders' general meeting decided the revision of the IPO proceeds.

MR_{t+i} : is the market return of the Athens Stock Exchange general index.

ΔFA : is the change in the IPO proceeds designated for investments in fixed assets.

ΔINV : is the change in the IPO proceeds designated for investments in participations in other affiliates.

ΔWC : is the change in the IPO proceeds designated for investments in working capital .

$\Delta DEBT$: is the change in the IPO proceeds designated for the payment of pre-IPO debt.

MV : the market value of equity calculated as the number of total shares in day "zero" multiplied by the stock price . Day "zero" is the day on which the shareholders' general meeting decides the revision of the IPO proceeds.

The change in the initial IPO proceeds is calculated as: IPO use of proceeds designated in the prospectus minus IPO use of proceeds designated by shareholders in the annual general meeting.

V. Sample and Data Sources

This section presents the sample and data used in this study. The sample consists of 235 IPOs of firms listed on the Athens Stock Exchange during the 1987-2002 period. During the same period the total number of IPOs that took place at the ASE was 280[2]. Table 1 shows the sample selection procedure that resulted in the reduction of the sample.

Insert Table 1 about here

Stock returns for the sample firms were retrieved from the ASE database and are adjusted for stock splits and stock dividends. Information on the intended uses of IPO proceeds and other financial information was hand collected from the IPO prospectuses. Financial information for the years after the IPO was retrieved from publicly available financial statements. Table 2, panel A, reports the univariate statistics for stock returns and market returns. Table 2, panel B, presents the univariate statistics for the variables on the designation of the IPO proceeds. The mean (median) value of gross proceeds derived from the IPOs are 14,922 (5,851) thousands of euros, while the mean (median) value of the issuing offer price is 4.15 (2.8) euros. The market value of equity at offer prices, is 80,510 (12,685) thousand euros. Observing the statistics for the intended uses of the proceeds variables we notice that investments in fixed assets (FA) and working capital needs (WC) have the highest mean, median and interquartile range. The amount of capital designated for the investments in participations in other companies (INV) and for payment of pre-IPO debt (DEBT) is less than the amounts designated for investments in fixed assets and for investments in working capital.

Insert Table 2 about here

Table 3 presents the 104 IPO revisions[3]. From the original sample of 198 IPOs, 104 IPO firms revised the designated uses of the public offering proceeds.

9

[2] Banks, insurance, leasing and investment companies have been excluded from the sample.

Insert Table 3 about here

VI. Empirical Findings

This section reports the empirical findings of the study. Multivariate regression models have been estimated by using OLS. The reported t-statistics for all the regression models have been estimated using White's (1980) heteroskedasticity-consistent covariance matrix. Outlying observations were detected by using Cook's D Statistic as suggested in Belsley, Kuh and Welsh (1980)[4].

Future Returns

The future returns analysis involves the regression of future stock returns on the intended uses of IPO proceeds. In model (1), as defined in previous section, we test the explanatory ability of the intended uses of the proceeds for long-horizon future stock returns. The predictive ability of the potential use of the proceeds on future stock returns will be greater when longer time intervals are used because some time is required for the investment of the proceeds in different projects. The time intervals that we use are 22, 126, 252 and 504 post-issue trading day. Table 4 reports the regression results of the return models. The results show a significant and positive association between IPO proceeds designated for investment in fixed assets (FA) and future stock returns for the one month, six months and twelve months time horizon. This significant association holds also for the investments in working capital (WC) and the amount of capital designated for payment of pre-IPO debt (DEBT) as well for the 22,126 and 252 trading days. The designation of the IPO proceeds for investments in fixed assets and in working capital has a positive predictive ability with respect to future stock returns. The return of the market variable (MR) is also proved to be significant in all our models regardless of the time horizon. Finally, the relation between IPO proceeds designated for the payment of pre-IPO debt (DEBT) and future stock returns is only significant in the six months and twelve months time horizon and

