The Value Relevance of Earnings and Income Smoothing: Greek Evidence on Causality Effects

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Abstract

The present paper examines the existence of causality between income smoothing and value relevance of earnings for a sample of firms listed in the Athens Stock Exchange. Using a switching regression model we find evidence suggesting that the low information content of earnings may be a motive for managers to engage in actions that signal the existence of income smoothing. A potential explanation for our results is that management uses income smoothing in order to maximize its utility rather than to affect investors expectations about the future prospects of the firm in the market.

1. Introduction

Over the last three decades the relation between accounting earnings and stock returns has been in the center of capital-market-based accounting research. Many researchers have used different contextual settings from several institutional environments and have reported various degrees of association between alternative earnings variables and stock returns. The results of many of these studies along with some methodological issues and implications for future research are summarized in Brown (1994), Kothari and Zimmerman (1995) and Easton (1999).

In general, the main conclusion that emerges from most of these studies is that earnings possess a significant information content for stock returns when the data

are averaged over a long time interval (i.e., over a period of ten years). When, however, the period examined is short or when cross-sectional methodology is employed then the information content of earnings for stock returns appears to be very low. Thus, many researchers have, explicitly or implicitly, questioned the quality of earnings as an explanatory variable for stock returns. For example, Lev (1989) has argued that accounting earnings are biased explanatory variables for stock returns because they are subject to manipulations that managers deliberately make to reported financial data.

This potential explanation has guided a number of researchers to test whether managers window-dress their companies' financial statements to influence investors' expectations and affect the performance of their companies in the market. For example, Teoh, Welch and Wong (1998a,b), Aharony, Lee and Wong (2000) and Beaver, McNichols and Nelson (2000) among others have provided evidence on the existence of earnings management (intentional or not) around initial and seasoned equity offerings (IPOs and SEOs). Moreover, the studies of Teoh *et al* and of Aharony *et al* have revealed that firms, which manage their earnings, deliver on average lower returns than the rest of the IPO or SEO firms for a period of at least two years. This finding is consistent with the hypothesis that firms engage in earnings management practices in order to reduce financial risk (earnings variability). Michelson, Jordan-Wagner and Wooton (1995) have generalized the evidence by examining a wider sample of US firms that is not limited to IPO or SEO firms. They have found that income smoothing (a form of earnings management) is common among listed firms in the USA and relates to differences in market performance and risk. Consistent with the previous line of evidence, the study of Michelson *et al* has reported lower returns and lower betas for firms with smooth earnings patterns.

Most of the studies that examine the implications of earnings management on market performance fail to incorporate the issue of whether the value relevance of earnings is affected by earnings management. This research question has initially been addressed by Booth, Kallunki and Martikainen (1996) who have examined whether income smoothing relates to the earnings post-announcement drift in stock prices. Using a sample of Finnish firms, Booth *et al* have shown that earnings are important in determining the prices of firms that do not smooth income streams. In addition, they have found that the announcement of smoothers' earnings does not lead to significant market reaction, as does the announcement of earnings of firms that do not smooth income.

The evidence examined thus far suggests that earnings management relates, at least up to an extent, to market under-performance and to weak explanatory power of earnings for stock returns. Moreover, all the studies, except that of Beaver *et al*, assume that the management of earnings is the result of intentional (opportunistic) managerial behavior. Beaver *et al* on the other hand, although they support the finding of the existence of some level of earnings management around IPO and SEO years, they fail to fully sustain the hypothesis that earnings management is due to intentional managerial discretion over accruals. Beaver *et al* offer a potential explanation that it may be the decision to issue new equity shares being correlated

with factors such as peak in sales and earnings growth that causes firms' accruals to appear extreme and hence signal the existence of earnings management.

The present paper expands on the explanation provided by Beaver *et al* in an earnings-returns relation framework. In particular, the paper poses the empirical question of Beaver *et al* the inverse way. That is, instead of testing whether earnings management bears implications on the earnings-returns relation, the paper tests whether the low explanatory power of earnings for stock returns causes earnings management. That is managers wishing to improve the information content of earnings involve in actions, which signal the existence of earnings management. This explanation is consistent with recent evidence suggesting that managers who are concerned about job security have incentives to smooth earnings in order to improve both current and future relative performance (i.e., DeFond and Park, 1997). Thus, if current stock prices capture information about current and future earnings, then weak market performance and low earnings explanatory power may be seen as a strong incentive for managers to smooth earnings in consideration of both current and future relative profitability.

