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Evidence for Private Portuguese Firms

José A. C. Moreira[ξ]

Assistant Professor

Faculty of Economics / University of Porto

Rua Roberto Frias • 4200-464 Porto / Portugal

Tel: 00.351.225 571 272 • Fax: 00.351. 225 505 050

E-mail: jantonio@fep.up.pt.

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Abstract

In this paper I test two intuitions. First, that small private firms have incentives to undertake earnings management. Second, that firms' financing needs are one of such incentives, constraining the sense of the income manipulation. The tax incentive is deemed to motivate firms into adopting income decreasing actions aimed at reducing the tax bill, and is especially strong in an environment where they are managed by the owners and with close alignment between the accounting and tax systems. However, the debt incentive, which tends to affect mainly those firms with high financing needs, is expected to act as a constraint to the adoption of income decreasing actions, given that firms want to signal their quality to banks.

The empirical evidence obtained from a sample of small private Portuguese firms fully supports my intuitions, showing that firms with low financing needs tend to focus on the minimization of the tax bill. Those with high needs are more pervasive in reporting larger profits. Moreover, firms with audited accounts seem to show a lower likelihood of reporting profits, and tentative explanations are either that they are more constrained in adopting earnings management actions, or that audited accounting may act as a signal of their quality, a kind of substitute for the signal underlying the sign and size of reported earnings.

Keywords: earnings management, incentives, income tax, small firms, Portugal.

Data availability: data are available from the commercial sources identified in the paper.

JEL: M41, C21, L29.

1. Introduction

Accounting literature presents detailed discussion and empirical evidence on firms' incentives underlying earnings management. Healy and Whalen (1999) condense them into three main groups: capital market, contractual and anti-trust or government regulation incentives. Albeit implicitly, this list seems to imply that private firms, and those that are not obliged to attain or avoid specific accounting numbers imposed by contract clauses or by regulation, have no incentive to undertake earnings management. However, they have (e.g. Kosi et al., 2006**;** Blake and Salas, 1996; Baralexis, 2004; Burgstahler et al., 2006). The fact is that the literature tends to be biased towards a setting of big listed companies acting in a "common-law" environment (Ball et al., 2000), giving an incomplete picture of firms' incentives to manage earnings.

In this paper I test two intuitions. First, that small private firms acting in a different institutional context also have incentives to undertake earnings management. Second, that firms' financing needs is one of such incentives, constraining the sense of their income manipulation.

The Portuguese economic and legal context underlying the sample I use is characterized by three main determinants: i) there is a strong alignment between ownership and management, which means that most of the firms are managed by the owners and thus are not affected by (management) agency problems; ii) firms raise their financial funds directly from banks, and are not constrained by (formal) debt covenants; iii) the legal environment is structured as "code-law", in the sense described by Ball et al. (2000), and there is a close alignment between the accounting and tax system.

In such a context firms face two main incentives for undertaking earnings management.[1] First of all, they are motivated to minimize their income tax bill, adopting actions intended to reduce reported earnings (e.g. Kosi, 2006). A second incentive relates to firms' relationships with the banks that grant them the funds they need. Although firms

[1] Schipper (1989) and Healy and Wahlen (1999), amongst others, define earnings management as being the outcome of managers' use of judgment in financial reporting and in structuring transactions to alter financial reports with the intent of obtaining a specific gain for themselves or for their firms. This means that earnings management is deemed to be done within the flexibility allowed by accounting rules, although the definition does not preclude other situations considered as illegitimate (e.g. Baralexis, 2004; Dechow et al., 1996). Anecdotal evidence suggests that small Portuguese firms adopt both legitimate and illegitimate forms of earnings management, which are indistinguishable for an external observer like the researcher. I elaborate further on this issue in the following section.

are not attached to debt covenants clauses, the probability of obtaining enough financing tends to be positively connected to the quality of their accounting numbers (e.g. Baralexis, 2004; Missonier-Piera, 2004). Thus, this second incentive tends to motivate firms into adopting accounting choices that have an opposite impact on reported earnings to that related to taxes.

Given these incentives, I expect firms to undertake earnings management. Those having high financing needs are predicted to adopt more income increasing actions, or at least fewer income decreasing ones, than their counterparts that do not depend so heavily on banks for their financing. The latter are expected to be motivated mainly by the minimization of income tax, supporting my intuition that firms' financing needs tend to act as a counter-incentive to such a minimization.[2]

Burgstaher and Dichev (1997), hereafter referred to as BD (1997), DeGeorge et al. (1999) and Gore et al. (2001), amongst others, analyze the distribution of net income based on the assumption that in the absence of earnings management such distribution is smooth. They find graphical and statistical evidence that there is an unusually high frequency of firms in earnings intervals immediately to the right of zero (a discontinuity at the right), and an unusually low frequency in those to the left (a discontinuity at the left). Using earnings levels and earnings changes as their variables, they take these unexpected frequencies as evidence that firms manage their earnings to avoid earnings losses or earnings decreases.[3] I adopt a similar approach to test the predictions in the current paper, using the extended version of BD's (1997) methodology proposed in Moreira (2006) to control for the effect of firms' financing needs on their earnings management behavior. Moreover, given Dechow et al. (2002) and Beaver et al.'s (2003) comments on such a methodology, I test the robustness of the results and the intuition on the connection between earnings management and financing needs using econometric models.

