FACTORS THAT EXPLAIN THE INCIDENCE OF INCOME SMOOTHING: EMPIRICAL EVIDENCE IN THE PORTUGUESE STOCK MARKET

ABSTRACT

A goal of manipulation widely ascribed to managers is the desire to smooth reported income, which consists of practices deliberately employed by them in order to reduce the variability of the income streams. The purpose of the present investigation is twofold. First, we seek to determine if the existence of alternative options in terms of accounting policies induces income smoothing behaviour. Second, we pretend to identify the explanatory factors of the incidence of income smoothing. Our research sample comprises companies listed on the Main Market of the present Euronext Lisbon, over a period of five years. The results of this study confirm that our sample companies are actively engaged in accounting income smoothing practices. Furthermore, among the many variables considered, the systematic risk, the market value, the size of the company, the proportion of interest borne, the ownership structure, and the activity sector proved to be the factors which have largely contributed to explain such behaviour.

Keywords: earnings management, accounting income smoothing, discretionary accounting.

1. INTRODUCTION

It is common knowledge that income is a key variable in accounting since it is on the basis of this measure that financial information users assess the efficiency of management, become aware of the company's evolution, compare the company's present situation against its past, develop forecasts, among others.

Notwithstanding and despite the efforts that have been developed by several accounting standard setters, the preparation of financial data is guided by rules that necessarily comprise elements of subjectivity. Furthermore, oftentimes the enforcement of such rules requires companies' forecasts. As a result, different numbers may describe the same reality. Moreover, the flexibility feature of the accounting standards allows the choice of different criteria to reveal the same economic event. Therefore, those financial information users who make decisions based on the accounting income are truly relying on a measure that is easily subject to manipulation both in terms of its preparation and its communication to the outside.

Over the past few decades this problematic concerning the manipulation of the accounting income has been regarded as a major research topic. Alongside, the recurrent financial scandals that took place over the last years (e.g. Enron and Parmalat, just to mention a few), far from seldom involving well-reputed auditing firms, have brought this problematic forward from the research arena into the actuality domain.

The income smoothing is a dimension of the accounts manipulation theme that has been attracting a great deal of attention in the accounting literature devoted to the earnings management. This reflects an ancient concern that remains up to date with the ultimate goal of reducing the possible income fluctuations so as to make it as stable as possible throughout time. Eckel (1981) suggested that there might be different sorts of income smoothing, including the natural and the intentional smoothing. The natural smoothing stems from the process of income generation itself, which inherently produces a smooth income stream. On the other hand, the intentional smoothing stems from the manager's willingness to undertake a set of actions aimed at obtaining a smoothed income. To this end, the manager may manipulate either accounting variables (artificial or accounting smoothing) or real variables (real smoothing, economic smoothing, or yet transactional smoothing)[1].

[1] Both the real and the artificial smoothing are targeted at the maintenance of a regular and sustained income growth. However, while the real smoothing is achieved through the control of economic events, the artificial smoothing takes place through the selection of accounting procedures in the extent allowed by the generally accepted accounting

Although this topic is widely covered in the relevant literature, to the best of our knowledge there is only one such study referring to the Portuguese setting (Ferreira *et al.*, 2003), which is confined to the income smoothing incidence in the banking sector. We fill an important gap by expanding the research into the manipulation of the accounting income into three sideways: (1) focus on the Portuguese setting; (2) coverage of several sectors other than the banking sector; and, (3) analysis of the factors prompting the adoption of accounting income smoothing behaviour.

The procedures carried out to reduce the cyclical nature of the accounting income being a major up-to-date concern coupled with the lack of development of such topic in the Portuguese context, led us to investigate the income smoothing behaviour based on a sample of companies listed on the Main Market of the present Euronext Lisbon. The purpose of the present investigation is twofold. Firstly, we inspect the extent to which the listed companies smooth their reported income so as to ultimately split the sample into two groups: (1) the group of companies engaged in accounting or artificial income smoothing, and (2) the group of companies that do not discretionarily select accounting procedures in order to achieve a normalized income stream. Secondly, we pretend to identify the motivations and the company's features that may explain the adoption of an income smoothing behaviour. Drawing on the extant literature, we would expect the income smoothing behaviour to be associated with the company's risk, the market value, the political visibility, the leverage level, the ownership structure, the profitability, and the economic sector.

The remainder of the paper is organised as follows. Section 2 is a brief literature review on income smoothing to the extent that it relates to the issues addressed by this study. Section 3 is concerned with the research method. In section 4 we present and discuss our research findings. Finally, section 5 summarizes our findings and their implications, it highlights the main limitations of this study and suggests possible avenues for future research.

2. INCOME SMOOTHING: PREVIOUS AND RELATED RESEARCH

A measure commonly used in the literature to identify those companies that engage in income smoothing practices, which was pioneered by Eckel (1981), is to define an index

principles and accounting standards. Barnea *et al.* (1976) further classifies the accounting income smoothing into inter-temporal smoothing (it draws from the time at which the costs and revenues are recognised) and classificatory smoothing (as it is the case of the events' classification as ordinary or extraordinary so as to inflict a smoothed look to the ordinary income).

of smoothing based on the computation of coefficients of variation. Eckel's methodology has been replicated and expanded by many researchers, including Albrecht and Richardson (1990), Ashari *et al.* (1994), Booth *et al*. (1996), Carlson and Bathala (1997), Michelson *et al*. (1995, 2000), and, more recently, Iñiguez and Poveda (2004).

The outstanding popularity of such method to split a sample into two groups (income smoothing *versus* absence of income smoothing) can be pinned down to a number of factors. Firstly, the index quantifies the extent of income smoothing by aggregating the effects of a set of potentially relevant smoothing variables, instead of focusing on a sole accounting variable (Ashari *et al*., 1994). Therefore, this measure is likely to describe a company's income smoothing behaviour more faithfully (Iñiguez and Poveda, 2004) since accounting procedures are not chosen independently; rather, companies select them in light of their joint expected effects on income (Zmijewski and Hagerman, 1981). Secondly, time series data are used to compute the income smoothing index whereas many studies rely on data from a single period in time (Albrecht and Richardson, 1990; Ashari *et al*., 1994). In fact, as stated by Moses (1987), while multiple-period studies capture smoothing accomplishment, single-period studies only reflect smoothing attempts. Thirdly, the use of coefficients of variation is useful in that they are a dimensionless measure of a sample's variability, thereby providing for the comparison of variances among different groups (Albrecht and Richardson, 1990). Fourthly, being a relative measure the coefficient of variation is a very helpful method to compare sets of data with different means and standard deviations; consequently, the index is a good instrument to define groups in terms of the degree of companies' income smoothing (Iñiguez and Poveda, 2004).

Lastly, unlike other smoothing measures (see, for example, Dascher and Malcom, 1970; White, 1970, 1972; Ronen and Sadan, 1975; Moses, 1987), the proposed index quantifies the incidence of income smoothing without the need to define the so called 'expectancy model'- a model aimed at estimating the supposedly normal or expected income against which one seeks to reduce income fluctuations. As a result, the index is not sensitive to the use of any income prediction model; instead, it is confined to the measurement of the variability of the reported income (Albrecht and Richardson, 1990; Ashari *et al.*, 1994). This becomes a major strength if one takes into account that the specification of an expectancy model is a difficult task and that an inadequate specification of the normal income generation process may lead to inferences that are a function of random errors (Imhoff, 1977; Eckel, 1981).

Nevertheless, extant research has gone beyond the identification of income smoothing behaviours to include the characterization (motivations and features) of the companies that engage in these sort of practices. Several such studies (e.g. Lev and Kunitzky, 1974; Amihud *et al*., 1983; Chalayer, 1994; Wang and Williams, 1994; Michelson *et al*., 1995; Iñiguez and Poveda, 2004) have provided empirical support for the assertion that managers are committed to the reduction of income and cash-flows' variability as an attempt to reduce their companies' perceived risk. Additionally, it is widely acknowledged that income smoothing increases the value of the company (e.g. Gordon, 1964; Trueman and Titman, 1988; Gibbins *et al*., 1990; Chalayer, 1994; Chaney and Lewis, 1995, 1998)[2].

