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Detecting 'Window Dressing' Behavior Among Firms That Go Public in the Athens Stock Exchange

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Abstract

This paper uses income-smoothing methodology in order to examine whether the existence of window dressing behavior affects the operating and market performance of firms that go public in the Athens Stock Exchange (ASE). The results depict that the window dressing behavior is unpopular among Greek IPO firms. The after-market performance of IPO firms in Greece reveals that issuers use underpricing as a means to signal their quality to the market. In addition, the findings posit that investors do not over-react to past earnings growth and that the window dressing assumption is unable to explain the post-issue performance of IPO firms in Greece. Finally, the results indicate that the market exhibits the ability to anticipate intentional income-smoothing behavior and classifies smoothing firms to higher risk classes.

Key words:

IPOs, under-performance, income smoothing, over-reaction to past earnings growth.

1. Introduction

The long-term operating and market performance of Initial Public Offerings (IPOs) has been a quite puzzling topic of research in corporate finance. Many studies in the area report results, which are not always consistent even

when they are based upon data sets from the same or similar institutional environments.

In particular, some findings posit that prior to going public, IPO firms exhibit increasing rates of earnings growth. In the post-IPO period, however, earnings growth tends to mean revert and the performance of IPO firms deteriorates over time. The findings also suggest that the declining operating performance of IPO firms cannot be attributed to the lack of opportunities for sales growth or to cutbacks in post-IPO capital expenditures (Patel *et al.*, 1993; Jain and Kini, 1994; Pagano *et al.*, 1998).

Additional results depict that the IPO firms deliver high stock returns in the early post-IPO period. However, the initial high returns gradually deteriorate and thus the long-run performance of IPOs displays a declining pattern (Ritter, 1991; Jain and Kini, 1994; Loughran and Ritter, 1995; Dharan and Ikenberry, 1995; Dewenter and Malatesta, 1997).

Finally, Jain and Kini find that operating performance relates to ownership control, in the sense that IPO firms where entrepreneurs retain higher ownership generally demonstrate superior performance as compared to other issuing firms.

The explanation provided for these results has come to be known as the 'window dressing hypothesis' and states that managers attempt to window-dress their accounting numbers prior to going public. Therefore, the pre-issue operating performance of IPO firms is overstated as compared to the post-IPO performance. On the other hand, the market does not understand that earnings growth tends to mean revert and investors are constantly surprised by the poor post-issue operating performance of IPO firms. As the market gradually recognizes its mistakes, the over-reaction to past earnings growth (the high initial returns) is corrected slowly in the future and the stock price performance of IPO firms deteriorates over time (Jain and Kini, 1994). This explanation has also been shown to have an empirical content by Teoh *et al.* (1998a) who evidence that opportunistic (discretionary) earnings management in the IPO year relates to the poor market performance in the post-IPO period.

This perceived market anomaly has gained some support among researchers. However, its generalizability has been questioned by some relatively recent empirical findings. In particular, Mikkelson *et al* (1997) and Beaver *et al* (2000) fail to document declining operating performance patterns in the post-IPO period. Moreover, Mikkelson *et al* find that the operating performance is unrelated to ownership control. On the other hand, Beaver *et al* show that the existence of earnings management around IPO years cannot be attributed to discretionary behavior of management over accruals. What they believe is that the decision to go public is related to factors, such as peak in sales and high earnings growth. These factors may cause a firm's

accruals to appear extreme and thus signal the existence of earnings management. Finally, Brav and Gompers, (1997) and Fama (1998) show that the market under-performance phenomenon is not an exclusive IPO effect but applies also to small-size and low book-to-market firms irrespective of whether they are IPO firms or not.

The present paper expands on the findings of the above mentioned studies and elaborates on the long-run operating and market performance of IPO firms in Greece. In particular, the paper examines whether Greek IPO firms display intentional window dressing behavior both in the pre-IPO and in the post-IPO period. In addition, the paper looks into the impact of window dressing behavior on both the operating and market performance of IPOs in Greece. Finally, the paper tests whether the operating performance of IPO firms plays any role in determining market performance and whether additional factors such as firm-size and book-to-market ratios help explaining the evolution of the long-run market performance of IPO firms in Greece.

The paper uses a data set of 38 IPOs made in Greece during the three-year period from 1-1-1990 to 31-12-1992. The variable set consists of financial statement information and share price information over a ten-year period, which plots around the actual IPO year (four years prior and five years after the actual IPO year). For simplicity, window dressing behavior is replicated by income smoothing which in the relevant literature prevails as a form of earnings management[1]. Sample firms are classified as income smoothers and non-smoothers using the methodology prescribed in Michelson *et al.* (1995). The impact of apparent window dressing behavior on the evolution of operating and stock price performance of IPO firms is then assessed by testing for differences in the mean values of the variables employed between the two sub-samples.

The results of the present paper depict that the window dressing hypothesis is unable to explain the evolution of operating and market performance of IPO firms in Greece. In particular, it is found that smoothing behav-

[1] In reviewing the relevant literature Dechow *et al.* (1995) acknowledge that the models developed for the detection of earnings management suffer the disadvantage of the lack of a proper definition for discretionary accruals. On the other hand, income smoothing is simply detected by comparing earnings variability to sales variability without having to classify accruals into discretionary and non-discretionary. Schipper (1989) categorizes income smoothing as a special case of earnings management but recognizes that some of the incentives that give rise to income smoothing apply equally to any form of earnings management. Therefore, a reasonable assumption made in the paper is that firms that attempt to smooth their earnings have incentives for earnings management. However, a limitation of this approach is that there may be some companies that engage in other forms of window dressing not detected by income smoothing methodology.

ior is not quite popular among Greek IPO firms. Pre-IPO profitability margins are sustained in the post-IPO period irrespective of whether firms display or not smoothing behavior. Moreover, the results indicate that there are no statistically significant differences in the mean values of operating and market performance measures of smoothing and non-smoothing firms. On the other hand, the results reveal that the market performance of smoothing firms is more volatile than the respective of non-smoothing firms implying that the market is able to recognize smoothing behavior and categorizes smoothing firms into higher risk classes. Further results indicate that there are no differences in the size of the sample firms and in the values of the market-to-book ratio relating to income-smoothing behavior. Finally, it is shown that the changes in the operating performance have some information content for changes in the market performance of IPO firms. In this context it is also found that income smoothing, firm-size and market-to-book ratios display incremental explanatory power and thus are important in explaining the long-run stock price performance of IPO firms in Greece.