The empirical evidence supports my expectations. The global distribution of net income shows discontinuities both at the left and at the right of zero. However, the graphical

[2] In some sense, the role of the bank system in motivating private firms' earnings management is similar to that of capital markets for listed companies.

[3] The evidence in Beatty et al. (2002), related to the bank industry, corroborates that those unexpected frequencies (discontinuities) are driven by firms' earnings management. However, Dechow et al. (2002) do not find evidence that the discontinuities were driven by discretionary accruals. More recently, Beaver et al. (2003) argue that the discontinuities at zero seem to be partly driven by the asymmetric impact of income taxes and special items for loss and profit firms. Later in the paper I discuss these recent findings.

shape of the distribution shows that firms are highly concentrated in a few intervals close to zero, consistent with the incentive to minimize the tax bill. Controlling for firms' financing needs, the empirical distributions show that the discontinuity at the left is higher for firms with high needs, and at the right it is higher for those with low needs. This evidence, which is corroborated by the results of econometric models, is consistent with the prediction that there is an incentive associated with firms' financing needs, and that those with high needs ("high debt firms") tend to report higher profits and fewer losses.

These results are of importance for the academic community in general, and also for financial analysts and tax authorities. They add to a small set of research (e.g. Kosi, 2006; Burgstahler et al., 2006; Baralexis, 2004; Blake and Salas, 1996; Eilifsen et al., 1999) that studies the incentives underlying the earnings management process of small private firms in "code-law" countries.

The contribution of the paper to the literature is threefold. Firstly, it presents empirical evidence that the alignment between accounting and the tax system affects firms' earnings management behavior, supporting the analytical evidence in Eilifsen et al. (1999) and, more recently, the empirical evidence in Burgstahler et al. (2006). Under the circumstances, the minimization of the income tax bill is a target firms try to achieve. Secondly, it shows that even private firms suffer some kind of constraint on their actions towards earnings manipulation, driven by firms' financing needs and implicitly imposed by the banks that grant them the necessary funds. Thus, this evidence goes beyond Burgstahler et al.'s (2006) conclusions on the positive impact of capital markets on earnings quality, suggesting that the bank system tends to have a similar role concerning private firms' earnings. Thirdly, as far as I know, it is the first study on the subject based on the Portuguese economic and legal context, and one of the very few at European level that restricts the analysis of earnings manipulation to private companies.

The paper proceeds as follows. In the next section, I develop the hypotheses to be tested and briefly discuss the literature. In section 3, I introduce the research design and the sample selection. In section 4, I discuss the empirical results. Finally, in section 5, I draw a brief conclusion.

2. Literature review and development of the hypotheses

2.1. Earnings management incentives in literature

Amongst others, BD (1997), DeGeorge et al. (1999) and Beatty et al. (2002) for the USA, Gore et al. (2001), for the UK, find graphical and statistical evidence suggesting that firms manage their earnings to avoid small earnings losses or decreases. BD (1997) suggest an explanation for firms' earnings management behavior based on the higher costs they tend to face in transactions with stockholders when reporting earnings decreases or losses. These costs, which they assume may be higher for firms reporting losses than for those with decreases in earnings, act then as an incentive for firms' earnings management. This can be labeled as a capital market incentive, and, besides shareholders, includes analysts and prospective investors amongst its driving forces (e.g. Dechow et al., 2000, Teoh et al., 1998).[4]

Healy and Whalen (1999) mention two extra groups of incentives underlying earnings management: i) contractual incentives, which imply the existence of contracts imposing penalties if firms do not achieve given accounting numbers. For example, debt covenants that intend to constrain managers' behavior and avoid the wealth transfer from bondholders to shareholders (e.g. Sweeney, 1994); ii) anti-trust or government regulation incentives, which may take many different forms and specific motivations. For example, bank's incentives to avoid overcoming liquidity ratios imposed by the regulator (e.g. Beatty et al., 2002) or firms' incentives to be granted higher protection from imports (e.g. Jones, 1991).

The literature seldom mentions the reduction of the income tax bill as an incentive for earnings management.[5] It only approaches such an incentive in cases of firms' reactions to meaningful decreases in corporate tax rates (e.g. Boynton et al., 1992, Guenther, 1994). A potential explanation for such a subaltern treatment of taxes might be related

[4] There are some similarities between this incentive, and its underlying costs, and that of private firms in their relationship with the banks that grant the funds they need. Even the higher costs associated with loss reporting seem to hold.