On the other hand, certain features of the company or its environment are normally invoked as possible smoothing determinants. Outstandingly, there are the hypotheses put forth by the positive accounting theory to justify a company's accounting choices and, subsequently, to understand the income smoothing practices. This theory, qualified as positive by Watts and Zimmerman (1978), traces a company's accounting policy back to the opportunistic behaviour of the managers by assuming that accounting choices are aimed at their wealth maximisation. Specifically, the positive accounting theory brings both the contractual relationships within the company and the political costs into the analysis in order to explain managers' accounting choices.

In effect, despite the existence of a number of contracts aimed at diminishing the agency costs, managers retain considerable manoeuvring power so they can pursue their personal goals. Oftentimes the contracts or the objectives they setup refer to the accounting figures, which managers can to a certain extent manipulate. Not surprisingly so, from an agency point of view, accounting research has concentrated a great deal on the analysis of the contracts negotiated within the company, and particularly on their consequences over the behaviour of the different parts concerned. In this context, the remuneration contracts that link managers to shareholders (Lambert, 1984; Healy, 1985; Moses, 1987; Gaver *et al*., 1995; Carlson and Bathala, 1997; Godfrey and Jones, 1999) and the contracts stemming from the relationships struck up with creditors (Trueman and Titman, 1988; Chalayer, 1994; Carlson and Bathala, 1997; Godfrey and Jones, 1999) may amount to an explanatory element of the income smoothing practices. Likewise, the political costs associated with the relationships between the company and the public powers (e.g. governments, media,

[2] The literature usually claims further motivations to engage in income smoothing practices, which, however, are beyond

investment analysts, labour unions) may prompt managers to pursue an income smoothing strategy (Moses, 1987; Craig and Walsh, 1989; Ashari *et al*., 1994; Beattie *et al*., 1994; Chalayer, 1994; Michelson *et al*., 1995, 2000; Saudagaran and Sepe, 1996; Carlson and Bathala, 1997; Iñiguez and Poveda, 2004).

In addition to the aforementioned company's environment related determinants, the company's capital structure and its control are widely acknowledged in the literature to be important determinants of accounting choices. Several researchers have tested this hypothesis in the context of income smoothing (e.g. Smith, 1976; Kamin and Ronen, 1978; Koch, 1981; Amihud *et al*., 1983; Beattie *et al.*, 1994; Chalayer, 1994; Carlson and Bathala, 1997; Godfrey and Jones, 1999). Furthermore, some empirical studies have also underlined the importance of companies' profitability (Archibald, 1967; White, 1970; Ashari *et al.*, 1994; Carlson and Bathala, 1997) and the sector in which they operate (Ronen and Sadan, 1981; Belkaoui and Picur, 1984; Albrecht and Richardson, 1990; Ashari *et al*., 1994; Kinnunen *et al*., 1995; Breton and Chenail, 1997; Michelson *et al*., 2000; Iñiguez and Poveda, 2004) as possible explanatory factors of accounting policy decisions.

As a preliminary step to establish the characteristics that differentiate companies that engage in income smoothing from those that are non-smoothers in Portugal, we derive our hypotheses from the relevant literature, as summarised in the next section. To the best of our knowledge, this is a pioneering research into the income smoothing practices in Portugal from this perspective.

3. RESEARCH METHOD

As previously stated, the purpose of this study is twofold. Firstly, we seek to determine if companies select accounting policies in order to smooth the reported income. Secondly, we uncover motivations and company features that may explain an income smoothing behaviour. The research method employed is summarized below.

3.1. HYPOTHESES FORMULATION

In this section, we enumerate the hypotheses underlying this study, which emerge from a survey of the extant literature, as briefly summarised in section 2. Hypotheses 1 to 3 test investors' rationality when faced with artificially smoothed income; particularly, they test whether investors are aware of companies' accounting manipulations and their artificial

the scope of our research due to lack of data that would allow empirical testing.

consequences over income variability. Next, there is a block of four hypotheses emerging from the positive accounting theory, which links income smoothing to the company's political visibility and its leverage level. Lastly, we include in the analysis the ownership structure, profitability, and activity sector as potential determinants of the income smoothing behaviour.

3.3.1. Income Smoothing and the Company's Risk

Empirical evidence has provided support for the hypothesis that the level of business risk decreases as the extent of smoothing increases (e.g. Lev and Kunitzky, 1974; Chalayer, 1994; Michelson *et al*., 1995; Iñiguez and Poveda, 2004). Most researchers agree that income smoothing, by decreasing the fluctuations of companies' income as general economic conditions evolve, reduces the uncertainty associated with future cash-flows. For example, the smoothing of production and investment expenditures decreases the sensitivity of a company's costs to economic fluctuations. As a result, a company that engages in income smoothing practices is less sensitive to the general economic fluctuations since the smoothing reduces the covariance between its income and that of the other companies in the market (Lev and Kunitzky, 1974; Chalayer, 1994)[3].

In this context, following Iñiguez and Poveda (2004), one of the effects we expect income smoothing to have on the market is to lower investors' perception of risk, which implies a decreasing systematic risk as the degree of smoothing increases.

Therefore, the null (H_0) and the alternative hypotheses (H_a) underlying our statistical test are the following:

H_{01}: There is no relationship between the artificial income smoothing and the systematic risk.

H_{a1}: The companies that engage in artificial income smoothing benefit from less systematic risk as compared to those that do not pursue such a behaviour.

Authors such as Lev and Kunitzky (1974) and Chalayer (1994) find it reasonable to assume that income smoothing is also a function of the unsystematic level of risk. This is the company's risk component that is invariant with the general economic conditions as it stems from specific factors that are company or sector related, and therefore whose effect is

[3] According to Lev and Kunitzky (1974) this covariance is closely related to the systematic risk of the stock (market beta), which reflects the covariance between the stock's rate of return and that of the market (as we can see from the Appendix 2).

confined to a given company and it may only extend to its closest competitors. For example, Lev and Kunitzky (1974) and Chalayer (1994) admit of smoothing activities possibly reducing a company's sensitivity to the sector economic fluctuations (e.g. demand variability). They also admit of smoothing activities reducing a number of conflicts including labour problems since employees or unions demands are sensitive to fluctuations in earnings. Significant decreases may signal periods of crisis and significant increases may lead employees to demand higher wages, which in turn could cause production halts or slowdowns, and, consequent productivity fluctuations.

Given the above, we find it relevant to establish whether smoothing is negatively associated with total risk, for what matter we pose the following hypotheses:

H_{02}: There is no relationship between the artificial income smoothing and the total risk.

H_{a2}: The companies that engage in artificial income smoothing benefit from less total risk than those that do not pursue this behaviour.

3.3.2. Income Smoothing and the Company's Value

A great deal of research into income smoothing postulates that this is reflected into an investors' more favourable evaluation of the company. Among the several arguments put forward to explain the expected enhanced value of the company, there is that of stable earnings being a tool that signals management quality to the market, i.e., consistent levels of reported earnings are thought of as a way to signal a company's quality (Ronen and Sadan, 1981; Gibbins *et al*., 1990; Chaney and Lewis, 1995; Bhat, 1996)[4]. For all of these, we postulate that the market value of a company is positively associated with the magnitude of reduction in its earnings volatility through income smoothing. The emerging hypotheses are presented below:

H_{03}: There is no relationship between the artificial income smoothing and the market value.

H_{a3}: The companies that engage in artificial income smoothing benefit from enhanced market value as compared to those that do not pursue such a behaviour.

[4] For further details see, for example, Gordon (1964), Trueman and Titman (1988), Chalayer (1994), Wang and Williams (1994), Hunt *et al*. (1995) and Chaney and Lewis (1998), who present different arguments for the expected enhanced value of the company as a result of income smoothing.

3.3.3. Income Smoothing and the Political Visibility

The positive accounting theory has added new variables to explain companies' accounting choices and, as such, to understand the income smoothing practices carried out. One of the hypotheses nested in this theory[5] relates the income smoothing practices to the political visibility of the company and the political costs emerging from greater public scrutiny.

It is generally assumed that companies with greater political visibility are more likely to smooth their income since income fluctuations draw the attention of the public powers. On the one hand, a substantial increase in income may signal monopolistic behaviour, and, on the other hand, noticeable reductions may be perceived as a signal of crisis. In both cases, the public powers are prone to react, which might impose costs (Moses, 1987).

It is widely established in the literature that public visibility and the inherent costs are associated with the size of the company. Hence, it has been argued and empirically supported that larger companies, being subject to enhanced scrutiny from the government and the public in general, have greater incentive to smooth their income (*v.g.*, Moses, 1987; Craig and Walsh, 1989; Chalayer, 1994; Michelson *et al.*, 1995, 2000; Iñiguez and Poveda, 2004).