The results of the paper appear to be interesting and bear implications for investors, managers and regulators. First, in the light of the recent upgrading of the Athens Stock Exchange (ASE) from an emerging to a mature market, the Greek capital market has attracted the attention of many European and international institutional and individual investors. The present paper casts new light on the long-run performance of IPOs in Greece and therefore the results may of interest for European and international investors who consider investing in the ASE.

Second, the results of the paper, along with the previous evidence on the performance of IPOs in Greece, show that empirical results derived from the US and UK institutional environments do not always apply to smaller and less developed markets. For example, previous Greek studies by Papaioannou and Travlos (1995), Tsetsekos (1995), Papaioannou *et al.* (1997), Travlos (1997) and Papachristou (1998) report results, which do not fully support the window dressing hypothesis. In particular, these studies suggest that the high initial returns delivered by IPO firms in Greece prevail because of systematic underpricing and not because of any over-reaction to past earnings growth. Moreover, Papaioannou *et al.* (1997), Travlos (1997) show that in the post-IPO period Greek firms maintain pre-IPO profit margins and they perform relatively well as compared to the market and to their industry counterparts.

Third, the paper provides direct evidence on income smoothing by Greek IPO firms. Although the findings of the previous Greek studies lean towards the perception that intentional window dressing behavior is unpopular among IPO firms, the lack of direct evidence on earnings management in Greece makes it difficult to assert that Greek IPO firms do not involve in window

dressing practices. Moreover, there are cases where certain events occasionally signal window dressing behavior, especially to international investors who are unfamiliar with the Greek business environment. An example could be the case where a Greek firm applies for listing on a foreign market. In particular, some Greek firms decide to follow US GAAP in addition to the required Greek GAAP in order to gain the US SEC's approval to list their shares on the New York Stock Exchange (NYSE). The prevailing difference in earnings under the two accounting systems can be thought as evidence of earnings management. Thus, US investors may not only be reluctant to hold shares of Greek firms but also they may exercise pressure to the SEC in order to impose more strict requirements for the listing of Greek firms on NYSE.

The remainder of the paper is organized as follows. Section II describes the data set, develops the hypotheses to be tested and elaborates on some methodological issues. Section III presents the empirical results and analyzes their implications for investors, managers and regulators. Section IV summarizes the major conclusions and expands on their implications for future research.

2. Data and methodology

2.1. The data set

The present paper examines a total of 38 new listings of industrial and commercial firms on the main and the parallel market of the Athens Stock Exchange (ASE) during the three-year period from 1-1-1990 to 31-12-1992. The data set consists of financial statement information and share price information over a ten-year period, which plots around the actual IPO year (four years prior and five years after the actual IPO year). Data are collected from two different sources. For the pre-IPO period, which consists of four years, data are extracted from the initial offering prospectuses. For the post-IPO period, which consists of the issuing year and five years hence, data are collected from the annual editions of the ASE.

For each firm in the sample and for the entire ten-year period a set of financial variables is calculated. These include net sales (NS), gross profit (GP), net operating profit after taxes (NOPAT), net profit (NP) and the ratio of NOPAT to net sales (NOPAT/NS) which is used as a measure of operating performance The decision to use net sales instead of total assets as the denominator of this ratio is motivated by the studies of Papaioannou et al., (1997) and of Travlos (1997) who employ similar measures of operating performance. In these articles total assets are excluded because of fixed assets

revaluation, which makes unadjusted total assets difficult to compare across years.

Share price information is available for a six-year period consisting of the IPO year and the subsequent five-year period. The variables falling in this category include the ratio of the market value of equity to the book value of equity (MVE/BVE), the size of the firms which is measured as the total capitalization (share price times number of shares outstandidng) and the ratio of normalized excess value (NEV). MVE/BVE is used by Jain and Kini (1994) and by Travlos (1997) not only to explore the market performance of IPO firms but also to detect IPO underpricing. NEV is calculated as the difference between the firm's market value and its book value of total assets (denoted as Excess Value, EV) divided by the amount of net sales. The market value of the firm is measured as the sum of the book values of total debt and preferred stock plus the market value of common equity. As Philippatos and Baird, III (1996) state, EV represents the capitalized value of the expected stream of future excess profit or loss arising when the fair market price of the company differs from the average value of the capital employed. EV is normalized by net sales in order to account for differences in size and the resulting ratio is denoted as NEV. This variable is used as a market performance measure and is prefered over stock returns because it complies with value-based management.

Some of the studies in the area examine whether changes in ownership structure affect the operating and market performance of the companies that go public. Changes in the ownership structure of a company are frequently measured by a variable, which refers to the after-market percentage of ownership maintained by the stockholders who controlled the company prior to the IPO. This variable is oftenly denoted as ALPHA. In the context of the present study the same notation is also employed, and ALPHA is calculated for a six-year period indicating the changes in the ownership structure of each sample company resulting from subsequent issues of stock in the post-IPO period.

In calculating all variables the IPO year of every sample company was thought as year 0 and the time horizon of the study was plotted around this year. For example, the NOPAT/NS variable was calculated for a period of four years prior to year 0 and for five years after (from year –4 to year +5). The rest of the variables, which concern market performance, were calculated for a six-year period, which consists of the IPO year and the five-year period following the IPO year (from year 0 to year +5).