[5] Beaver et al. (2003) relate tax and earnings management but in a different way from that which I discuss here. They argue that many of the discontinuities in the empirical distribution of earnings are driven by nondiscretionary earnings components, like the asymmetric impact for profit and loss firms of taxes and special items. Nevertheless, Burgstahler et al. (2006) acknowledges that the minimization of taxes may be an earnings management incentive when there is a close alignment between the accounting and tax systems.

to the relative degree of importance of such an incentive towards others like those mentioned above (e.g. Erickson et al., 2004).

The specific economic and legal context underlying the reality depicted in the papers makes all the difference. In effect, a great part of the literature on earnings management discusses incentives related to big listed firms acting in an environment characterized by i) having strong capital markets where firms collect most of the funds they need for their activities, ii) having a great level of independence between the accounting and the legal tax systems.

If one changes such an economic and legal environment, and considers private firms and a close alignment between accounting and income tax, the above incentives no longer apply. Now income tax minimization can be an important incentive (e.g. Kosi, 2006; Burgstahler et al., 2006; Baralexis, 2004; Eilifsen et al., 1999; Blake and Salas, 1996), motivating firms to take income decreasing actions. However, in such an environment, the relationship between firms and banks tends to create a different incentive, which motivates the former to report earnings that can signal their quality (e.g. Baralexis, 2004; Missionier-Piera, 2004). Acting this way, firms intend to keep banks' support to grant them the financing they need. Thus, firms with higher financing needs tend to be more motivated to undertaking income increasing actions or, at least, fewer income decreasing ones.

2.2. The incentives for earnings management of small private firms: the case of Portugal

Portugal is a very small "code-law" country. Its capital market lists a few tens of companies that can be classified as medium size by international standards. All others are very small, collect from the bank system most of the external funds they need for their activities, and tend to be managed by the owners. The accounting system is legally regulated and highly aligned with the corporate tax system. Companies are obliged by law to produce annual financial reports aimed at satisfying, primarily, the Tax Authority needs on the estimation of income taxes.

Private Portuguese firms have two main and distinct incentives to manipulate their earnings.[6] First of all, firms are motivated to minimize income tax. This works then as

[6] The literature tends to define earnings management as accounting choices made within the flexibility allowed by the accounting rules (e.g. Schipper, 1989, Healy and Wahlen, 1999). However, the literature also offers broader definitions that include illegitimate actions (e.g. Dechow et al., 1996; Baralexis,

an earnings management incentive given the mentioned connection between accounting rules and corporate tax law.[7] However, one cannot say that firms' ultimate objective is to report negative earnings. Two reasons restrain them from adopting such a stringent target. First, a few years ago, the Portuguese Tax Authority imposed on them a minimum tax payment set as a percentage of their revenue that is independent of reported earnings. This "special tax payment" (SP) is deductible from the (effective) due tax (T) based on taxable income, but is not refundable if the effective tax is lower than that payment. Thus, if T < SP, the corporate tax charge is SP; if T > SP, it is T. This regime implies that firms will have the same tax charge till a given level of reported earnings. The second reason is that the probability of firms having their accounting audited by that Authority is higher for firms reporting negative earnings. This fear may even press firms into adopting income increasing measures intended to avoid reporting losses.[8] Thus, income tax motivates firms to reduce their tax payment but not to have negative reported earnings.

A second incentive those firms have for managing earnings is related to their relationship with the bank system. Most firms have financial debt as the most important component of their external financing. Although firms are not attached to debt covenant clauses, the probability of obtaining the necessary funds at a reasonable cost is positively related to the quality of their accounting numbers, given that banks' credit decisions are based on firms' financial information. Thus, this second incentive tends to

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2004). For the firms in my sample, "earnings manipulation" follows a broad definition that includes legitimate and illegitimate actions. Given

i) the ownership and management structures;
ii) that the accounting and tax codes allow a very low level of flexibility in accounting choices;
iii) the existence of an "underground economy", which anecdotal evidence refers to as being as large as 25 percent of the "official" one;
iv) that not all firms are obliged to have their accounts audited,

firms might adopt illegitimate actions (deemed as fraud), such as underreporting their activity to reduce the tax bill (the amount of annual unpaid taxes is said to reach 7% of GDP). Because of the impossibility of separating in the analysis both components of manipulation, the analysis and discussion in the paper and the references to "earnings management" have to be understood as including both effects.

[7] For the sake of parsimony, I do not elaborate further on the benefits firms obtain from such a tax minimization, and on the reasons why tax may not be an incentive for firms in "common-law" countries where accounting and tax system are independent of each other.