The remainder of the paper is organized as follows. The second section presents the data and explains some methodological issues. The third section discusses the empirical findings and the fourth and final section summarizes conclusions and implications for further research.

2.   Research Methodology

2.1.   The data set

The present article uses financial statement information and stock price data for a sample of 42 companies listed on the main and the parallel market of the Athens Stock Exchange (ASE) during the period from 1/1/1991 to 31/12/1999. Data for the sample firms have been extracted from the yearly editions of the ASE and from the statistical bulletins of the ASE.

The sample does not contain financial sector firms for two basic reasons. First, these firms do not follow the guidance of the Greek General Accounting Plan for income calculation as non-financial companies do. Second, the low proportion of equity in their capital structure, which is normal for these firms, does not have the same meaning as for non-financial firms where high leverage is likely to indicate distress.

For each year and for each firm in the sample, a number of firm-year variables have been collected. These include net sales (NS), net operating profit after taxes (NOPAT), net period earnings (E), yearly average share price (P) and dividends paid to share holders (D).

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 (i.e., Barnea *et al*, 1976; Belkaoui and Picur, 1984; Lambert, 1984; and Albrecht and Richardson,

1990). Many empirical studies assume that income smoothing is motivated by a desire of firms to enhance the predictability of future earnings. This explanation is justified by two different but not unrelated views. The first view states that management considers fluctuations in income and unpredictable earnings to be the causal determinants of systematic risk (Lev and Kunitzky, 1974; Beattie *et al*, 1994; Michelson *et al*, 1995; and Booth *et al*, 1996). The second view asserts that management uses income smoothing as a means to maximize its utility and 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). This latter view encompasses also certain theoretical approaches, which argue that concern about job security creates incentives for managers to smooth earnings in consideration to both current and future relative performance (DeFond and Park, 1997).

One way to study the existence of income smoothing is by comparing the variability of various definitions of income with the variability of sales. This method has been initiated by Eckel (1981) and has also been applied by a number of subsequent studies (Albrecht and Richardson, Michelson *et al*, Booth *et al*, and Carlson and Bathala). Following 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: ΔI_t = change in income over period t,
         ΔS_t = change in net sales over period t, and
         CV = coefficient of variation (standard deviation/expected value) calculated over the entire 9 year period.

Michelson *et al*, in order to identify different smoothing instruments, use various definitions of income and result in three alternative models of detecting income smoothing. A variant of this approach is also employed here by choosing two definitions of income: net operating profit after taxes (NOPAT) and net period earnings (E). Equiped with two definitions of income the smoothing ratio can be calculated in two specific ways. Therefore, sample firms may be categorized as income smoothers and non-smoothers under either of the two models:

Model I: A firm is classified as an income smoother if at least one of the two smoothing ratios lies between zero and one, and

Model II: A firm is classified as an income smoother if both smoothing ratios lie between zero and one.

It is quite evident that by moving from model I to model II the conditions for classifying a firm as an income smoother become stricter. The intuitive appeal of this approach 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 the other, or in other words by setting more restrictive requirements.

3.3. The Model

The model employed, draws from the regression switching regime literature. In particular, the variable of yearly stock returns $y = (P_t - P_{t-1} + D_t)/P_{t-1}$ is described, as in Easton and Harris (1991), by a vector $x = [E_t/P_{t-1}, \Delta E_t/P_{t-1}]$ of a priori assumed weakly exogenous variables in two different regimes dependent upon whether or not a firm decides to smooth its earnings pattern. Leting the subscript S denote the first regime under which the variable y operates and NS the coplementary regime, then the function that explains the relaton between stock returns and earnings is given by the equation:

$$y_i = x'_{i,S}\beta_S + \varepsilon_{i,S} \qquad \text{if firm } i \text{ decides to smooth its income, and} \qquad (1)$$

$$y_i = x'_{i,NS}\beta_{NS} + \varepsilon_{i,NS} \quad \text{otherwise} \qquad (2)$$

where, x and β are vectors of variables and parameters corresponding to the structural description of y under the two regimes. Thus, the sample separation in this model is known meaning that a firm's decision to smooth its income is available information. The important point here is that the distribution of the income smoothing status is not independent of the information content of earnings for stock returns.