Given the aforementioned, the hypotheses underlying our statistical test are as follows:

H_{04}: There is no relationship between the artificial income smoothing and the size of the company.

H_{a4}: The companies that engage in artificial income smoothing are larger than those that do not pursue such a behaviour.

3.3.4. Income Smoothing and the Company's Leverage

The positive accounting theory has also puts forth the hypothesis that debt contracts, particularly, their covenant-rich nature, affect a company's accounting choices. More specifically, this theory asserts that when debt contracts include restrictive terms attached to financial figures, companies will prefer those accounting methods that enhance the reported earnings so as to minimise chances of failing to comply with any covenants (White *et al.*,

1997). Nevertheless, Trueman and Titman (1988) included debt in their agency model, shareholders/creditors, as a smoothing predictor. These authors showed that a small volatility in earnings lowers the assessment of the probability of a company's bankruptcy and, therefore, decreases the company's cost of borrowing. From this point of view, the issuance of debt provides an incentive for a company to smooth its reported earnings. Therefore, and similarly to Chalayer (1994), we test if the probability of bankruptcy associated with leverage differs according to whether or not a company engages in income smoothing; we also test if income smoothing leads to a lower amount of interest borne.

The hypotheses underlying the former test are the following:

H_{05}: There is no relationship between the artificial income smoothing and the likelihood of bankruptcy.

H_{a5}: The companies that engage in artificial income smoothing benefit from lower likelihood of bankruptcy as compared to those that do not pursue such a behaviour.

The hypotheses of the latter test are stated below:

H_{06}: There is no relationship between the artificial income smoothing and the amount of interest borne.

H_{a6}: The companies that engage in artificial income smoothing bear a lower amount of interest as compared to those that do not pursue such a behaviour.

Alongside, Chalayer (1994) claims that those companies that exhibit a high probability of bankruptcy have less incentive to smooth their income since in such a situation on issuing new debt creditors will not forego a relatively high interest rate. Thus, the point made by Chalayer (1994) is that for the income smoothing to yield a positive effect over the amount of interest borne it is required a low leveraged position. Therefore, according to Chalayer (1994), a highly leveraged company that engages in income smoothing will bear a similar level of interest to that of companies that are equally leveraged though they do not engage in income smoothing. Following Chalayer (1994), we expect that companies that engage in income smoothing be less leveraged than those that do not exhibit this behaviour:

[5] According to the original hypothesis developed by the positive accounting theory, the greater a company's visibility the greater is its tendency to choose accounting methods that reduce the reported income, and, consequently, the political pressures (White *et al*., 1997).

H_{07}: There is no relationship between the artificial income smoothing and the amount of debt in a company's capital structure.

H_{a7}: The companies that engage in artificial income smoothing have a less leveraged position as compared to those that do not pursue such a behaviour.

We do not test the hypothesis in the positive accounting theory according to which a company's accounting choices are related to the existence of management remuneration contracts whose terms refer to financial figures (bonus plan hypothesis). This is because in Portugal it is extremely difficult to obtain access to the features of management remuneration contracts. Therefore, next we propose a relationship between the income smoothing practices and the company's (1) ownership structure (concentrated *versus* diffuse), (2) activity sector, and (3) profitability.

3.3.5. Income Smoothing and the Company's Ownership Structure

The development and growth of companies has contributed to an increasing separation of ownership and control. Shareholders have a decreasing opportunity to interfere with the company's control which results in an increased decision making power of managers.

Consistently, myriad empirical studies (e.g. Kamin and Ronen, 1978; Koch, 1981; Amihud, *et al*., 1983; Beattie *et al*., 1994; Chalayer, 1994; Carlson and Bathala, 1997; Godfrey and Jones, 1999) provide evidence for that management-controlled companies (MCC) (i.e., companies with a diffuse ownership structure, whose manager(s) is(are) in charge of making decisions on behalf of shareholders) exhibit lower fluctuations in earnings than owner-controlled companies (OCC) (i.e., companies characterised by a concentrated ownership structure, and therefore, an overlap between ownership and management).

This relationship has been put down to a number of factors. All of them are inspired by the fact that, as underlined in Carlson and Bathala (1997), management-controlled companies are generally characterised by a reduced vigilance on the part of their owners (shareholders), and hence, managers of companies with widely diffuse ownership structure have more discretion to alter reported income in such a manner as to enhance their own personal welfare. Firstly, managers may desire to keep the owners of the company satisfied in order to secure their own positions within the company. Contrarily, this job-oriented manipulation of earnings does not take place at owner-controlled companies since

managers, in the capacity of owners, do control the company (Smith, 1976; Salamon and Smith, 1979; Koch, 1981; Carlson and Bathala, 1997). Secondly, the manager may be moved by the desire to reduce the perceived systematic risk (beta) because its reduction may not be meaningful for a company that exhibits a concentrated ownership structure and that is not listed in the stock market (Koch, 1981). Thirdly, managers of companies with a diffuse ownership structure may engage in smoothing practices to reduce the information asymmetries between management and capital owners, thereby signalling their expectations about the company evolution. This need does not apply so much to those companies with concentrated ownership structure. The capital owners of the latter usually benefit from a direct access to the company, out of which they are well aware of its operational and economic conditions, and, as such, these capital owners do not depend on any reported information to build their forecasts (Koch, 1981; Beattie *et al*., 1994). Lastly, as stated by Chalayer (1994), it is very common that the remuneration within companies with a widely diffused ownership structure is attached, directly or indirectly, to the accounting figures in order to encourage managers to act in the best interests of shareholders. Thus, a compromise between the interests of managers and those of shareholders may consist of an income smoothing policy that assures a stable growth of both the accounting income and the manager's remuneration, alongside a stable growth of shareholders' dividends.

From the above, we draw the following hypotheses:

H_{08}: There is no relationship between the artificial income smoothing and the company's ownership structure.

H_{a8}: The companies with a diffuse ownership structure (management-controlled) engage more in artificial income smoothing than the companies with a concentrated ownership structure (owner-controlled).

3.3.6. Income Smoothing and the Company's Profitability

Some previous studies have also included the company's profitability among the set of potential predictors of the income smoothing phenomenon. Yet, empirical evidence of the relevance of this variable remains inconclusive. On the one hand, some studies support that less profitable companies are more prone to smooth reported income (e.g. Archibald, 1967; White, 1970; Ashari *et al*., 1994). This could be ascribed to that smoothing conveys the notion of a controlled decline, whereas a great variability attached to negative performances may trigger an enhanced perception of risk by investors and creditors, and, consequently,

their loss of trust on management (White, 1970). On the other hand, Carlson and Bathala (1997) find evidence that the more profitable companies are the more opportunities managers have to assure the normalization of their income streams. Carlson and Bathala's (1997) argument is that those companies exhibiting a recurring weak yearly performance usually find less tools available to smooth their income. Thus, according to them, the ability of companies to smooth income is, to a large extent, dependent on the availability of revenue generating events, and so, depends on the company's profit potential.

Given the controversial results around the relationship between income smoothing and profitability, we perform a two-tailed test:

H_{09}: There is no relationship between the artificial income smoothing and the company's profitability.

H_{a9}: The companies that engage in artificial income smoothing exhibit a different profitability level from that of companies that do not engage in income smoothing.

3.3.7. Income Smoothing and the Activity Sector

The sector in which companies operate is frequently referred to as a further potential determinant of the degree of income smoothing. Previous research suggests that companies operating in different sectors or industries do smooth their income to differing extents (e.g. Ronen and Sadan, 1981; Belkaoui and Picur, 1984; Ashari *et al*., 1994; Kinnunen *et al*., 1995; Michelson *et al*., 2000; Iñiguez and Poveda, 2004). It is likely that companies belonging in certain sectors have greater opportunity and are more predisposed to smooth their income since the internal features (e.g. size, ownership structure) and the impact of exogenous factors (such as economic cycles, government regulations, etc.) may vary from sector to sector.

In line with the two-digit classification proposed by the Euronext Lisbon, this study comprises two dummy variables to accommodate the activity sectors under study: trade and/or industry *versus* services; new economy *versus* old economy.

The relevant hypotheses under test are as follows:

H_{010}: There is no relationship between the artificial income smoothing and the sector in which the company operates.

H_{a10}: The companies that engage in artificial income smoothing operate in different sectors from those of companies that do not engage in income smoothing.