[8] The low control of the Portuguese Tax Authority over firms accounting might thus affect the direction and amount of manipulation firms undertake. Baralexis (2004) reports a similar situation for Greece.

motivate firms into adopting accounting choices that provoke an impact on reported earnings in the opposite sense to that related to taxes.[9]

2.3. Development of the hypotheses[10]

As mentioned above, the tax incentive is expected to have a negative impact on reported earnings. The "special tax payment" and the fear of having their accounting audited by the Tax Authority constrain firms in reporting negative earnings. The net impact on earnings of this incentive, and of that on financing needs, will depend on the degree of firms' dependency on the bank system. However, unless a firm wants to hide financial difficulties, I expect that such an impact is negative, i.e. income decreasing. Thus, I expect an unusually high proportion of firms to report small positive earnings, and an unusually low proportion to report small losses. In terms of the empirical earnings distribution, this expectation is translated into the following hypothesis:

H1: Firms manage earnings to avoid losses and to minimize their income tax payment, reporting an unusually low number of small negative earnings and an unusually high number of small positive earnings.

This income decreasing incentive related to the tax payment is constrained by the debt incentive. Firms with high financing needs are expected to adopt fewer income decreasing actions than those with low needs, and to avoid more intensively reporting

[9] For companies that underreport their revenues to reduce (illegally) the tax bill, such an incentive tends to act as a counter-effect, a kind of discipline indirect and implicitly imposed by bank institutions. Baralexis (2004), for the Greek context, says that such discipline does not work given that banks have access to other (informal) sources of information of firms' quality.
The situation in Portugal tends to be different, moving away from a "relationship lending" (Berger and Udell, 2002). A few years ago, it was not uncommon to have companies producing two annual financial reports: the legal one, for the Tax Authority (minimizing the revenue and tax payment) and an informal one, depicting a picture of the firm (supposedly) closer to the reality, which could be used by banks in taking credit decisions. However, things have been changing as banks centralise their credit decisions and request from firms the delivery of the financial information used for tax purposes (the legal report). The Basel Accord implementation, and the underlying restructuring of banks that it imposes, tends to make firms' financial information of greater importance for credit decisions.

[10] DeGeorge et al. (1999) present the avoidance of losses as firms' main earnings management threshold. Although more recently Brown and Caylor (2005) find evidence suggesting that firms' earnings management thresholds evolve through time, such evidence is valid for big listed firms facing strong capital market incentives. Given the incentives discussed above, I do not expect that small private firms will have the avoidance of earnings decreases, or the achieving of earnings increases as an earnings threshold. Thus, I follow BD (1997) and restrict the analysis to the earnings level distribution. Nevertheless, I also performed some complementary tests for the global change in earnings distribution and found no evidence of earnings management for such a target.

negative earnings. Their intention is to report accounting numbers that signal to banks their quality and assure continuous financial support with low interest rates. I thus predict that these firms will tend to manage earnings downwards (upwards) in a less (more) pervasive way than other firms. This expectation is stated as follows:

H2: Firms with high financing needs manage earnings downwards in a less pervasive way, and avoid reporting losses in a more pervasive way, than firms with low financing needs.

In the next section I discuss the research design and the sample selection.

3. Research design and sample selection

3.1. Graphical analysis

To test the first hypothesis I use the methodology proposed by BD (1997).[11] It is based on the distribution of earnings and on the assumption that in the absence of earnings management such distribution is smooth. The empirical distribution is a histogram of the cross-sectional frequency of firm-years by intervals of the earnings variable.[12] The existence of earnings management to avoid earnings losses is expected to take the form of unusually low frequencies of small losses and unusually high frequencies of small profits.[13]

To test the null hypothesis that the distribution is smooth or, stated in the opposite way, that there are discontinuities around zero earnings, BD (1997) use a statistic based on the difference between the actual number of observations (firms-years) in an interval

[11] For a discussion of the limitations of this methodology in dealing with managers' incentives to undertake earnings management and the earnings targets they pursue see, amongst others, McNichols (2000).

[12] BD (1997) use intervals of deflated earnings. Given the empirical evidence in Durtschi and Easton (2005) that the deflation of earnings could distort the distribution, I use intervals defined in monetary units. However, I also tested for deflated earnings intervals and the results are qualitatively similar.