2.2. Detecting Income Smoothing

Income smoothing has been defined as the dampening of fluctuations about some level of earnings that is considered to be normal for a firm (Beidleman, 1973; Barnea et al., 1976; Belkaoui and Picur, 1984; Lambert, 1984; and Albrecht and Richardson, 1990). Many empirical studies assert that income smoothing is motivated by a desire of firms to enhance the predictability of future earnings. This explanation is justified by two distinct but not unrelated views. The first view states that management uses smoothing practices in order to maximize its utility and in order to convey its expectations to the users of financial statements (Barnea et al., 1976; Lambert, 1984; Moses, 1987; Beattie et al., 1994; and Carlson and Bathala, 1997). The second view asserts that management considers fluctuations in income and unpredictable earnings to be the causal determinants of systematic risk (Lev and Kunitzky, 1974; Trueman and Titman, 1988; Beattie et al., 1994; Michelson et al., 1995; and Booth et al., 1996).

One approach to study the existence of income smoothing is by comparing the variability of various definitions of income to the variability of sales. This method was initiated by Eckel (1981) and has also been employed in a number of subsequent studies (Albrecht and Richardson, 1990; Michelson et al., 1995; Booth et al., 1996; and Carlson and Bathala, 1997). Under this approach a firm is classified as an income smoother if the ratio:

$$\frac{CV\ (\Delta I_t)}{CV\ (\Delta S_t)} \leq 1$$

Where: CV = coefficient of variation (standard deviation/expected value) calculated over the entire ten year period.
ΔI_t = change in income from period t-1 to period t, and
ΔS_t = change in sales from period t-1 to period t.

Michelson et al., (1995) use various definitions of income in order to identify different smoothing instruments and result in three different models of detecting income smoothing. A variant of this approach is also followed here, by using three different definitions of income: gross profit (GP), net operating profit after taxes (NOPAT) and net profit (NP). With three definitions of income the smoothing ratio can be calculated in three different ways. Therefore, sample firms can be categorized as income smoothers and non-smoothers under three different models:

Model 1: A firm is classified as an income smoother if at least one of the three smoothing ratios lies between zero and one.

Model 2: A firm is classified as an income smoother if at least two of the three smoothing ratios lie between zero and one.

Model 3: A firm is classified as an income smoother if all three smoothing ratios lie between zero and one.

It is evident that by moving from model 1 to model 3 the conditions for classifying a firm as an income smoother become more restrictive. The intuitive appeal of this method is that if smoothing is a common practice among sample firms, the number of smoothers can be reduced to those that systematically engage in income smoothing by moving from one model to another that is by setting more restrictive requirements.

2.3. Methodological Approach

The methodological approach followed in the present paper goes down two paths. The first path concerns the evolution of the performance of IPO firms over the selected time horizon, and the question as to whether there are any systematic differences in the average performance of income smoothers and non-smoothers. Moreover, prevailing differences are compared to differences in size, MVE/BVE and ALPHA in order to assess potential interrelations among variables. Having classified sample firms into smoothers and non-smoothers summary statistics are obtained for each one of the two subsamples and for the original sample as a whole. In particular, T-tests and F-Tests are performed in order to investigate whether the variables computed for smoothers and non-smoothers present significant differences in the mean values and in the variance respectively. This approach enables to recognize whether firms gain advantages from involving into smoothing activities and whether the market properly accounts for this behavior.

The second path uses regression analysis to examine whether changes in the market performance of IPO firms are driven by changes in the operating performance and by the firms' smoothing behavior. In this context, six additional variables are utilized: ΔNEV, which represents the one-period change in NEV; ΔPERF, which represents the one-period change in the ratio of NOPAT/NS; ΔALPHA, which represents the one period change in ALPHA; ISM, which is a dummy variable for income smoothing that takes the value of 1 when the firm is classified as an income smoother, and 0 otherwise; MB, which is a dummy variable that takes the value of 1 for high MVE/BVE (low BVE/MVE) firms and zero otherwise; and SIZE, which is a dummy variable for size that takes the value of 1 for small size firms (below median capitalization) and the value of 0 otherwise. The various regression models run have ΔNEV as their dependent variable. The rest of the variables described are

used as explanatory variables and vary across the models. The three dummy variables are multiplied by ΔPERF in order to assess their incremental information content for ΔNEV over ΔPERF.

The purpose of the regression analysis is to see whether income smoothing affects the performance of IPOs in the market and whether changes in NEV create incentives for managers to involve in window dressing practices. Moreover, the regression analysis reveals whether firm-size and book-to-market ratios explain the performance of IPOs in the market and whether their explanatory power encompasses the respective of income smoothing. Finally, the regressions performed help explaining whether and to which extend the market's pricing mechanism adjusts in the post-IPO period for continuing smoothing behavior.

3. Analysis of the Results

3.1. Findings on Income Smoothing

The three alternative smoothing ratios described in the previous section are calculated for all sample firms and over the entire ten-year period. The results indicate that income smoothing is not very popular among Greek firms. Less than one third of the sample firms (12 out of 38 companies) are found to classify as smoothers under Model 1, only three companies under Model 2, and just one company under Model 3. Moreover, it is found that ten out of the twelve firms that qualify as income smoothers under Model 1 prefer to smooth gross profit rather than any other definition of income. This latter finding bears important implications for the factors that motivate Greek firms to engage in income smoothing. Clearly it appears that reducing the variability in operating or net earnings cannot be thought as the strongest incentive for earnings management in Greece. Given that the Greek accounting system is tax oriented, a potential incentive for earnings management could be the reduction or the deferring of tax obligations. The finding that gross profit prevails as the most preferred smoothing instrument indicates that Greek firms try to reduce the variability in sales and cost of goods sold potentially in order to smooth periodic VAT payments. Thus, a preliminary implication of the present paper is that the Greek IRS should enforce a tax audit system that emphasizes on a more strict inspection of the early stages of income calculation (i.e., revenue recognition, inventory valuation, depreciation expense).

3.2. Findings on the Operating Performance of IPO firms

This sub-section reports results on the operating performance of IPO firms for a period extending from four years prior to five years after the IPO year. As previously stated, the measure of operating performance is the ratio of NOPAT/NS.

Table 1: The 10-year Evolution of Operating Performance Around IPO year (Denoted as Year 0).