3.2. VARIABLES MEASUREMENT

Appendix 2 lists the independent variables selected to operationalise each of the ten hypotheses above stated.

The dependent variable in this study is income smoothing. The procedure employed to infer the presence of income smoothing behaviour is based on the coefficients of variation method pioneered by Eckel (1981). Eckel's methodology has been replicated by many researchers to test the occurrence of income smoothing, including the recent studies of Albrecht and Richardson (1990), Ashari *et al.* (1994), Booth *et al*. (1996), Carlson and Bathala (1997), Michelson *et al*. (1995, 2000). Nevertheless, unlike these studies and following Iñiguez and Poveda (2004), we propose an income smoothing index whose numerator is the object of smoothing (Income Before Taxes) and whose denominator is a control measure formed by the part of income which we consider to be free from accounting discretion, labelled "Income Free from Accounting Discretion". Thus, the income smoothing index used in this study is defined as follows:

$$\text{Income Smoothing Index (ISI)} = \frac{CV_{\Delta IBT}}{CV_{\Delta IFAD}}$$

Where:

ΔIBT = Yearly change in the Income Before Taxes over the period 1995-1999[6].

$\Delta IFAD$ = Yearly change in the "Income Free from Accounting Discretion" over the period 1995-1999.

$CV_{\Delta Xi}$ = Coefficient of variation for the yearly change in the variable X_i, which, according to Eckel (1981), is equivalent to the standard deviation of the yearly change in the variable X_i divided by its expected value:

$$CV_{\Delta Xi} = \frac{\sqrt{\frac{\sum(\Delta X_i - \overline{X}_i \Delta)^2}{n-1}}}{\overline{X}_i \Delta}$$

Taking the above together, the ISI can be defined as follows:

[6] This is our period of study, whose justification is addressed in section 3.4.

$$ISI = \frac{\frac{\sqrt{\frac{\sum(\Delta IBT - \overline{IBT}\,\Delta)^2}{n-1}}}{\overline{IBT}\,\Delta}}{\frac{\sqrt{\frac{\sum(\Delta IFAD - \overline{IFAD}\,\Delta)^2}{n-1}}}{\overline{IFAD}\,\Delta}} = \frac{CV_{\Delta IBT}}{CV_{\Delta IFAD}} \qquad [1]$$

The part of income that we consider to be free from accounting discretion is not directly observable. Therefore, this variable is proxied by adjusting certain items in the financial statements. Drawing from Iñiguez and Poveda (2004) and from a contents analysis of the sample companies' audit reports[7], we began with the Income Before Taxes and any revenues, expenses, and extraordinary items considered to be prone to accounting manipulation, were adjusted. Thereby we obtained an estimate of the companies' income in presence of reduced accounting discretion. The proposed adjustments are described below:

Income Before Taxes (IBT) [2]

-/+ Extraordinary income

+ Depreciation and amortization (including the amortization of consolidation fund)

- Capitalized interests and capitalized differences on exchange

+ Variation in provisions

- Variation in expenses to be distributed over several years

+ Variation in revenues to be distributed over several years

-/+ Changes in accounting policies with impact on the reported earnings

-/+ Inadequate accounting practices with impact on the reported earnings and being worth of a qualified opinion from the auditor (on the SAC and EAR) in the form of qualification or emphasis

≅ ***Income Free from Accounting Discretion (IFAD)*** [3]

The adjustments displayed above include some of the variables suggested by Iñiguez and Poveda (2004). The last two variables are original and stem from our contents analysis

[7] In Portugal, there are two sorts of audit reports required for publicly listed companies: the *Certificação Legal das Contas* (Statutory Audit Certification - SAC) and the *Relatório do Auditor Externo* (External Auditor Report - EAR). As such, we carried out a contents analysis of the SAC and the EAR for each of the forty sample companies for every year comprised by the period of study (five years). In Mendes and Rodrigues (2005) are presented in detail the results of such analysis.

of the SAC and the EAR. The relevance of the adjustments carried out was corroborated from the mentioned further analysis we made to the auditors' opinions (CLC and RAE).

Briefly, on the basis of the above proposal, the artificial income smoothing practices are represented by an income smoothing index [1], composed of the coefficient of variation for the yearly change of the series in [2] and [3] over the period 1995-1999, whose absolute value is below 1. Thus, if $CV_{\Delta IFAD} > CV_{\Delta IBT}$ this means that the income free from any discretionary accounting items potentially manipulated (IFAD) exhibits greater variation than the income that includes all accounting items prone to manipulation (IBT). In this case, one may infer that some of the accounting variables considered to be susceptible of accounting manipulation (displayed between [2] and [3]) have been employed to reduce the variability of the IBT.

3.3. SAMPLE SELECTION AND DATA SOURCES

We gathered a sample of Portuguese companies listed in the Main Market of Euronext Lisbon[8] to study the income smoothing behaviour.

Since it is well established in the literature that the smoothing phenomenon should be studied over long time spans (e.g. Copeland, 1968; Eckel, 1981; Moses, 1987; Chalayer, 1994), we aimed to sample those companies listed over a 10-year's period (1993-2002). In so doing, the following prerequisites had to be fulfilled: (1) the core activity is not finance, insurance or alike since the corresponding economic and accounting regulations are substantially different from the other economy sectors; (2) the companies are listed during the whole study period and there are publicly available reports and yearly accounts for each of the ten years involved; (3) there have been no significant changes within the companies over the study period (e.g. mergers, changes to the fiscal year, and so on). These perquisites reflected in a sample size of forty for the period 1995-1999. To advance or to go ahead of these years would only allow very few companies to take part in the study, thereby preventing univariate and multivariate tests from being performed. The sample companies are listed in Appendix 1.

The data were collected from a number of sources: the yearly reports and consolidated accounts[9] placed in the Stock Exchange, the DATHIS database, and, finally, the yearbook published by the Stock Exchange.

[8] While the Stock Exchange is currently labelled Euronext Lisbon, back in our study period this was named Stock Exchange of Lisbon.

3.4. STATISTICAL METHODS EMPLOYED

In addition to the methods used to compute the Income Smoothing Index, we employed a range of statistical methods to examine the factors associated with income smoothing. Specifically, following a search for outliers that could bias tests results, we carried out both an univariate and a multivariate analysis[10]. The univariate analysis was aimed at uncovering significant differences between those companies engaged in income smoothing practices and those that do not adhere to such a behaviour. To this end, we performed the t-test on those income smoothing explanatory variables that were continuous and followed a Bell-shaped distribution; the Mann-Whitney test was reserved for the continuous, non-normal, variables; and, finally, the chi-square test was carried out when the variables were dichotomous. The next stage consisted of a multivariate analysis in order to establish whether the previously defined income smoothing explanatory variables altogether accounted for the probability of a given company to smooth its reported income. We ran a logistic regression because the dependent variable is dichotomous, taking on value 1 if the company is engaged in income smoothing, and value 0 if otherwise.

4. RESULTS AND DISCUSSION

In this section we present and discuss the empirical results of our study, namely those emerging from the use of the smoothing index as defined in section 3.2, as well as the results of the univariate and multivariate analyses.

4.1. SMOOTHING MEASURE

The computation of the smoothing index (defined in [1]) for the forty sample companies over a time period of 5 years, allowed isolating two groups:

- Group I- *the smoothers*: 24 companies (60%) with a smoothing index below 1, i.e., whose income before taxes is less volatile than the income adjusted through the potentially manipulated discretionary accounting items. Thereby there is evidence that these items are employed to smooth the reported income (IBT).

[9] In the case of four companies the consolidated accounts were not available for the whole 5-year's period. However, we decided not to discard these companies for the sake of the sample size; instead, we kept them and analysed their individual accounts.

[10] After the analysis of univariate outliers, we dropped the 'activity sector 2' variable (refer to Appendix 2) since one of its categories (old economy) comprised 90% of the observations. In such cases it is advisable to exclude the variables for the tight concentration of observations in one category deteriorates the correlations with the remaining variables (Tabachnick and Fidell, 2001).

- Group II- *the non-smoothers*: 16 companies (40%) with a smoothing index above 1. Subsequently, there is no evidence that they resort to discretionary accounting items to assure income normalisation.

The above result is in agreement with the bulk of international studies in that it provides neat support to the hypothesis that there is an outstanding tendency towards smoothing the reported income (60%), in this case, in the context of the Portuguese listed companies. Particularly, our finding underlines the accounting or artificial nature of income smoothing by revealing that managers manipulate a set of available accounting instruments with the purpose of assuring the stabilization of the income streams.