[13] In their study BD (1997) find discontinuities around zero in the earnings distribution and take it as evidence of earnings management. However, Beaver et al. (2003) argue that a great deal of the discontinuities is driven by nondiscretionary earnings components, like the asymmetric impact for profit and loss firms of taxes and special items, i.e. they are only a mechanical effect of the accounting process. Dechow et al. (2002) suggest that the discontinuities are unrelated to earnings management, because they do not match the correspondent discretionary accruals. However, there is also evidence, like in Beatty et al. (2002) that the discontinuities are, at least partly, related to earnings management.

and the expected number for that same interval, divided by the standard deviation of the difference. The latter is defined as follows:

$$std = \sqrt{Np_i(1-p_i) + \frac{N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1})}{4}},$$

where N is the total number of observations in the sample and p_i is the probability that an observation will fall into interval *i*. Under the null hypothesis of smoothness, such a statistic is distributed approximately normally with mean 0 and standard deviation 1. The expected number of observations for a given interval is defined as the average of the number of observations in the two adjacent intervals.[14]

To test the second hypothesis I use the extended version of BD (1997) methodology proposed in Moreira (2006) and based on the classification of each firm-year according to its financing needs status. The analysis is thus performed for sub-samples of low and high financing needs firm-year observations (i.e., low and high debt firms).[15]

3.2. Probit analysis

To overcome the criticisms made in recent papers about the graphical methodology (e.g. Beaver et al., 2003, Dechow et al., 2002) I use also a Probit model, like in Beatty et al. (2002). My aim is to test whether the effect of conservatism on firms' earnings management behavior holds after controlling for some of the effects that may drive the sign of earnings. It is thus a way of testing for differences between high and low financing needs firms in the management of small earnings and, at the same time, for the robustness of the results obtained from the graphical analysis.

The model I estimate is very parsimonious and focuses on the essential feature of the hypothesis being tested, the impact of firms' financing needs (DEBT):

$$INTERV_{it} = \alpha_0 + \alpha_1 DEBT_{it} + \alpha_2 LNI_{it} + \alpha_3 SIZE_{it} + \alpha_4 AUDIT_{it} + \sum \alpha_k YEAR_t + e_{it},$$

[14] This statistic has insufficiencies. For example, it does not work well for *maxima* or *minima* of the distributions. Moreover, if the null hypothesis of smoothness does not hold at zero, the standardized differences for the interval immediately left of zero and immediately right of zero are not independent. Yet the same insufficiencies apply to other similar statistics available in the literature like the one proposed by DeGeorge et al. (1999). However, the explicit nature of the graphical evidence helps to dilute the potential limitations of the statistic.

[15] The assumptions underlying this type of analysis, about the shape of the earnings distribution, may be questionable due to their lack of theoretical support. However, Hayn (1995) using a different research design finds similar kinds of discontinuities at zero earnings. One may always argue that such discontinuities may not be due to earnings management but to firms' achievement of "normal business

where: INTERV is a dummy variable that takes value 1 if the firm reports net income in the interval [0; 2[, value 0 if it is in [-2; 0[;[16] DEBT is a dummy variable that takes value 1 if the firm has a debt ratio (financial debt/total assets) higher than the median of the distribution, 0 otherwise; LNI is a dummy variable that takes value 1 if prior period net income is positive, 0 otherwise; SIZE is the natural logarithm of current total assets; AUDIT is a dummy variable that takes value 1 if the accounting report is audited, 0 otherwise; ΣYEAR is a set of dummy variables, taking a value one if the firm-year corresponds to the year, zero otherwise; i,t are firm and year (1999-2004) indexes, respectively.

The intuition underlying the variables included in the model is appealing. DEBT is a proxy for firms' financing needs. If a firm has a high current debt ratio one might expect that it will also have high financing needs in future periods, making it extremely important to keep banks' financial support and low interest rates. Given the above discussion about the debt incentive, I expect a positive relation between firms' financing needs and the probability of reporting positive earnings ($\alpha 1 > 0$). If the evidence corroborates this expectation, this is a strong result because of debt negative impact on earnings through interests. LNI controls for prior period earnings sign. The positive correlation between earnings of consecutive periods (e.g. Wysocki, 2006) make it more likely that firms that had prior period positive earnings also have positive current earnings ($\alpha_2 > 0$). If large firms are more profitable, at least in absolute monetary terms, they have a higher propensity to be located on the right hand side of the earnings distribution. Moreover, as mentioned in BD (1997) and Baralexis (2004), medium and large firms tend to do more extensive earnings management to avoid losses, although for reasons different from those that motivate the companies in my sample. I expect, then, the coefficient on this variable to be positive ($\alpha_3 > 0$). AUDIT controls for the quality of accounting reporting, and for the constraint on manipulation that may be imposed by auditors (e.g. Baralexis, 2004). Thus, I expect that it is less likely that a firm with negative pre-managed earnings will manipulate its accounts to report positive earnings, or will squeeze income towards zero if pre-managed earnings are positive,

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targets" (e.g. increase in sales, positive earnings). Given the specific incentives that affect the companies in my sample, I do not think this unresolved question will affect the rigor of the conclusions.

[16] The intervals are defined in thousands of Euros. Interval [0; 2[includes firm-years with reporting net income in between zero and two thousand Euros (exclusive).

when there is an auditor than otherwise ($\alpha_4 < 0$).[17] No prediction is assigned to the coefficients on ΣYEAR.