1. Smoothers (12 companies)

Year	-4	-3	-2	-1	0	1	2	3	4	5
Mean	16.512	19.989	19.779	20.186	22.072	22.437	18.711	19.355	17.984	18.034
Std. Error	1.651	2.434	2.433	1.818	1.894	2.332	2.576	5.584	2.514	20.821
Median	17.556	19.812	22.492	21.377	23.156	23.897	20.635	22.846	19.483	18.242
Std.Dev	5.745	8.477	8.431	6.298	6.562	8.077	8.924	8.951	8.709	9.773
Skewness	-0.863	-0.392	-0.483	-1.594	-1.686	-0.913	-0.986	-1.309	-1.028	-0.336
Kurtosis	0.586	-0.489	0.145	3.196	3.604	0.822	0.913	0.997	0.610	-0.217

2. Non-Smoothers (26 companies)

Year	-4	-3	-2	-1	0	1	2	3	4	5
Mean	16.852	18.162	18.078	17.994	18.942	18.414	17.863	17.904	16.305	15.075
Std. Error	1.208	1.299	1.132	1.308	1.350	1.329	1.192	1.006	1.334	1.115
Median	16.377	18.101	18.601	16.815	19.557	17.545	17.560	17.594	16.107	15.518
Std. Dev	7.446	8.011	6.975	6.668	6.883	6.777	6.077	5.132	6.800	5.684
Skewness	0.592	0.576	-0.087	0.139	0.201	0.614	0.355	0.265	-0.173	0.481
Kurtosis	0.652	0.823	-0.338	-0.940	-0.512	-0.011	-0.444	0.043	0.246	0.765

3. All (38 companies)

Year	-4	-3	-2	-1	0	1	2	3	4	5
Mean	16.852	18.162	18.078	18.686	19.930	19.648	18.131	18.362	16.835	16.009
Std. Error	1.208	1.299	1.132	1.063	1.112	1.192	1.133	1.052	1.197	1.172
Median	16.377	18.101	18.601	18.942	21.430	19.549	18.374	18.395	17.720	16.257
Std. Dev	7.446	8.011	6.975	6.550	6.854	7.349	6.985	6.487	7.377	7.223
Skewness	0.592	0.576	-0.087	-0.306	-0.286	0.125	-0.318	-0.632	-0.457	0.255
Kurtosis	0.652	0.823	-0.338	-0.629	-0.465	-0.590	0.260	0.729	0.018	0.312

4. T-test for differences in the mean values between the smoothers and non-smoothers sub-samples

Year	-4	-3	-2	-1	0	1	2	3	4	5
F-test [p-values]	1.037 [0.315]	0.326 [0.571]	1.566 [0.219]	0.747 [0.393]	0.879 [0.355]	0.227 [0.637]	1.174 [0.286]	4.492* [0.041]	0.410 [0.526]	3.908** [0.056]
T-test [p-values]	-0.215 [0.831]	0.925 [0.366]	0.913 [0.374]	0.978 [0.338]	1.346 [0.192]	1.499 [0.151]	0.299 [0.796]	0.636 [0.529]	0.590 [0.563]	1.180 [0.264]

Notes: Numbers are rounded to decimal points.

The F-statistic tests for the equality of variances between the two sub-samples. The T-statistic tests for the equality of means between the two sub-samples.

*indicates that the null hypothesis of equal variances or means is rejected at the 5% level of significance.

**indicates that the null hypothesis of equal means is rejected at the 10% level of significance.

The results of Table 1, concerning the total of the firms in the sample, reveal a slight increase in the operating performance around the IPO year, however, pre-IPO profitability margins are sustained for at least three years after the initial offering. The operating performance begins to deteriorate in year 4 and this trend is also apparent in year 5. Similar results are also observed for the non-smoothers sub-sample. Smoothing firms, however, display a somehow different pattern of operating performance. An increasing tendency in the NOPAT/NS ratio is observed in the pre-IPO period, which terminates one year after the IPO year. After that the operating performance drops to lower levels and is maintained to these levels with slight ups and downs. Although the values of both the mean and the median show that smoothers perform better than non-smoothers in all of the years of the study, the results of the t-tests show that there are no significant differences in the mean values of NOPAT/NS between the two sub-samples.

The results of Table 1 indicate that the 'window dressing' hypothesis, as expressed by Jain and Kini (1994), is not able to explain the evolution of the operating performance of IPO firms in Greece. The results reported here are in accordance with those of Papaioannou et al., (1997) and Travlos (1997) who argue that IPO firms in Greece sustain their pre-IPO profit margins for at least three years after the IPO year. The fact that in the IPO year operating performance is somewhat overstated as compared to the previous years, cannot be attributed to earnings management, since the same pattern is observed for both smoothing and non-smoothing firms. An explanation that better conforms to the results reported here could be that of Beaver *et al* (2000) who

argue that the decision to go public relates to factors such as peak in sales and earnings growth.

Jain and Kini (1994) also argue that the operating performance relates to the percentage of ownership control, which is maintained after the initial offering. In particular, they claim that firms, which maintain high ownership control, are more likely to conform to shareholder wealth maximization principles and therefore these firms are motivated to deliver high operating results.

TABLE 2: The 6-year Evolution of the ALPHA in the Port-IPO Period

1. Smoothers (12 companies)

Year	0	1	2	3	4	5
Mean	77.833	76.750	74.333	65.333	60.083	57.583
Std. Error	0.727	1.226	3.071	4.822	5.736	5.944
Median	77.500	77.500	77.500	72.000	68.500	58.500
Std.Dev	2.517	4.245	10.637	16.702	19.870	20.590
Skewness	0.143	-1.092	-2.711	-1.449	-0.839	-0.666
Kurtosis	-0.921	1.267	7.963	1.629	-0.726	-0.682

2. Non-Smoothers (26 companies)

Year	0	1	2	3	4	5
Mean	78.192	76.769	76.500	72.385	70.615	67.846
Std. Error	0.582	1.218	1.219	1.836	1.894	2.596
Median	78.000	78.000	78.000	75.500	75.000	71.500
Std.Dev	2.967	6.212	6.218	9.364	9.659	13.238
Skewness	0.275	-2.234	-2.103	-1.101	-0.750	-1.541
Kurtosis	0.068	6.210	5.734	0.496	-0.616	3.397