4.2. UNIVARIATE ANALYSIS

We performed an univariate analysis aimed at comparing the mean value/rank of the continuous variables[11] in each of the independent sample groups (smoothers *versus* non-smoothers). Specifically, we inspected whether mean differences were significant and according to our expectations. The normality assumption was evaluated prior to performing the statistical tests: (1) where the distribution of the variable does not deviate significantly from normality, the independent samples t-test was performed; (2) otherwise, the corresponding non-parametric Mann-Whitney test was performed (Field, 2000; Kinnear and Gray, 2001; Pestana and Gageiro, 2003). The results from the normality tests (Kolmogorov-Smirnov and Shapiro-Wilk*)* are presented in Table 1.

[11] The continuous variables are SYSTR, TOTR, PER, PCE, SHAR, NTAS, TVOL, MARV, SOLV1, SOLV2, INTB, BEBT1, DEBT2, OPMA, ROE and ROA (Appendix 2).

TABLE 1

NORMALITY TESTS

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
SYSTR	.124	40	.122	.954	40	.106
TOTR	.068	40	.200	.976	40	.548
PER	.125	40	.117	.971	40	.396
PCE	.125	40	.117	.940	40	.035
SHAR	.059	40	.200	.976	40	.537
NTAS	.324	40	.000	.430	40	.000
TVOL	.322	40	.000	.539	40	.000
MARV	.376	40	.000	.398	40	.000
SOLV1	.272	40	.000	.757	40	.000
SOLV2	.279	40	.000	.741	40	.000
INTB	.394	40	.000	.273	40	.000
DEBT1	.230	40	.000	.802	40	.000
DEBT2	.188	40	.001	.873	40	.000
OPMA	.235	40	.000	.752	40	.000
ROE	.264	40	.000	.621	40	.000
ROA	.106	40	.200	.963	40	.214

From Table 1 one concludes that the only variables that are normally distributed (p-value >.05, Shapiro-Wilk test[12]) are SYSTR, TOTR, PER, SHAR and ROA. Therefore, the t-test is performed on these variables; the Mann-Whitney test is conducted on the remaining. Table 2 displays these univariate test results.

[12] The SPSS output provides the Kolmogorov-Smirnov and Shapiro-Wilk tests of normality together. However, when sample size is small, in general the Shapiro-Wilk test is more accurate than the Kolmogorov-Smirnov test (Field, 2000).

TABLE 2

UNIVARIATE TEST RESULTS

Variables	t-test				Mann-Whitney test					
	M_0	M_1	t	Sig. (2-tailed)	R_0	R_1	Mann-Whitney U	Wilcoxon W	Z	Sig. (2-tailed)
SYSTR	.57010	.45221	1.405	.168						
TOTR	.02618	.02702	-.509	.614						
PER	20.3942	20.0419	.185	.854						
PCE					22.94	18.88	153.00	453.00	-1.077	.282
SHAR	.00051	.00065	-.696	.491						
NTAS					22.00	19.50	168.00	468.00	-.663	.508
TVOL					21.31	19.96	179.00	479.00	-.359	.720
MARV					21.81	19.63	171.00	471.00	-.580	.562
SOLV1					20.75	20.33	188.00	488.00	-.110	.912
SOLV2					20.50	20.50	192.00	492.00	.000	1.000
INTB					15.00	24.17	104.00	240.00	-2.429	.015
DEBT1					21.13	20.08	182.00	482.00	-.276	.782
DEBT2					20.75	20.33	188.00	488.00	-.110	.912
OPMA					22.19	19.38	165.00	465.00	-.745	.456
ROE					20.69	20.38	189.00	489.00	-.083	.934
ROA	2.44281	2.43542	.008	.994						

Notes:

M_0= Mean in the group of non-smoothers

M_1= Mean in the group of smoothers

R_0= Mean Rank in the group of non-smoothers

R_1= Mean Rank in the group of smoothers

A close look at Table 2 reveals that the degree of income smoothing is associated with a single variable, which is the proportion of interest borne (p-value <.05, two-tailed). While this is statistical evidence to reject the null hypothesis $H_{06,}$ surprisingly enough the mean rank of interest borne by those companies that engage in smoothing strategies is higher than the mean rank of interest borne by non-smoothers ($R_1 > R_0$). In sum, the relationship is of opposite direction to that we predicted. This may be interpreted in light of the fact that, as underlined in Chalayer (1994), creditors are rational, i.e., since they take into account the influence of the accounting income smoothing operations over income variance they are prompted to demand higher interest rates from smoothers. It is also important to note that this occurs when, according to Table 2, the bankruptcy probability (SOLV1 and SOLV2) and the leverage degree (DEBT1 and DEBT2), are not significantly different in the two groups of companies, which enhances once again creditors rationality.

The parametric and non-parametric tests do not provide support to our postulates concerning the relationship between the smoothing practices, on the one hand, and the risk, value, political visibility, and profitability, on the other hand. Indeed, since the mean

values/ranks of the variables selected to operationalise each hypothesis are not significantly different in the two groups of companies (p-values >.05) we cannot reject the null hypotheses (H_{01}, H_{02}, H_{03}, H_{04}, and H_{09}).

The ownership structure (OWNS1 and OWNS 2) and the activity sector (SECT1) are dummy variables in this study. Thus, their relationship with income smoothing is evaluated through the Chi-square (χ^2) non-parametric test as this is more appropriate when one seeks to detect whether there is a significant association between two categorical variables (Field, 2000). The Chi-square test results are presented in Table 3.

Analysis of Table 3 (Panel 2) reveals a significant relationship between the artificial income smoothing and both the ownership structure (p-values = .022 and .045) and the sector in which the company operates (p-value= .018)[13].

Consistently with our expectations, Panel 1 shows that when ownership structure is measured by OWNS1 the proportion of smoothers is higher where shareholders do not hold more than 30% of the company's stock (84.6%). The same goes for variable OWNS2. These results corroborate our premise that the smoothing behaviour is more typical of companies with a diffuse share ownership, which is in accordance with Carlson and Bathala's (1997) argument that in these companies there is a less tight control meaning the manager benefits from greater freedom to make accounting choices that allow reporting the desired income.

Furthermore, following the bulk of related research (e.g. Ashari *et al*., 1994; Kinnunen *et al*., 1995; Michelson *et al*., 2000; Iñiguez and Poveda, 2004), our test results indicate that companies from different sectors smooth their income in varying degrees (Panel 2). Particularly, income smoothing strategies are more frequently found at those companies that operate in trade and/or industry (78.9%), whereas 57.1% of companies operating in the services sector do not exhibit a smoothing behaviour (Panel 1).

[13] On requesting the Pearson Chi-square test from SPSS, the output provided includes other Chi-square based tests such as the Likelihood Ratio. The literature recommends the latter be relied upon when sample size is small (Field, 2000; Pestana and Gageiro, 2003). In this particular study, however, whenever the Likelihood Ratio indicated significance, the p-value from the Pearson Chi-square test was below .05 as well.

TABLE 3

CHI-SQUARE TEST RESULTS

Panel 1: ***Crosstabulation***

		SMOOTHING		Total
		0	1	
OWNS1	0	15,4%	84,6%	100,0%
	1	51,9%	48,1%	100,0%
OWNS2	0	28,0%	72,0%	100,0%
	1	60,0%	40,0%	100,0%
SECT1	0	57,1%	42,9%	100,0%
	1	21,1%	78,9%	100,0%

Panel 2: Chi-square tests

	Value	df	Sig. (2-tailed)
OWNS1			
Pearson Chi-square	4.862	1	.027
Likelihood Ratio	5.286	1	.022
OWNS2			
Pearson Chi-square	4.000	1	.046
Likelihood Ratio	4.003	1	.045
SECT1			
Pearson Chi-square	5.414	1	.020
Likelihood Ratio	5.602	1	.018

4.3. MULTIVARIATE ANALYSIS

We developed a logistic regression model where the independent variables are the previously analysed variables and the dependent is whether or not there is income smoothing. The goal is to evaluate whether the research variables provide an explanation for the probability of a given company to engage in smoothing behaviour, as individually or jointly considered.