3.3. Regression analysis

To check the robustness of the evidence on the impact of financing needs on earnings I also apply a regression analysis, using the following model estimated by OLS:

$$SNI_{it} = \alpha_0 + \alpha_1 SDEBT_{it} + \alpha_2 SLNI_{it} + \alpha_3 SIZE_{it} + \alpha_4 AUDIT_{it} + \\ + \alpha_5 SDEBT * D_{it} + \sum \alpha_k YEAR_t + e_{it}$$

Its structure is very similar to the Probit model in the previous sub-section. Now I test whether the level of deflated earnings (SNI) around the center of the empirical distribution is affected by firms financing needs. I expect the coefficient on the debt ratio (SDEBT) to be negative ($\alpha 1 < 0$) because of the relationship between debt, interest and earnings. However, I also expect that the coefficient on the interactive variable controlling for the incremental impact of financing needs on earnings (SDEBT*D) is significantly positive. D is a dummy variable that takes value 1 if the observation belongs to interval [-2; 4[, zero otherwise.[18] All continuous variables in the model are deflated by total assets.

3.4. The earnings management degree of pervasiveness (*pp*)

As in Moreira (2006) I use the degree of pervasiveness to test the statistical significance of the differences in the discontinuities for the earnings distributions of low and high financing needs. Considering n_a^i as the number of actual firms in interval *i* (*i* = first interval at the left of zero; first interval at the right of zero) and n_e^i as the expected number of firms in that same interval in the pre-managed earnings distribution, I define firms' earning management degree of pervasiveness (*pp*) as the absolute value of the following ratio (proportion):

$$pp = \left| \frac{n_e^i - n_a^i}{n_e^i} \right|.$$

[17] Not all firms are obliged to have their accounts audited. Most of them are exempt. Only firms that meet the *criteria* defined by law (similar to those imposed in the 4th and 7th Directives of the European Union) are obliged to have their accounts audited.

This definition is similar to that used in BD (1997), and the same happens to the expectation of the number of observations in a given interval. Such an expectation is defined as the average of the actual number of observations in two adjacent intervals. Thus, the degree of pervasiveness appears as a proportion of the predicted number of firms undertaking earnings management in a given interval over the expected number of firms in such interval in the pre-managed earnings distribution.[19]

3.5. "Firms' financing needs": a definition

Banks use firms' accounting information to support decisions about potential future loan contracts. This means that the present is "certain" for firms concerning bank financial support, and the future is uncertain. Thus, firms' current earnings management behavior is expected to be affected by their future needs of loans (financing needs). However, in Portugal the relationship between banks and firms tends to be based on very short term contracts, usually six months long, implying at their end a reassessment of a firm's financial position and a decision on a potential renewal of the contract. This means that in such an environment firms' future is "today".

Bearing in mind such a contractual context, I use the ratio of financial debt (financial debt/total assets) as a proxy for firms' financing needs. The underlying assumption is that firms' future needs are no different from current ones, which is an appealing forecast given that a firm's financial position does not tend to change abruptly. The higher the ratio, the higher the firms' financing needs are expected to be.

3.6. Sample and descriptive statistics

The sample is collected from the SABI database and includes all available companies for the period 1998-2004.[20] All observations with relevant missing values and financial and listed companies are deleted. As in BD (1997), the upper and lower 1 percent of net

[18] I also tested for other intervals centered on zero earnings, of different size and up to 150 thousand Euros, and the conclusions are the same as those reported below.

[19] The literature does not offer clear evidence to guarantee that this measure is completely uncorrelated with the partition variable. If there were any correlation there would be a measurement error (McNichols and Wilson, 1988; Beaver et al., 2003). However, given that the research design adopted is based on the comparison of such a measure for two sub-samples, the measurement error, if any, may offset each other, at least partly. Moreover, given that I use graphical and statistical approaches simultaneously, I do not expect that the conclusions may be affected by any potential measurement error.

income and change in net income for each year are considered as missing. The final working sample has 51,561 observations. Table 1 explains in detail the selection process.

[TABLE 1]

Table 2 displays descriptive statistics for the global sample. In Panel A, the evolution of median and mean net income reflects the downturn of the Portuguese economy after 2001, but in a less drastic way than one could expect in an economy that has not shown signs of meaningful growth since then. This unexpected evolution is even more apparent when one looks at the percentage of positive reported earnings (%P) that is on average around 82 percent for the whole period and does not fall below 79 percent, although the median net income is only 20,000 Euros.[21] A potential explanation shall be sought in the way firms manipulate earnings, mixing legitimate (within the accounting standards) and illegitimate actions. The evidence in Panel D, where the two intervals immediately at the right of zero keep 22 percent of their observations from one year to the next, is consistent with this tentative explanation and with the incentive firms face to undertake earnings management intended to minimize the tax bill.[22] Still in Panel A, the median size of companies, measured by total assets, is around two million Euros, the average net return on assets is around 1 percent and the average financial debt is lower than 22 percent. The number of observations increases all along the sample period, but is always higher than 5,000, consistent with a recent database that is still being consolidated. In Panel B statistics are displayed by ranks of firms' financing needs (low/high debt ratio), for the whole sample and for a central interval. As expected, around zero high debt firms report higher mean earnings than low debt firms, and are of larger size. Panel C, shows pairwise correlations that fit the expectations.