3. All (38 companies)

Year	0	1	2	3	4	5
Mean	78.079	76.763	75.816	70.158	67.299	64.605
Std.Error	0.455	0.909	1.265	2.008	2.323	2.655
Median	78.000	78.000	78.000	75.000	72.500	68.500
Std.Dev	2.803	5.606	7.798	12.378	14.319	16.365
Skewness	0.272	-2.123	-2.717	-1.709	-1.459	-1.267
Kurtosis	-0.086	6.132	8.844	3.369	1.900	1.198

4. T-test for differences in the mean values between the smoothers and non-smoothers sub-samples

Year	0	1	2	3	4	5
F-test	0.253	0.259	1.434	4.815*	12.714*	3.346**
[p-value]	[0.618]	[0.614]	[0.239]	[0.035]	[0.001]	[0.076]
T-test	-0.386	-0.011	-0.656	-1.671	-2.216	-1.582
[p-value]	[0.703]	[0.991]	[0.522]	[0.103]	[0.033]	[0.072]

Notes: Numbers are rounded to three decimal points

The F-statistic tests for the equality of variances between the two sub-samples. The T-statistic tests for the equality of means between the two sub-samples.

*indicates that the null hypothesis of equal variances or means is rejected at the 5% level of significance.

**indicates that the null hypothesis of equal variances or means is rejected at the 10% level of significance.

This argument is examined here by looking at the evolution of the ALPHA variable for smoothing and non-smoothing firms and for a period of six years (from year 0 to year 5). These results appear in Table 2 and evidence significant differences in the percentage of ownership control only in years 4 and 5. The yearly evolution of the ALPHA variable exhibits a declining pattern for all sample firms. The percentage of ownership control drops with a slow pace in years 1 and 2 and with a faster pace in years 3 to 5. Moreover, in years 4 and 5 the pace is faster for smoothing firms than for non-smoothing firms implying that in the long run, the size of the subsequent to the IPO equity offerings is related to the firms' window dressing behavior.

Taken together the results of Tables 1 and 2 suggest that there is no relation between operating performance and percentage of ownership control in the sense that firms, which maintain higher ownership control, do not deliver higher profitability margins. Moreover, the firms' smoothing behavior relates to the percentage of ownership control but bears no implications in terms of operating performance.

3.3. Findings on the Market Performance IPO Firms

This sub-section examines whether firm size, MVE/BVE and NEV are affected by the firms' decision to smooth income streams. The aim is to examine whether the performance of IPOs in the market reflects investors' expectations about future profitability and whether the market anticipates smoothing behavior.

Table 3: The 6-year Evolution of Market Capitalization (Size) in the Post-IPO Period (in thousands of Euros)

1.Smoothers (12 companies)

Year	0	1	2	3	4	5
Mean	41,644.90	35,376.61	28,626.80	49,366.34	43,663.98	40,851.06
Std. Error	22,038.41	18,760.84	14,572.69	18,440.92	15,370.05	12,526.74
Median	18,792.37	13,731.47	15,263.39	17,640.49	25,154.81	29,910.49
Std. Dev	76,343.30	64,989.46	50,481.26	63,880.41	53,243.43	43,393.90
Skewness	3.346	3.342	3.118	1.651	1.896	1.652
Kurtosis	11.406	11.375	10.117	1.466	2.556	1.776

2.Non-Smoothers (26 companies)

Year	0	1	2	3	4	5
Mean	40,199.87	44,653.41	44,902.77	53,224.12	61,513.95	59,397.04
Std. Error	12,681.16	18,458.38	17,846.58	18,938.36	30,093.91	30,570.71
Median	17,644.90	12,861.34	13,599.41	19,973.59	18,724.87	15,558.33
Std. Dev	64,661.48	94,119.65	91,000.09	96,973.59	153,449.51	155,880.64
Skewness	3.045	3.660	3.748	3.098	4.500	4.605
Kurtosis	9.533	14.472	15.436	9.992	21.385	22.226

3. All (38 companies)

Year	0	1	2	3	4	5
Mean	40,656.14	41,723.90	39,762.99	52,005.87	55,877.12	53,540.39
Std. Error	10,952.38	13,822.42	12,989.56	14,065.00	21,040.98	21,184.80
Median	17,644.90	13,731.47	14,928.83	18,994.86	20,937.64	17,914.89
Std. Dev	67,514.98	85,207.10	80,072.99	86,702.51	129,705.30	130,591.87
Skewness	3.030	3.648	3.951	3.012	5.055	5.297
Kurtosis	8.661	14.798	17.775	10.098	28.068	30.299

4.T-test for differences in the mean values between the smoothers and non-smoothers sub-samples

Year	0	1	2	3	4	5
F-test [p-values]	0.008 [0.928]	0.464 [0.500]	0.747 [0.393]	0.154 0.697].	0.733 [0.397]	1.035 [0.316]
T-test [p-values]	0.610 [0.952]	-0.308 [0.760]	-0.577 [0.567]	-0.126 [0.901]	-0.390 [0.699]	-0.402 [0.690]

Notes: Numbers are rounded to three decimal points.

The F-statistic tests for the equality of variances between the two subsamples. The T-statistic tests for the equality of means between the two subsamlpes.

*indicates that the null hypothesis of equal variances or means rejected at the 5% level of significance.

**indicates that the null hypothesis of equal variances or means is rejected at the 10% level of significance.

Table 3 displays the yearly evolution of market capitalization (size) of IPO firms over the five-year period following the IPO year. The results depict that in years 1 and 2 there are no significant changes in firm size as compared to the IPO year. The size of the sample firms increases significantly in year 3 and remains approximately at the same levels in years 4 and 5. Moreover, the t-tests suggest that there are no significant differences in the evolution of firm size between smoothers and non-smoothers. The results of Table 3 are consistent with those of Table 2 and suggest that the observed increase in firm size in year 3 may be attributed to new issues of equity stock. The subsequent issues of stock in years 4 and 5 are not as large as the respective of year 3 and thus bear no incremental effects on firm size.