A way to get consistent estimates is to utilize a two-stage estimation procedure. The structure of the two stage technique is characterized as follows:

$$y_i = x'_{i,S}\beta_S + \varepsilon_{i,S} \qquad \text{if } \gamma'z_i \geq e_i \text{ and} \qquad (3)$$

$$y_i = x'_{i,NS}\beta_{NS} + \varepsilon_{i,NS} \quad \text{otherwise} \qquad (4)$$

where $\gamma'z_i$ is a stochastic criterion function of variables z_i and parameters γ determining whether a firm i decides to smooth its income or not. Therefore an indicator function I_i is constructed such that:

$$I_i = 1 \qquad \text{if } \gamma'z_i \geq e_i \text{ and firm } i \text{ decides to smooth its income,}$$

$$I_i = 0 \qquad \text{otherwise,}$$

where γ can be estimated up to a scale factor by probit methods. It is assumed that $\varepsilon_{i,S}$ $\varepsilon_{i,NS}$ and e_i to be trivariate normally distributed with zero mean and covariance matrix of the following form:

$$\begin{bmatrix} \sigma_S^2 & \sigma_{S,NS} & \sigma_{S,e} \\ \sigma_{NS,S} & \sigma_{NS}^2 & \sigma_{NS,e} \\ \sigma_{e,S} & \sigma_{e,NS} & 1 \end{bmatrix}$$

It follows that:

$$E(\varepsilon_{i,S}|e_i \leq \gamma'z_i) = -\sigma_{S,e} \frac{\varphi(\gamma'z_i)}{\Phi(\gamma'z_i)} = -\sigma_{S,e}\omega_{i,S}$$

and in a similar way

$$E(\varepsilon_{i,NS}|e_i \leq \gamma'z_i) = -\sigma_{NS,e}\frac{\varphi(\gamma'z_i)}{\Phi(\gamma'z_i)} = -\sigma_{NS,e}\omega_{i,NS}$$

where $\varphi(.)$ and $\Phi(.)$ are respectively the standard normal density function and its cumulant evaluated at its argument (see Maddala, 1983, p. 224). Therefore, equations (3) and (4) may be written as:

$$y_i = x'_{i,S}\beta_S - \sigma_{S,e}\omega_{i,S} + u_{i,S} \qquad \text{for } I_i = 1 \text{ and} \qquad (5)$$

$$y_i = x'_{i,S}\beta_{NS} - \sigma_{NS}\omega_{i,NS} + u_{i,NS} \quad \text{otherwise} \qquad (6)$$

where the residuals u are implicitly related to the residuals ε in equations (3) and (4). Thus, the two-stage method utilizes probit analysis in the first stage and a least squares procedure in the second stage. Specifically, in the first stage probit estimates of γ permit establishing values for ω_S and ω_{NS} for each i from the evaluation of functions $\varphi(.)$ and $\Phi(.)$. In the second stage equations (5) and (6) are estimated by weighted least squares.

It should be pointed out here that since the variable y does not appear in the vector z and if $\sigma_{S,e}$ and $\sigma_{NS,e}$ are both equal to zero then the switching process may be thought of as exogenous. Expressed in another fashion the variable y does not cause z and thus z may be considered as independent of y. Consequently, if the estimated coefficients $\sigma_{S,e}$ and $\sigma_{NS,e}$ in equations (5) and (6) are statistically insignificant then there is no correlation between ε and e which implies that y does not cause z.

3.   Analysis of the Results

The analysis of the empirical results presented in this section presumes that significance is measured at the five-percent level unless otherwise stated.

3.1.   Findings on income smoothing

The two alternative smoothing ratios described in the previous section have been calculated for all sample firms and over the entire nine-year period. The results indicate that income smoothing is quite popular among greek firms. Eighteen out of the forty two sample companies have been found to smooth either operating or net earnings. However, only three firms were found to classify as income smoothers by both smoothing ratios. Moreover, the results have depicted a preference of firms to use net period earnings as their smoothing instrument. A potential explanation may be because the calculation of net earnings includes extraordinary items which are not accounted for operating earnings calculation and which can easily be manipulated. Thus, a preliminary conclusion of the paper is that earnings management in Greece, is practiced to a great extend, through extraordinary items where accruals are likely to be subject to managerial descretion.