Having ascertaining the absence of multicollinearity[14] we defined a logistic regression model composed of every dimension pertaining in the income smoothing phenomenon. Each dimension (e.g. systematic risk, total risk, value, etc.) was proxied by a

[14] The possible existence of multicollinearity was evaluated by means of the Pearson correlation coefficients among the predictors (refer to Appendix 3 for details).

single measured variable, which was the one that exhibited the lowest correlations with the remaining in the model.

Our model is presented below; within brackets, we display the expected sign for the relationship between the corresponding variable and the income smoothing behaviour:[15]

$$Y = \alpha + \beta_1 \underset{(-)}{SYSTR} + \beta_2 \underset{(-)}{TOTR} + \beta_3 \underset{(+)}{SHAR} + \beta_4 \underset{(+)}{NTAS} + \beta_5 \underset{(+)}{SOLV2} + \beta_6 \underset{(-)}{INTB} + \beta_7 \underset{(-)}{DEBT2} + \beta_8 \underset{(-)}{OWNS1} + \beta_9 \underset{(?)}{ROA} + \beta_{10} \underset{(+)}{SECT1}$$

Where:

Y = Income smoothing dummy variable (= 1 if the company falls into the smoothers group; 0 if the company falls into the non-smoothers group)

α = Intercept

SYSTR = Systematic risk

TOTR = Total risk

SHAR = Shares' returns

NTAS = Net total assets

SOLV2 = Solvency ratio 2

INTB = Proportion of interest borne

DEBT2 = Debt ratio 2

OWNS1 = Ownership structure dummy variable 1 (= 1 if stock ownership is concentrated; 0 if otherwise)

ROA = Return on Assets

SECT1 = Activity sector dummy variable 1 (= 1 if trade and/or industry; 0 if services sector)

The results from estimating the logistic regression model are shown in Table 4.

Concerning the model's goodness-of-fit, Panel 1 of Table 4 shows that 61.4% of the variability of the dependent variable is explained by the independent variables included in

[15] Analysis of Appendix 3 reveals that the correlation coefficients among the predictors included in the model are mostly small, which is good evidence of absence of serious multicollinearity. Notwithstanding, when interpreting the estimated model we validate the results by searching for any collinearity between predictors possibly biasing the results. Particularly, we compare for each predictor its zero-order correlation with the dependent variable (Appendix 3) against its regression coefficient (Table 4) in terms of size and sign.

the model as jointly considered[16]. Panel 2 of the same Table provides an alternative measure to evaluate model fit: the Hosmer and Lemeshow test, where a good fit is signalled by non-significance (Field, 2000; Kinnear and Gray, 2001). Therefore, the obtained p-value = .071 for the χ^2 test is further evidence of a good model fit. What is more, 85% of the model classifications are correct (Panel 3 of Table 4): (i) the model provides a correct classification of 12 out of the 16 companies that do not engage in income smoothing behaviour, i.e., there is a 75% model success rate; (ii) the model provides a correct classification of 22 out of the 24 companies that engage in income smoothing behaviour, which gives a 91.7% success rate for this group of companies; (iii) overall, the model performance is 85% [(12+22)/40]. In addition, the χ^2 test on the regression coefficients (Panel 4 of Table 4) indicates the model is globally significant (p-value = .007), i.e., the independent variables provide a significant contribution to the explanation of the dependent variable.

The Wald test and corresponding p-values evaluate the significance of the logistic regression coefficients (Panel 5 of Table 4), and in this particular case, they indicate some of the predictors under study make a significant contribution to explain the likelihood of companies to smooth their income.

Firstly, Panel 5 of Table 4 reveals there is a negative relationship between the artificial income smoothing and the systematic risk (H_{01}, p-value <.05, two-tailed test), which is consistent with the bulk of extant empirical research (e.g. Lev and Kunitzky, 1974; Chalayer, 1994; Michelson *et al*., 1995; Iñiguez and Poveda, 2004). This finding adds evidence to the premise that companies are prompted to engage in income smoothing practices in order to reduce risk perception by investors.

[16] Table 1 (Panel 1) displays two statistics similar to the coefficient of determination (R^2) that are based on the likelihood logarithmic function. Yet the Nagelkerke R Square is the one that is closest to the R^2 since it is an adjusted version of the Cox and Snell R Square; it rescales this latter statistic to cover the whole interval from 0 to 1. Therefore, our interpretation of the results is solely based on the Nagelkerke R Square (Kinnear and Gray, 2001; Tabachnick and Fidell, 2001).

TABLE 4

LOGISTIC REGRESSION RESULTS

Panel 1: Model summary

-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
29.599	.455	.614

Panel 2: Hosmer and Lemeshow test

Chi-square	df	Sig.
14.426	8	.071

Panel 3: Classification table

Observed		Predicted		
		Smoothing		Percentage
		0	1	correct
Smoothing	0	12	4	75.0
	1	2	22	91.7
Overall percentage				85.0

Panel 4: Test of model coefficients

Chi-square	df	Sig.
24.242	10	.007

Panel 5: Variables coefficients and related statistics

	β	Standard Error (S.E.)	Wald	df	Sig.	Exp (β)
SYSTR	-6.850	3.477	3.882	1	.049**	.001
TOTR	-219.564	159.820	1.887	1	.169	.000
SHAR	2522.365	1425.813	3.130	1	.077*	.
NTAS	2.028e-8	1.035e-8	3.840	1	.050*	1.000
SOLV2	-1.625	1.125	2.089	1	.148	.197
INTB	.275	.205	1.809	1	.179	1.317
DEBT2	-.006	.005	1.296	1	.255	.994
OWNS1	-2.523	1.185	4.535	1	.033**	.080
ROA	-.524	.321	2.667	1	.102	.592
SECT1	4.431	1.871	5.606	1	.018**	83.976
Constant	7.417	5.434	1.863	1	.172	1663.920

Notes:
*** Significant with p-value < .01 (2-tailed)
** Significant with p-value < .05 (2-tailed)
* Significant with p-value < .10 (2-tailed)

Secondly, statistical results confirm our expectation that there is a positive relationship between the artificial income smoothing and the company market value (H_{03}, p-

value <.05, one-tailed test[17]). As explained in the literature, this means that income smoothing leads to a more favourable investors' evaluation of the involved companies.

Thirdly, the regression results suggests that as the company's size increases, there is a corresponding increase in the probability of the company being an income smoother (H_{04}, p-value <.05, one-tailed test). This particular result may be understood in light of previous empirical findings that large companies exhibit a markedly superior political visibility and, as such, they are subject to both the government and the general public scrutiny to a greater extent; hence, they have a stronger motivation to smooth their reported earnings (Moses, 1987; Craig and Walsh, 1989; Chalayer, 1994; Michelson *et al*., 1995, 2000; Iñiguez and Poveda, 2004).

Fourthly, corroborating our preliminary finding from the univariate analysis, as the proportion of shares held by shareholders increases (above 30%) the tendency to smooth the reported income decreases (H_{08}, p-value <.05, two-tailed test). As theoretically argued, there is a negative relationship between the artificial income smoothing and a company's ownership structure, particularly, a concentrated ownership structure.

Fifthly, the results from the logistic regression are in accordance with those from the univariate analysis in that the sector in which a company operates does make a contribution to explain the probability to artificially reduce income fluctuations ($H_{010,}$ p-value <.05, two-tailed test). The positive sign attached to the 'SECT1' variable coefficient indicates that those companies pertaining in the trade and/or industry sectors are more prone to smooth their income. Likewise, previous studies reveal that the propensity to smooth income varies from sector to sector (e.g. Ronen and Sadan, 1981; Belkaoui and Picur, 1984; Ashari *et al*., 1994; Kinnunen *et al*., 1995; Michelson *et al*., 2000; Iñiguez and Poveda, 2004).

Sixthly, we cannot reject the null hypothesis that there is lack of a relationship between the artificial income smoothing and the amount of interest borne ($H_{06,}$ p-value =.179, two-tailed test). It shall be recalled that this is in contrast with the Mann-Whitney test result performed in the previous section, which indicated significance for this relationship.

Finally, consistently with the parametric and non-parametric test results (section 4.2.), the logistic regression model reveals lack of significance for the postulated dependence of the income smoothing on the (1) total risk (p-value = .169, two-tailed), (2)

[17] Where prior hypothesis states the direction of the relationship one-tailed tests should be performed, in which case a p-value smaller than .10 is enough to indicate significance at p-value <.05 (Field, 2000; Kinnear and Gray, 2001; Pestana and Gageiro, 2003).

probability of bankruptcy (p-value = .148, two-tailed), (3) leverage degree (p-value = .255, two-tailed), and (3) profitability (p-value = .102, two-tailed).