Table 4 tabulates the yearly evolution of the MVE/BVE ratio. In the case of non-smoothing firms the results indicate that MVE/BVE is quite high in year 0 but decreases gradually throughout the rest of the period. In the case of smoothing firms, however, the results indicate a slightly different pattern of the of MVE/BVE ratio. The mean value of MVE/BVE is at high levels in year 0 and deteriorates in years 1 and 2. The ratio increases significantly in year 3 and then falls down to lower levels in years 4 and 5. Moreover, in year 3, the results of the t-test suggest that the observed difference in the mean value of MVE/BVE between smoothers and non-smoothers is marginally significant at the 10% level. On the other hand, the respective results of the F-test indicate significant differences in variance implying that the values of the MVE/BVE ratio of smoothing firms are more volatile than the respective of non-smoothing firms.

TABLE 4: The 6-year Evolution of Market Value of Equity to Book Value of Equity (MVE/BVE)

1.Smoothers (12 companies)

Year	0	1	2	3	4	5
Mean	3.521	2.528	1.782	2.789	1.791	1.373

Std. Error	0.524	0.400	0.320	0.754	0.298	0.188
Median	3.295	2.269	1.492	1.595	2.047	1.531
Std. Dev.	1.814	1.385	1.011	2.613	1.032	0.652
Skewness	0.820	1.537	0.347	1.054	-0.193	-0.804
Kurtosis	0.534	3.016	-0.816	-0.558	-0.850	0.171

2. Non-Smoothers (26 companies)

Year	0	1	2	3	4	5
Mean	2.803	2.153	1.842	1.811	1.659	1.418
Std. Error	0.289	0.267	0.240	0.199	0.204	0.177
Median	2.235	1.671	1.503	1.691	1.407	1.281
Std. Dev	1.472	1.407	1.222	1.013	1.039	0.904
Skewness	1.097	1.552	1.274	1.072	1.512	2.227
Kurtosis	1.321	2.734	0.968	2.071	3.032	5.487

3. All (38 companies)

Year	0	1	2	3	4	5
Mean	3.029	2.271	1.823	2.120	1.701	1.403
Std. Error	0.259	0.226	0.190	0.278	0.166	0.134
Median	2.690	1.804	1.503	1.640	1.471	1.430
Std. Dev	1.599	1.392	1.172	1.713	1.025	0.824
Skewness	0.999	1.437	1.035	1.860	0.981	1.854
Kurtosis	0.796	2.157	0.537	3.345	1.462	5.285

4. T-test for differences in the mean values between the smoothers and non-smoothers sub-samples.

Year	0	1	2	3	4	5
F-test	0.666	0.075	0.005	16.579*	0.274	0.050
[p-value]	[0.420]	[0.786]	[0.942]	[0.000]	[0.604]	[0.824]
T-test	1.201	0.771	-0.150	1.676**	0.367	-0.173
[p-value]	[0.245]	[0.449]	[0.882]	[0.102]	[0.717]	[0.864]

Notes: Numbers are rounded to three decimal points

The F-statistic tests for the equality of variances between the two sub-samples. The T-statistic tests for the equality of means between the two sub-samples.

*indicates that the null hypothesis of equal variances or means is rejected at the 5% level of significance.

**indicates that the null hypothesis of equal variances or means is rejected at the 10% level of significance.

In overall the results indicate that IPO firms deliver high stock returns during the IPO year. The market performance of non-smoothing firms exhibits a downward trend throughout the five-year period. On the other hand, the performance of smoothing firms shows a significant increase in year 3, which is accompanied by a decrease in the ALPHA variable, and by an increase in the size variable implying that new equity issues have taken place during this year. Under a general perspective the results are consistent with the IPO under-performance evidence. A slight deviation lies in the fact that in the early post-IPO period smoothing firms conduct subsequent equity issues which appear to yield high returns during the issuing year. In the period following the issuing year, however, the performance of smoothing firms displays a downward trend which may be taken to imply that subsequent to the IPO equity issues also under-perform in the long-run.

Table 5: the 6-year Evolution of the ratio of Normalized Excess Value [(MV-BV)/Sales]

1.Smoothers (12 companies)

Year	0	1	2	3	4	5
Mean	1.939	0.884	-0.192	1.879	0.117	0.109
Std. Error	0.540	0.217	0.639	1.506	1.008	0.447
Median	1.592	0.670	0.187	0.351	0.425	0.328
Std. Dev	1.869	0.750	2.213	5.218	3.491	1.548
Skewness	1.248	0.657	-3.058	1.153	-2.454	-2.188
Kurtosis	0.737	-0.883	10.114	2.322	7.657	6.282

2.Non-Smoothers (26 companies)

Year	0	1	2	3	4	5
Mean	1.006	0.603	0.484	0.482	0.360	0.193
Std. Error	0.171	0.153	0.139	0.104	0.111	0.093
Median	0.788	0.303	0.232	0.483	0.344	0.133
Std. Dev	0.871	0.779	0.710	0.528	0.566	0.474
Skewness	1.591	1.625	0.897	-0.041	0.564	1.870
Kurtosis	3.086	2.166	-0.307	-1.259	1.544	4.786

3. All (38 companies)

Year	0	1	2	3	4	5
Mean	1.301	0.692	0.271	0.923	0.283	0.167
Std. Error	0.214	0.125	0.224	0.479	0.318	0.151
Median	0.817	0.419	0.217	0.467	0.344	0.142
Std. Dev	1.321	0.772	1.378	2.952	1.963	0.931
Skewness	1.959	1.235	-3.971	2.616	-3.846	-2.619
Kurtosis	4.165	0.727	21.534	12.350	21.774	13.805

4. T-test differences in the mean values between smoothers and non-smoothers sub-samples

Year	0	1	2	3	4	5
F-test [p-values]	6.726* [0.014]	0.050 [0.825]	9.672* [0.004]	9.270* [0.004]	10.237 [0.003]	9.767* [0.004]
T-test [p-values]	2.117* [0.041]	1.061 [0.300]	-1.509 [0.140]	-0.908 [0.370]	-1.374 [0.178]	-1.362 [0.182]

Notes: Numbers are rounded to decimal points.