The probit estimation of the income smoothing decision function has yielded the following estimates (t-values are in parentheses):

$$D = 13.2 + 1.15\,S + 0.85\,E + 0.56\,FS \qquad (7)$$
$$(3.65)\quad(2.63)\quad(3.08)\quad(6.32)$$

where, S represents net sales, E, net period earnings and FS, firm size measured by total capitalization. These variables are measured in billions of drachmas and are in log-form. The values of the t-statistic show that all estimated coefficients are statistically significant at the five-percent level. Moreover, the signs of the co-efficients are positive for all three variables. These results suggest that firms with high level of sales and net earnings and large size are more likely to use income smoothing techniques. This finding has a major implication. The studies examining the impact of income smoothing on market performance report low returns for smoothing firms. However, the results reported here suggest that smoothing firms are on average large firms. And of course, large-size firms have long been evidenced to deliver on average lower returns than small-size firms. Therefore, the evidence reported here enhances the argument that it may be that certain factors such as large size and peak in sales cause accruals to be extreme and signal the existence of income smoothing.

3.2.   Findings on the value relevance of earnings

The two-stages estimates of the equations (5) and (6) have been obtained by spliting the sample into two groups, smoothing firms and non-smoothing firms. The standard errors have been estimated taking into account the existence of heteroscedasticity. The empirical estimates are presented below:

Regime I: $\qquad\qquad y = 0.84 + 0.52x - 1.27\omega_S \qquad\qquad (8)$
$$(3.30)\quad(2.18)\quad(1.97)$$

Regime II: $\qquad\qquad y = 1.95 + 1.69x + 0.98\,\omega_{NS} \qquad\qquad (9)$
$$(2.47)\quad(2.42)\quad(3.36)$$

The coefficients of the earnings variables x are positive and significant for both equations (8) and (9). This suggests that earnings contain significant information for stock returns in Greece. However, non-smoothing firms appear to have better information content than smoothing firms. This implies that the market recognizes income smoothing practices and values the earnings of non-smoothing firms more than the earnings of smoothing firms.

On the other hand, the coefficients of ω_S and ω_{NS} are found to be significant at the 5% level. This implies that there is evidence about causality effects from the returns-earnings relation to income smoothing. Taken together the results suggest that the decision to smooth income may be motivated by the low information content of earnings.

The results reported here do not lend support to the view that managers involve in income smoothing in order to affect investors expectations. Given the great volume of literature on the subject, managers must be well aware of the fact that the market recognizes smoothing practices and adds nothing to the value of smoothing firms. A more likely explanation could be that managers who are concerned about

their job security look at the returns-earnings relation as a means to make infer-
ences about current and future relative performance. The low explanatory power of
current earnings for stock returns translates to earnings which are not informative
for share holders and which cannot be used as valuation attributes. In these cases
management have incentives to smooth earnings so as to reduce their fluctuations,
to enhance their predictability and thus improve the information content of current
earnings for stock returns and future earnings.

Summary and Conclusions

The present paper examines the existence of causality between income smooth-
ing and value relevance of earnings for a sample of greek firms. The results of the
paper suggest that income smoothing is quite popular among greek firms and is
performed through the manipulation of extraordinary items. Moreover, income
smoothing is found to relate to factors such as high levels of sales and earnings
and large firm size.

The results also indicate that earnings are significant explanatory variables
for stock returns. However, this significance is lower for smoothing firms than for
non-smoothing firms implying that the market recognizes smoothing practices. On
the other hand, the evidence on causality between income smoothing and earnings-
returns relation leads to the conclusion that income smoothing may be motivated
by the low information content of earnings.

On the assumption that current stock prices convey information about future
earnings, a potential explanation for these results could be that managers who
are concerned about their job security have incentives to involve in actions that
signal the existence of income smoothing in consideration of their future relative
performance. This explanation supports the view that management uses income
smoothing in order to maximize its utility rather than to affect investors expecta-
tions about the future prospects of the firm in the market. However, the extend to
which income smoothing enhances managerial job security is an issue that requires
further analysis and expands beyond the scope of the present paper.

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