Robustness of the effects as well as ubiquity of lack of the indicated postulated effects were suggested by consistency between the logistic regression model (Table 4) and the zero-order correlation analysis (Appendix 3). Specifically, the non-significant predictors exhibit very small correlations with the dependent variable, whereas the significant predictors correlate substantially more with the dependent variable and there is consistency as to the direction of the relationship.

5. CONCLUSIONS

This study provides empirical evidence to that income smoothing is a behaviour typical of the Portuguese companies listed in the Euronext Lisbon (60% of the companies do engage in this sort of behaviour).

The univariate analysis points out that the incidence of income smoothing is higher at the management-controlled companies (i.e., with diffuse stock ownership) and at those companies that operate in the trade and/or industry sectors. Furthermore, the univariate analysis adds evidence to the rationality of creditors' hypothesis: for equivalent estimated probabilities of bankruptcy and leverage degrees, the companies that pursue smoothing strategies on average bear higher interest rates than those companies that do not exhibit such behaviour. This is indicative that creditors are attentive to the manipulations employed by companies aimed at normalising their income streams.

The multivariate analysis validates the univariate results (except for the point concerning the proportion of interest borne) and introduces further explanatory factors of the practices employed by companies to stabilise the reported income. The multivariate results do not support the rationality of investors since smoothers are regarded as being less risky (systematic risk) and they benefit from a more favourable evaluation of investors than non-smoothers. This could mean that investors over-rely on the bottom income reported by the accounting system and they do not take into consideration the fact that different methods may be employed to work out the final figure, and, possibly, to manipulate it. In short, investors are not aware or they prefer to ignore that accounting income smoothing can only produce an artificial reduction of the reported income variability. Such behaviour, according to Craig and Walsh (1989: 233), is consistent with the 'Naive Investor/Functional Fixation Hypotheses'. On the other hand, the multivariate analysis corroborates the vastly discussed

hypothesis in the literature that the political costs stemming from the interaction between the companies and the public powers are higher for large companies, which moves them to smooth their income in an attempt to avoid these political costs.

Both the univariate and multivariate analyses do not support the evidence gathered by previous studies since results do not reveal a significant relationship between the artificial income smoothing, on the one hand, and the (1) total risk, (2) probability of bankruptcy, (3) debt level, and (4) profitability, on the other hand.

Like any other research, ours also suffers from keenly felt lacunas. Therefore, our findings should be interpreted in light of the shortcomings associated with both the sample and the research method employed. These limitations suggest possible avenues for future research.

Firstly, sample size is small. Not only the population of Portuguese listed companies is small *per se*, but also, this is subject to ongoing changes, which also prevented the study of a longer period. Thus, our study could be the extended by drawing a sample of companies listed in different countries. This would allow statistical tests to be more robust as much as create an opportunity for a comparative analysis among countries in terms of the incidence and motivations behind income smoothing practices.

As to the research method employed, the following points are worth mentioning:

(i) While the index employed to detect a smoothing behaviour is very popular among previous studies and does the job, it may miss some companies that try to smooth their income artificially. In addition, this index does not measure the proportion in which the selected discretionary accounting items, possibly subject to manipulation, contribute to smooth reported income;

(ii) Although our choice of variables follows extant research, the conclusions of this study could possibly be different had other proxies been selected to operationalised the hypotheses;

(iii) Only secondary data available from the annual reports and financial statements could be collected. Consequently, this study excludes from any consideration some variables whose contribution to explain the smoothing behaviour should have been evaluated drawing on theoretical grounds (e.g. the manager's remuneration scheme, and other motivations besides those associated with risk and value);

(iv) This study leaves unaddressed the issue of whether the smoothing practices are guided by 'opportunistic' or 'signalling' purposes since this lies outside the scope of our research as defined at the outset.

Some of the above-mentioned caveats could be overcome if personal interviews were conducted in future research. On the one hand, it would be important to interview accounting experts (such as auditors and accountants) to gather their opinions about the existence of income smoothing behaviour, and to invite them to specify accounting variables subject to manipulation. On the other hand, face-to-face interviews with managers could provide a better understanding of their motivations and the instruments employed to achieve their goals.

Despite a number of weaknesses, we believe the findings from this study, by providing neat evidence that companies make use of accounting discretion to normalise their income streams, carry several practical implications, particularly, for the financial statements' users and the accounting standard setters. It is of utmost importance that financial statements' users, who rely on this tool to make decisions, be aware of the income smoothing phenomenon and the factors associated with this sort of behaviour. Self-evidently, the results from this study may enlighten financial statements' users to take the necessary precautions when interpreting the information conveyed by accounting figures. In addition, the accounting standard setters should question themselves about the opportunity of a less flexible regulation capable of restricting the discretion currently offered to managers in terms of accounting policy. The results of this study may also contribute to enhance companies' social responsibility and business ethic, as well as to enlighten the auditing profession.

To sum up, we hope this study, which refers to a country where research into the income smoothing phenomenon is virtually inexistent and a country that is economically and culturally different from those countries where this topic has often been investigated (e.g. USA, UK), may offer a contribution to extant literature on income smoothing.

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APPENDIX 1

LIST OF THE COMPANIES IN THE SAMPLE

1	Atlantis - Cristais de Alcobaça, S.A.
2	B.A. - Fábrica de Vidros Barbosa & Almeida, S.A.
3	Centralcer - Central de Cervejas, S.A.
4	CIMPOR - Cimentos de Portugal - SGPS, S.A.
5	CIN - Corporação Industrial do Norte, S.A.
6	Cires - Companhia Industrial de Resinas Sintéticas, S.A.
7	Colep Portugal - Embalagens, Produtos, Enchimentos e Equipamentos, S.A.
8	Companhia de Celulose do Caima, S.A.
9	Compta - Equipamentos e Serviços de Informática, S.A.
10	Corticeira Amorim - SGPS, S.A.
11	Efacec - Capital - SGPS, S.A.
12	Engil - SGPS, S.A.
13	Espart - Espírito Santo Participações Financeiras - SGPS, S.A.
14	Estoril-Sol, S.A.
15	F. Ramada - Aços e Indústrias, S.A
16	Fábrica de Porcelana da Vista Alegre, S.A.
17	Fisipe - Fibras Sintéticas de Portugal, S.A.
18	Imobiliária Construtora Grão-Pará, S.A.
19	Inapa - Investimentos, Participações e Gestão, S.A.
20	ITI - Sociedade de Investimentos Turísticos na Ilha da Madeira, S.A.
21	Jerónimo Martins - SGPS, S.A.
22	Lisgráfica - Impressão e Artes Gráficas, S.A.
23	Lusomundo - SGPS, S.A.
24	Modelo Continente - SGPS, S.A.
25	Mota & Companhia, S.A.
26	Mundicenter - SGPS, S.A.
27	Papelaria Fernandes - Indústria e Comércio, S.A.
28	Portucel Industrial - Empresa Produtora de Celulose, S.A.
29	Portugal Telecom, S.A.
30	Reditus - SGPS, S.A.
31	Salvador Caetano - Indústrias Metalúrgicas e Veículos de Transporte, S.A.
32	Semapa - Sociedade de Investimento e Gestão - SGPS, S.A.
33	Sociedade Comercial Orey Antunes, S.A.
34	Sociedade de Construções Soares da Costa, S.A.
35	Soja de Portugal - SGPS, S.A.
36	Somague - SGPS, S.A.
37	Sonae Indústria - SGPS, S.A.
38	Soporcel - Sociedade Portuguesa de Papel, S.A.
39	Sumolis - Companhia Industrial de Frutas e Bebidas, S.A.
40	Tertir - Terminais de Portugal, S.A.