[TABLE 2]

[20] SABI is the acronym for "Sistema de Análise de Balanços Ibéricos" (Iberian Balance Sheet Analysis System), and is a database from the Bureau van Dijk. The period chosen for the current study is justified by the availability of information in the database.

[21] In the US, for the same period, the companies in *Compustat* disks show around 65% of positive reported earnings, and the American economy was growing at high rates.

[22] Untabulated statistics show that the "crystallization" of the observations in the intervals immediately at the right of zero, around 22 percent, is very similar for the whole period and for each year of the sample. If one takes into account that throughout the period the economic conditions changed abruptly, from high growth in 1999 to its absence in 2004, then one has to conclude that such a "steady state" may not be due to chance.

4. Empirical results

4.1. Earnings management to avoid losses: graphical analysis

4.1.1. The discontinuities of the empirical distributions

Exhibit 1, Fig. 1.1, reports the (truncated) distribution of deflated earnings levels.[23] It uses an interval width of two thousand Euros.[24] As expected, the frequency discontinuities at zero are visible and, as shown in Table 3, have highly significant standardized differences (17.6 and -19.22, for the interval at the left and right of zero, respectively).[25] This evidence supports the prediction stated in the first hypothesis.[26] One has to pay attention to the shape of the right hand side of the distribution, which seems to have been "squeezed" against the "zero wall", consistent with the above discussed intuition and the predominance of the tax incentive over that of debt (at least at the centre of the distribution). Such a shape contrasts with that of Fig. 3 in BD (1997), which is skewed to the right and shows a very visible discontinuity in the interval at the left of zero. This is evidence of the difference in the incentives that affect each set of firms.

[EXHIBIT 1]

Fig. 1.2 shows jointly the distributions for low (bars) and high (line) debt firms' distributions. Although the scale of the picture does not allow a very clear visual comparison, the distribution of high debt (HD) firms is slightly skewed to the right, consistent with the higher incentive that these firms have to report positive earnings intended to signal firms' quality. The discontinuities at zero are visible in both

[23] The display of truncated distributions, rather than the complete ones, intends to highlight the aim of the analysis, which is the discontinuities around zero.

[24] The analysis was also re-performed using an interval width of one thousand up to five thousand Euros. The results are qualitatively similar.

[25] The standardized differences are higher than the maximum values tabulated in a standardized normal distribution. They are different from zero at less than 0.0001. Throughout the paper the significance of these statistics has to be assessed against 1.96 (the 5% two-tail z-stat for a standardized normal distribution).

[26] Although it is not the objective of the current paper, I also looked at the truncated distribution of change in earnings (not depicted). It does not show visible (or statistical) signs of earnings management for this threshold. This means that the target of firms in the sample does not seem to be reporting positive earnings changes. This evidence contrasts with that reported in BD (1997), which shows visible "kinks" for the change in earnings distribution and supports the above discussion on the difference in incentives for public and private companies.

distributions. The standardized differences reported in Table 3 corroborate the visual assessment. For the interval at the left (right) of zero they are 21.47 (-17.89) for low debt (LD) and 17.8 (-9.21) for HD distributions. It thus seems that the discontinuities are higher for LD firms. However, as BD (1997) point out, the comparison of the relative magnitude of those statistics has certain limitations to being used as a measure of the extent of earnings management. Although the differences reflect the proportionate discontinuity, they also depend on the number of observations, which varies across the earnings intervals and distributions. Thus, those differences cannot be directly compared with the purpose of assessing the pervasiveness of relative earnings management.

[TABLE 3]

The same is true when one looks in Table 3 at the number of firms that managed earnings around zero. Labeling as "N. Observ." the expected minus the actual number of observations in the interval, and defining the former as the average of the number of observations in the two adjacent intervals, it shows that the LD distribution has a higher (absolute) "N. Observ." than the HD distribution for both intervals around zero. At the left of zero the estimated number of firms undertaking earnings management to avoid losses is 687 for the LD distribution against 372 for the HD distribution. At the right, those estimates are 873 and 321, respectively.

In the following sub-section, I test statistically whether these estimates are different across distributions.

4.1.2. Differences in the earnings management degree of pervasiveness of High and Low Debt firms

In sub-section 3.4) I defined the earnings management degree of pervasiveness (*pp*) as a proportion of the number of firms in a given interval that undertakes earnings management over the expected number of firms in such an interval. This definition has two advantages over the measurement discussed in the previous sub-section. Firstly, it takes into account the number of observations in each interval and thus permits direct comparisons across earnings distributions and intervals. Secondly, it also allows statistical testing of the difference in pervasiveness between HD and LD firms.