The F- statistic tests for the equality of variances between the two sub-samples. The t-statistic tests for the equality of means between the two sub-samples.

*indicates that the null hypothesis of equal variances or means is rejected at the 5% level of significance.

**indicates that the null hypothesis of equal variances or means is rejected at the 10% level of significance.

The yearly evolution of the NEV variable is tabulated in Table 5. The pattern of NEV shares many commonalities with the MVE/BVE pattern. In particular, non-smoothing firms deliver high values of NEV in year 0, which deteriorate throughout the rest of the period. Smoothing firms display high values of NEV in year 0, which decline in years 1 and 2, increase in year 3 and fall to lower levels in years 4 and 5. A rather interesting aspect is that the results of the t-test fail to reject the hypothesis of equal means during year 3. This implies that in terms of excess value, smoothing firms gain no systematic advantages over non-smoothers when conducting subsequent to the IPO equity issues. On the other hand, the results of the t-test indicate significant differences in year 0 implying that smoothers perform better than non-smoothers during the IPO year. However, the results of the F-test show that the pattern of NEV for smoothing firms is more volatile than that of non-

smoothers in almost every year (except year 1). Thus, it may be that smoothers deliver higher returns in year 0 because they are classified into higher risk classes and not because of any investors' overreaction to past earnings growth.

3.4. Regression Results

The results observed in the previous sub-section are also tested in a regression analysis framework. Eleven alternative regression models investigate on the factors that affect the market performance of IPO firms. In all models, the dependent variable is ΔNEV_t, which refers to the year-by-year change in NEV. Five explanatory variables are used interchangeably to construct the various models. These variables are: $\Delta PERF_t$, which refers to the annual change in operating performance and is expected to have a positive sign; ISM_t which is a dummy variable for income smoothing that takes the value of 1 when the firm is classified as an income smoother and 0 otherwise; $\Delta ALPHA_t$ which is the yearly change in ALPHA and reflects the percentage of ownership transmitted to the public through successive equity issues in the post-IPO period; $SIZE_t$ is a dummy variable for size that takes the value of 1 for small size firms (below median capitalization) and 0 otherwise; and MB_t is a dummy variable that takes the value of 1 for high market-to-book (low book-to-market) ratios and 0 otherwise. In all cases the dummy variables are multiplied by $\Delta PERF_t$ to investigate their incremental information content over operating performance.

TABLE 6: Regressions of Changes in the Market Performance and Various Explanatory Variables

Model	*Intercept*	*ΔPERF*	*ISM* ΔPEPF*	*ΔALPHA*	*SIZE* ΔPERF*	*MB* ΔPEPF*	*Adjusted R^2*	*Durbin-Watson Statistic*	*F- Statistic*	*N*
1	-0.048 (-0.091)	0.485* (3.473)					0.056	1.999	12.059* [0.001]	190
2	-0.127 (-0.251)	0.009 (0.049)	1.157* (4.351)				0.138	2.094	16.069* [0.000]	190
3	0.173 (0.318)	0.489* (3.511)		-0.067 (-1.514)			0.062	1.998	7.217* [0.001]	190
4	-0.053 (-0.101)	0.097 (0.423)			0.599* (2.118)		0.072	2.054	8.386* [0.000]	190
5	0.011 (0.021)	0.739* (4.242)				-0.665* (-2.388)	0.078	1.971	9.033* [0.000]	190
6	0.045 (0.086)	0.022 (0.133)	1.129* (4.236)	-0.052 (-1.212)			0.140	2.089	11.229* [0.000]	190
7	-0.130 (-0.261)	-0.351 (-1.445)	1.141* (4.327)		0.566* (2.089)		0.153	2.132	12.361* [0.000]	190
8	-0.064 (-0.129)	0.274 (1.413)	1.206* (4.611)			-0.748* (-2.820)	0.168	2.058	13.762 [0.000]	190
9	0.034 (0.065)	-0.331 (-1.364)	1.114* (4.216)	-0.049 (-1.163)	0.557* (2.058)		0.154	2.127	9.627* [0.000]	190
10	0.101 (0.198)	0.053 (0.180)	1.162* (4.429)	-0.053 (-1.264)	0.311 (1.074)	-0.641* (-2.238)	0.172	2.085	8.870* [0.000]	190

Model	*Intercept*	*ΔPERF*	*ISM* ΔPEPF*	*ΔALPHA*	*SIZE* ΔPERF*	*MB* ΔPEPF*	*Adjusted R^2*	*Durbin-Watson Statistic*	*F- Statistic*	*N*
11	-0.076 (-0.154)	0.024 (0.081)	1.189* (4.540)		0.326 (1.126)	-0.626* (-2.185)	0.169	2.087	10.653* [0.000]	190

Notes: Regression results for changes in the normalized excess value (*ΔNEV*) against five explanatory variables for the pooled sample of 190 observations (38 companies for a five-year period). The explanatory variables are: *ΔPEPF* which represents changes in the operating performance; *ISM* which is a dummy variable that takes the value of 1 when the company is classified as an income smoother, and the value of 0 when the company is classified as non-smoother; *ΔALPHA* represents changes in ownership structure; *SIZE* is a dummy variable that takes the value of 1 for small-size firms and 0 otherwise; and MB is a dummy variable that takes the value of 1 for high *MVE/BVE* companies and the value of 0 for low *MVE/BVE* companies. The dummy variables used in the respective models are multiplied by *ΔPERF* so as to investigate whether changes in the operating performance of smoothing firms, small firms and high *MVE/BVE* firms have incremental explanatory power for the changes in market performance.The t-values are reported in the parentheses below the coefficient estimates (t-value). The p-values are reported in brackets [p-value].

*indicates significance at the 5-percent level.