[3] The change in the intended uses of the IPO proceeds was hand collected from the Athens Stock Exchange database, which includes all the disclosures, made by firms.
[4] two outlying observation were detected leading us to the reduction of the sample to 196 observations

is not as strong as for the proceeds designated for investments in fixed assets or working capital needs. Overall, our evidence is consistent with the interpretation that future stock returns are driven by firms' investing decisions expressed as a function of the use of the proceeds. A firm's disclosure on the designation of the use of IPO proceeds reveals relevant information and this information is incorporated into future stock returns. The results from this analysis are very similar to the regression results on the future earnings regressions.

Insert Table 4 about here

Table 5 presents pairwise Pearson correlations for the future stock returns and the designated uses of IPO proceeds variables. The correlations observed among the various regression variables used in the study are not particularly high.

Insert Table 5 about here

Stock Return Effect of the Revision of the IPO Proceeds

To provide an initial analysis of the decision to revise the uses of the proceeds on stock returns, the study calculates raw returns for windows of [–1, +1] around the revision date. The event date is the date that the shareholders' general meeting decided a revision of the IPO proceeds. Table 6 reports the empirical findings. The mean cumulative raw return is positive for both samples i.e. IPOs with only one revision (n=64) and IPOs with two revisions (n=95). For the sample of IPOs with one revision the 3-day window raw return is 1.15% and statistically significant at 10% while, for the sample with two revisions the stock return is 0.73%.

Insert Table 6 about here

The study further investigates the association between event period [-1+1] returns and the change in the designated uses of the IPO proceeds that was decided at the shareholders annual meeting. The study finds evidence that the returns are negatively associated with the change in the funds used for investments in fixed assets

(ΔFA) and with the change in the funds invested in other affiliates (ΔINV). The decision to revise the use of the proceeds provides negative information to the investors regarding the value of the firm. Firms' choices to reduce these investments suggest that unprofitable projects will be undertaken.

Insert Table 7 about here

VII. Conclusion

This study investigates the relation between the intended uses of IPO proceeds and long-run stock returns of firms going public at the Athens Stock Exchange. We find that investments in fixed assets and investments in working capital are positively associated with post-IPO stock returns. Furthermore, the study explores investors' reactions on information releases about the revision of the designation of the IPO cash proceeds. Decisions regarding changes in the uses of IPO proceeds regarding investments in fixed assets and in other affiliates are negatively related to the value of the firm.

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Table 1

Sample Selection Procedure

IPOs in the ASE during the 1987-2002 period	280
Not having available the prospectus	(45)
Firms with unavailable financial information	(18)
Firms with unavailable stock returns	(15)
Mergers or Acquisitions	(4)
Sample Firms	198

Table 2
Descriptive Statistics on Stock Returns and Market Returns
Panel A

Variables	Mean	25%	Median	75%	Std.Dev
SR_{22}[2]	0.711	-0.003	0.274	0.979	1.333
SR_{126}[2]	0.903	-0.082	0.206	1.046	2.151
SR_{252}[2]	1.003	-0.182	0.212	0.916	2.777
SR_{504}[2]	0.979	-0.456	0.041	1.055	3.545
MR_{22}[3]	0.011	-0.066	-0.009	0.071	0.119
MR_{126}[3]	0.004	-0.171	-0.062	0.051	0.267
MR_{252}[3]	0.021	-0.306	-0.074	0.135	0.404
MR_{504}[3]	0.106	-0.463	-0.050	0.390	0.708

Panel B
Descriptive Statistics on the Use of Proceeds

Variables	Mean	25%	Median	75%	Std.Dev
FA/MV	.4081	.0952	.2123	.4866	.6624
INV/MV	.0559	0	0	.0263	.2085
WC/MV	.2062	0	.0608	.2355	.3892
DEBT/MV	.1051	0	0	.1180	.2697
Gross proceeds[1]	14,922.02	2,357.136	5,851.064	13,580.98	30,459.82
MV at offer prices[1]	80,510.53	4,059.158	12,685.68	38,937.31	347,553.1
Offer Price	4.151	0.976	2.799	5.033	5.020