APPENDIX 2

DESCRIPTION OF EXPLANATORY VARIABLES AND PROXIES

Hypothesis	Variable Name	Abbreviation	Measure
	Risk		
H_1	Systematic Risk	SYSTR	$\beta_i = \frac{Cov_{Ri,RM}}{\sigma^2_{RM}}$ Ri - Shares' daily returns for company i, over the period 1996-1999. R_M - Market' daily returns, over the period 1996-1999.
H_2	Total Risk	TOTR	Standard deviation of shares' daily returns for company i (Ri).
	Value		
H_3	Price Earnings Ratio	PER	$PER\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Last\ Quotation\ of\ the\ Year}{\frac{Net\ Income}{Mean\ Number\ of\ Shares}}$
H_3	Price Cash Earnings	PCE	$PCE\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Last\ Quotation\ of\ the\ Year}{\frac{Cash\ Earnings}{Mean\ Number\ of\ Shares}}$
H_3	Shares Returns	SHAR	Mean shares' daily returns for company i (R_i).
	Size		
H_4	Net Total Assets	NTAS	$Net\ Total\ Assets\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} Net\ Total\ Assets$
H_4	Trade Volume	TVOL	$Trade\ Volume\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} Trade\ Volume$
H_4	Market Value	MARV	$Market\ Value\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} Market\ Value$
	Leverage Level		
H_5	Solvency Ratio 1	SOLV1	$Solvency\ Ratio\ 1\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Net\ Total\ Assets}{Total\ Liabilities}$
H_5	Solvency Ratio 2	SOLV2	$Solvency\ Ratio\ 2\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Total\ Equity}{Total\ Liabilities}$
H_6	Proportion of Interest Borne	INTB	$I/TD\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Interest\ Borne}{Total\ Debt} \times 100$
H_7	Debt-to-Equity Ratio 1	DEBT1	$D/E\ 1\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Total\ Debt}{Total\ Equity} \times 100$
H_7	Debt-to-Equity Ratio 2	DEBT2	$D/E\ 2\ (Mean) = \frac{1}{4}\sum_{1996}^{1999} \frac{Total\ Liabilities}{Total\ Equity} \times 100$
	Ownership Structure		
H_8	Ownership Structure 1	OWNS1	1 Concentrated ownership structure if one individual shareholder or a dominant group of shareholders holds more than 30% of the company's stock (OCC). 0 Diffuse ownership structure if one individual shareholder or a dominant group of shareholders does not hold more than 30% of the company's stock (MCC).
H_8	Ownership Structure 2	OWNS2	1 Concentrated ownership structure if one individual shareholder or a dominant group of shareholders holds more than 50% of the company's stock (OCC). 0 Diffuse ownership structure if one individual shareholder or a dominant group of shareholders does not hold more than 50% of the company's stock (MCC).

APPENDIX 2 (CONT.)
DESCRIPTION OF EXPLANATORY VARIABLES AND PROXIES

Hypothesis	Variable Name	Abbreviation	Measure
	Profitability		
H_9	Operating Margin	OPMA	$Operating\ Margin\ (Mean) = \frac{1}{4} \sum_{1996}^{1999} \frac{Operating\ Income}{Sales\ and\ Sevices\ Provided} \times 100$
H_9	Return on Equity	ROE	$ROE\ (\ Mean\ ) = \frac{1}{4} \sum_{1996}^{1999} \frac{Net\ Income}{Total\ Equity} \times 100$
H_9	Return on Assets	ROA	$ROA\ (\ Mean\ ) = \frac{1}{4} \sum_{1996}^{1999} \frac{Net\ Income}{Net\ Total\ Assets} \times 100$
	Activity Sector		
H_{10}	Activity Sector 1	SECT1	1 Trade and/or industry 0 Services
H_{10}	Activity Sector 2	SECT2	1 New economy 0 Old economy

APPENDIX 3
CORRELATION MATRIX

		Smoothing	SYSTR	TOTR	PER	PCE	SHAR	NTAS	TVOL	MARV	SOLV1	SOLV2	INTB	DEBT1	DEBT2	OWNS1	OWNS2	OPMA	ROE	ROA	SECT1
Smoothing	Pearson Correlation	1																			
	Sig. (2-tailed)	.																			
SYSTR	Pearson Correlation	-.222	1																		
	Sig. (2-tailed)	.168	.																		
TOTR	Pearson Correlation	.082	-.175	1																	
	Sig. (2-tailed)	.614	.281	.																	
PER	Pearson Correlation	-.030	.071	.052	1																
	Sig. (2-tailed)	.854	.661	.750	.																
PCE	Pearson Correlation	-.230	.310	.057	.384*	1															
	Sig. (2-tailed)	.153	.052	.725	.014	.															
SHAR	Pearson Correlation	.218	.003	.292	-.228	-.138	1														
	Sig. (2-tailed)	.177	.984	.067	.156	.395	.														
NTAS	Pearson Correlation	.244	.578**	.074	.088	.218	.003	1													
	Sig. (2-tailed)	.130	.000	.649	.590	.177	.983	.													
TVOL	Pearson Correlation	-.134	.649**	.097	.208	.396*	-.047	.845**	1												
	Sig. (2-tailed)	.408	.000	.550	.197	.011	.772	.000	.												
MARV	Pearson Correlation	.002	.538**	.087	.102	.230	.005	.984**	.857**	1											
	Sig. (2-tailed)	.988	.000	.595	.532	.153	.976	.000	.000	.											
SOLV1	Pearson Correlation	.007	.044	-.410**	.142	.171	-.150	-.052	-.155	-.032	1										
	Sig. (2-tailed)	.966	.789	.009	.382	.292	.355	.749	.339	.847	.										
SOLV2	Pearson Correlation	.027	-.003	-.360*	.136	.154	-.176	-.063	-.167	-.037	.991**	1									
	Sig. (2-tailed)	.869	.986	.022	.401	.343	.277	.698	.303	.819	.000	.									
INTB	Pearson Correlation	.176	.006	-.081	-.001	.015	-.099	-.079	-.110	-.072	.577**	.612**	1								
	Sig. (2-tailed)	.277	.969	.619	.993	.928	.545	.628	.499	.659	.000	.000	.								
DEBT1	Pearson Correlation	-.112	.118	.421**	.032	.127	.180	.034	.114	.023	-.539**	-.542**	-.194	1							
	Sig. (2-tailed)	.493	.468	.007	.846	.435	.267	.837	.482	.890	.000	.000	.230	.							
DEBT2	Pearson Correlation	-.094	.159	.452**	-.050	.023	.125	.014	.138	.002	-.642**	-.637**	-.123	.864**	1						
	Sig. (2-tailed)	.562	.327	.003	.759	.886	.443	.930	.395	.991	.000	.000	.449	.000	.						
OWNS1	Pearson Correlation	-.349*	-.135	-.263	-.223	.046	-.113	-.225	-.095	-.194	.013	.028	-.280	-.113	-.195	1					
	Sig. (2-tailed)	.027	.407	.101	.166	.778	.487	.162	.559	.230	.939	.866	.080	.487	.228	.					
OWNS2	Pearson Correlation	-.316*	.080	-.201	-.050	.222	-.233	.007	.169	.019	.157	.156	-.142	-.139	-.204	.537**	1				
	Sig. (2-tailed)	.047	.626	.213	.760	.170	.147	.965	.297	.906	.334	.336	.382	.392	.207	.000	.				
OPMA	Pearson Correlation	-.175	.218	-.365*	-.152	.027	-.150	.296	.196	.310	.175	.142	-.080	-.442**	-.344*	.128	.147	1			
	Sig. (2-tailed)	.280	.177	.021	.351	.868	.356	.064	.225	.051	.280	.383	.624	.004	.030	.431	.364	.			
ROE	Pearson Correlation	.131	.019	-.444**	-.089	-.244	-.082	.180	.223	.191	.020	.005	.014	-.599**	-.389*	-.018	.127	.510**	1		
	Sig. (2-tailed)	.421	.908	.004	.584	.129	.615	.267	.166	.238	.903	.977	.931	.000	.013	.914	.434	.001	.		
ROA	Pearson Correlation	-.001	.117	-.310	-.260	-.126	.064	.244	.227	.285	.066	.052	-.027	-.422**	-.302	.135	.047	.745**	.698**	1	
	Sig. (2-tailed)	.994	.472	.052	.105	.437	.693	.130	.159	.074	.685	.749	.867	.007	.058	.407	.772	.000	.000	.	
SECT1	Pearson Correlation	.368*	-.224	-.054	-.067	-.110	-.190	-.267	-.320*	-.239	.233	.267	.178	-.193	-.248	.019	.090	-.187	-.004	-.037	1
	Sig. (2-tailed)	.020	.164	.741	.680	.499	.240	.096	.044	.138	.148	.096	.271	.233	.123	.909	.579	.248	.978	.822	.

Notes:
** Correlation is significant at the .01 level (2-tailed).
* Correlation is significant at the .05 level (2-tailed).