Table 5 reports the results of the eleven regression models. Models 1 to 5 evaluate the information content of $\Delta PERF_t$, ISM_t, $\Delta ALPHA_t$, $SIZE_t$ and MB_t for ΔNEV_t. Model 1 depicts that changes in operating performance explain changes in market performance. The low value of adjusted R-square however, indicates that the market utilizes other sources of information in forming security prices. Model 2 suggests that smoothing behavior bears incremental information content over changes in operating performance. It appears that the market places more emphasis on the operating performance of smoothing firms rather than on the operating performance of non-smoothing firms. This may be taken to imply that changes in the operating performance of non-smoothing firms are expected and therefore impounded in share prices. On the other hand, changes in the operating performance of smoothing firms appear to be unexpected since they exhibit significant information content for changes in the market performance. Thus, it appears that the market anticipates income-smoothing behavior and does not impound expectations about future earnings in current years' stock prices. Model 3 suggests that the information content of changes in the ownership structure is encompassed by the information content of ΔPERF. Models 4 and 5 depict that the size of the firms and the market to book ratio bear significant incremental information content over ΔPERF in explaining changes in market performance. Moreover, the sign of MB is found to be negative implying that changes in the market performance are positively correlated to book-to-market ratios (the inverse of MB).

In models 6 to 11 ΔPERF and ISM are examined in combination with the rest of the explanatory variables. In all cases ΔPERF is found to be insignificant while ISM is found to be significant. Models 6, 9 and 10 depict that ΔALPHA is insignificant and bears no information content over the rest of the explanatory variables. Models 8, 10 and 11 suggest that the MB ratio is a significant explanatory variable and that its information content is not encompassed by any of the rest variables.

A rather surprising result concerns the explanatory power of size. It appears that size has incremental explanatory power when considered together with ΔPERF and ISM (models 7 and 9). However, models 10 and 11 show that the explanatory power of size is overlapped by the information content of MB. The observable implication is that in explaining the performance of IPO firms in Greece the book-to-market ratio is a better explanatory variable than size.

In overall the results suggest that ISM and MB explain the performance of IPOs in Greece implying that the market classifies IPO firms into risk classes according to income smoothing behavior and book to market ratios. Thus, income smoothing and book-to-market ratios are the two factors that explain the long-run underperformance of IPOs in Greece.

4. Summary and Implications

This article examines whether window dressing practices affect IPO valuation in the Greek Stock Market. Income smoothing methodology is used to account for window dressing behavior among Greek IPO firms. This enables the classification of sample firms into two separate sub-samples of smoothers and non-smoothers. For each one of the two sub-samples the evolution of operating and market performance is examined over a period of ten years around the initial offering year.

The results are consistent with those of Papaioannou et al., (1997) and of Travlos (1997) and depict that IPO firms in Greece manage on average to sustain their profitability margins for at least three years after the initial offering year. Smoothers perform better than non-smoothers, however, non-smoothers exhibit a more stable earnings pattern in the post-IPO period. Furthermore, non-smoothers maintain higher percentages of ownership for a period of three years after the IPO year implying an inclination to shareholder wealth maximization principles. This enables them to signal their quality to the market in order to achieve better prices to subsequent equity issues. On the other hand, it is found that smoothers conduct subsequent to the IPO equity issues in earlier years than non-smoothers. However, despite the fact that smoothers deliver higher returns, on average they do not appear able to gain systematic advantages. The market is found to be able to anticipate smoothing behavior and in general, classifies smoothers into higher risk classes.

In the context of the regression analysis the results suggest that changes in operating performance capture much of the variability in the market performance of IPO firms in Greece. The information content of accounting profitability is improved when a dummy variable for intentional smoothing is included. This variable potentially accounts for omitted risk factors in the model and shows that the market anticipates future intentional smoothing behavior. Moreover, size and book-to-market ratios exhibit incremental information content in explaining the market performance of IPO firms in Greece, although the information content of size is encompassed by the respective content of the book-to-market ratio.

The results reported in the present paper bear some implications for the behavior of the Greek IPOs market. It appears that the over-reaction hypothesis cannot properly explain the evolution of the performance of Greek IPO firms. It is more likely that the observed high initial returns are due to systematic IPOs underpricing rather than to investors' over-reaction to past earnings growth. A potential explanation is that IPO firms in Greece use underpricing as a mechanism to signal their quality to the market. Smoothing firms, which exhibit superior operating performance underprice their stock to

a greater extend than non-smoothing firms. Thus, if operating performance represents firm quality, then the existence of a positive relation between underpricing and changes in operating performance is consistent with the signaling explanation for underpricing (Allen and Faulhaber, 1989; Grinblatt and Hawng, 1989). Additional evidence supporting the underpricing explanation, namely, that high-quality firms underprice their stock at the IPO and subsequently conduct SEOs when the market prices are established and there has been an opportunity for information revelation, is provided by Tsangarakis (1993), Papaioannou et al., (1997) and Travlos (1997). In particular, Tsangarakis (1993) evidences that SEOs in Greece do not yield abnormal returns on the ex-rights day. On the other hand, Papaioannou et al., (1997) and Travlos (1997) fail to support the predicted market correction to abnormal returns in the post-IPO period by evidencing that IPO firms in the long run perform relatively well as compared to the market and to their industry counterparts.

In addition, inferences on over-reaction cannot be drawn solely on the basis of realized returns but require due consideration of the prevailing risk-return relation. The findings of the present paper indicate that smoothers deliver higher returns because they fall into higher risk classes. On the other hand no evidence of over-reaction is apparent to non-smoothing firms which fall into lower risk classes. Thus, the reported results not only do they fail to support over-reaction but they depict that the predicted risk-return relation holds up relatively well in all cases.

The results of this paper also bear implications for both investors and financial analysts. First, it appears that new issues in the Greek Stock Market provide opportunities for portfolio investments, which deliver returns that adequately compensate for the underlying degree of risk. Moreover, the degree of underpricing may signal opportunities for alternative strategies of portfolio formation. The higher is the extent of underpricing the higher is the possibility that the issuing firm exhibits smoothing behavior. In the early post-IPO period smoothers provide superior performance and transmit high percentages of ownership to the public. It may thus, appear that smoothers' shares are appropriate for investors who pursue trading strategies. On the other hand, non-smoothing firms underprice their stock to lesser extents and their shares are deemed appropriate for investors who follow buy and hold strategies because they are likely to display an inclination to shareholder wealth maximization principles.

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