Definitions of the variables:
[1] In thousands of euros
[2] is the firm stock return for the time intervals of 22, 126, 252 and 504 days after the IPO. Stock returns are calculated as P_t – Offer Price/ Offer Price
[3] is the market return for the time intervals of 22, 126, 252 and 504 days after the IPO. Market returns are calculated as MR_{it} – MR_{it-1} / MR_{it-1}
FA : IPO proceeds designated for investments in fixed assets
INV : IPO proceeds designated for investments in participations in other affiliates
WC : IPO proceeds designated for investments in working capital
DEBT: IPO proceeds designated for the payment of pre-IPO debt
MV : is the market value of equity calculated as the number of total shares in year t multiplied by the offer price

Table 3

IPO Revisions

IPOs with at least one revision of the intended uses of the proceeds	104
IPO revisions without a specific date for the assembly of the stockholders	(6)
IPOs with two or more revisions of the intended uses of the proceeds	(16)
IPO revisions with internal change in the designation of the proceeds	(18)
IPOs with a single revision of the intended uses of the proceeds	64

Table 4

The Regression Model

$$SR_{t+i} = 1/MV + \alpha_1 MR_{t+i} + \alpha_2(FE_{t+i-1} - RE_{t+i-1}/ RE_{t+i-1}) + \alpha_3 FA/MV + \alpha_4 INV/MV + \alpha_5 WC/MV + \alpha_6 DEBT/MV + \varepsilon$$

Variables	22 trading day	126 trading days	252 trading days	504 trading days
1/MV	-105.286	-115.372	-120.531	-137.639
	(-3.11)***	(-2.94)***	(-2.46)**	(-1.38)
MR	2.834	4.643	4.140	2.622
	(3.07)***	(4.14)***	(4.41)***	(3.53)***
$FE_{t+i-1} - RE_{t+i-1}/ RE_{t+i-1}$	0.015	0.018	0.006	0.001
	(1.44)	(0.96)	(0.29)	(0.22)
FA/MV	0.566	0.678	0.642	1.060
	(2.57)**	(2.89)***	(2.08)**	(1.57)
INV/MV	-0.439	-0.229	-0.020	-0.018
	(-0.72)	(-0.33)	(-0.03)	(-0.02)
WC/MV	0.988	0.965	1.096	0.547
	(2.37)**	(2.62)***	(2.02)**	(1.04)
DEBT/MV	0.218	0.623	0.640	0.013
	(1.43)	(2.89)***	(1.84)*	(0.02)
F-statistic	9.19***	6.89***	6.46***	4.18***
Adjusted R^2	0.20	0.33	0.38	0.31

Definitions of the variables:
FA : IPO proceeds designated for investments in fixed assets
INV : IPO proceeds designated for investments in participations in other affiliates
WC : IPO proceeds designated for investments in working capital
DEBT: IPO proceeds designated for the payment of pre-IPO debt
RE_{t-1} : is the firm's reported earnings for the year prior to the IPO
FE_t : is the forecast of earnings for the year end in which the IPO occurs
MV : the market value of equity calculated as the number of total shares in year t multiplied by the offer price
*** Statistical significant at the 1% level of significance
** Statistical significant at the 5% level of significance
* Statistical significant at the 10% level of significance

Table 5
Correlation Coefficients of Return Models

	SR_{22}	SR_{126}	SR_{252}	SR_{504}	$FE_t - RE_{t-1} / RE_{t-1}$	FA/MV	*INV/MV*	*WC/MV*	DEBT/MV
SR_{22}	1								
SR_{126}	.522***	1							
SR_{252}	.432***	.628***	1						
SR_{504}	.253***	.278***	.445***	1					
$FE_t - RE_{t-1} / RE_{t-1}$	.031	.017	.032	.006	1				
FA/MV	.074	-.016	.028	.094	.048	1			
INV/MV	-.071	-.067	-.022	-.005	.032	.007	1		
WC/MV	.169**	.022	.045	.059	.037	.491***	.109	1	
DEBT/MV	-.119	-.053	-.024	-.013	.033	.093	.099	-.111	1

Definitions of the variables:
FA : IPO proceeds designated for investments in fixed assets
INV : IPO proceeds designated for investments in participations in other affiliates
WC : IPO proceeds designated for investments in working capital
DEBT: IPO proceeds designated for the payment of pre-IPO debt
RE_{t-1} : is the firm's reported earnings for the year prior to the IPO
FE_t : is the forecast of earnings for the year in which the IPO occurs
MV : the market value of equity calculated as the number of total shares in year t multiplied by the offer price
***. Correlation is significant at the 1% level (2-tailed).
** . Correlation is significant at the 5% level (2-tailed)

Table 6
Cumulative Raw Returns around Date to Revise the Uses of the Proceeds

Return window	Number of Obs.	Mean	25%	Median	75%	Std Dev	t-statistic for the mean
[−1, +1]	n=64	.0115	-.0162	.0022	.0396	.0531	1.728*
[-1, +1]	n=95	.0073	-.0293	-.0022	.0303	.0595	1.201

Definitions of the variables:

SR[-1+1] : the cumulative raw returns for a 3 days window around the date in which the assembly of the stockholders decided the revision of the intended uses of the IPO proceeds

Table 7

The Regression Model

$$SR_{t+i} = 1/MV + \alpha_1 MR_{t+i} + \alpha_2 \Delta FA/MV + \alpha_3 \Delta INV/MV + \alpha_4 \Delta WC/MV + \alpha_5 \Delta DEBT/MV + \varepsilon$$

	(n=64)	(n=95)
Variables	SR[-1+1]	SR[-1+1]
1/MV	0.410 (3.16)***	0.334 (2.60)***
MR	1.328 (3.78)***	1.760 (5.24)***
ΔFA/MV	-0.003 (1.76)*	-0.0003 (-0.97)
ΔINV/MV	-0.004 (-2.28)**	-0.001 (-1.91)*
ΔWC/MV	-0.002 (1.44)	-0.0001 (-0.38)
ΔDEBT/MV	-0.003 (-1.53)	0.0004 (0.86)
F-statistic	7.55***	7.94***
Adjusted R^2	0.46	0.37

Definitions of the variables:

SR[-1+1] : the cumulative raw returns for a 3 days window around the date in which the assembly of the stockholders decided the revision of the intended uses of the IPO proceeds

ΔFA : Change in the IPO proceeds designated for investments in fixed assets calculated as : Initial IPO proceeds designated for investments in fixed assets – Revised IPO Proceeds designated for investments in fixed assets.

ΔINV : Change in the IPO proceeds designated for investments in participations in other companies calculated as : Initial IPO proceeds designated for investments in participations in other companies – Revised IPO Proceeds designated for investments in participations in other affiliates.

ΔWC : Change in the IPO proceeds designated for investments in working capital calculated as : Initial IPO proceeds designated investments in working capital – Revised IPO Proceeds designated investments in working capital.

ΔDEBT: Change in the IPO proceeds designated for the payment of pre-IPO debt calculated as : Initial IPO proceeds designated for the payment of pre-IPO debt – Revised IPO Proceeds designated for the payment of pre-IPO debt.

MV : the market value of equity calculated as the number of total shares in date "zero" multiplied by the stock price . Date "zero" is the date on which the shareholders' general meeting decided the revision of the IPO proceeds.

*** Statistical significant at the 1% level of significance
** Statistical significant at the 5% level of significance
* Statistical significant at the 10% level of significance