[TABLE 4]

Table 4 displays the estimates of the degree of pervasiveness to avoid losses for both intervals around zero, and for HD and LD firms. The former have, at the left of zero interval, a higher degree of pervasiveness that is around 68 percent. That of LD firms is around 58 percent. Thus, there is a difference of around 10 percentage points between the degrees of both sets of firms. Using the statistical test for the difference between the proportions of success in two independent samples (Sandy, 1990) I find that such estimated difference is significant at less than 0.001. Hence, as predicted in hypothesis 2, HD firms show a higher degree of pervasiveness in avoiding earnings losses. Moreover, on the right interval, LD show higher pervasiveness (*pp* = 76.2 percent against 51.2 percent for HD firms, statistically different from each other), consistent with the higher incentive LD firms have for minimizing the tax bill, locating themselves close to zero, and also with the incentive HD firms have for reporting accounting numbers that signal their quality to banks.[27] This evidence is fully supportive of the second testing hypothesis and of the relative intensity of the earnings management incentives for HD and LD firms.

In sum, the empirical evidence collected so far fully supports the testing hypotheses stated above. First, the firms globally undertake earnings management, this meaning that the two incentives in place do not (completely) offset each other, and that the tax incentive seems to be stronger than that of debt. Second, HD firms manage earnings to avoid losses in a more pervasive way than LD firms, but tend to target their reported earnings to intervals not adjacent to zero. Their position in the empirical distribution is consistent with the financing needs hypothesis and also with the "special tax payment" mentioned in the previous section.

Although the empirical evidence is strong and consistent with my predictions, recent research (e.g. Dechow et al., 2002; Beaver et al., 2003) argues that the discontinuities in the earnings distributions may not be totally due to earnings management but to other reasons underlying those distributions. Despite the fact that the evidence in such research conflicts with the empirical results of other recent pieces of research supporting the earnings management explanation (e.g. Beatty et al., 2002), I perform a Probit analysis to test whether financing needs is a driving force of firms' higher earnings

management pervasiveness. The results of such an analysis are discussed in the following sub-section.

4.2. Earnings management to avoid losses: Probit analysis

Table 5 displays the results of a Probit analysis for the differential likelihood of reporting small profits versus small losses, across HD and LD firms. I estimate four models, which are the outcome of adopting two different levels of control for two different samples. Model 1 and Model 2 are estimated for a sample that includes the observations in the intervals adjacent to zero. Model 3 and Model 4 use a wider sample that includes the second interval at the right of zero. The intention of estimating the models for different but close samples is to assess the evidence discussed for the empirical distributions that HD firms tend to report earnings in intervals farther away from zero than LD firms.[28]

[TABLE 5]

In all models the coefficient on DEBT, the variable controlling for the impact of firms' financing needs on the manipulation to avoid losses, has the predicted sign and is significant. However, the coefficient in Model 3 is larger and has a higher level of significance than in Model 1. I read this as evidence that HD firms tend to place themselves in intervals farther away from zero than LD firms, consistent with the graphical evidence discussed above. HD firms not only avoid reporting losses but try to signal their quality to banks.[29] As expected, in both Model 2 and Model 4 prior period earnings sign (LNTI) positively affects the probability that current period earnings are of the same sign. The evidence displayed in Table 2, Panel D, showing the persistence of the observations in the intervals close to zero, corroborates the econometric result. SIZE does not have too much importance in explaining the probability of firms reporting positive earnings, given that its coefficient is insignificant in Model 2 and is very small in Model 4, contrasting with the suggestion in Baralexis (2004). Finally, AUDIT is negative and significant in both these models, consistent with the expectation that firms that have their accounts audited are less likely to report small profits. This

[27] Although it may not visible in Fig. 1.2, the interval with higher frequency is the second at the right for HD firms, the first for LD.

[28] The sample [-2; 2[has 30.8 percent of HD firm-years; the other sample, [-2; 4[has 33.7 percent.

[29] This attitude is similar to that of listed companies that report earnings intending to meet analysts' expectations (e.g. Dechow et al., 2000).

evidence seems to highlight the role auditors tend to play in circumventing firms' earnings manipulation behavior, particularly in the case I am studying where firms tend to manage their earnings by also adopting illegitimate actions. However, this evidence can also mean that firms with audited accounts are already giving their stakeholders a signal about the quality of their accounting information, and are not so pressed into signaling such a quality via the reporting of positive earnings. In subsection 4.3 I elaborate a little more on this issue.

In sum, the empirical evidence discussed in this sub-section corroborates that which was discussed in the previous sub-section and displayed in Tables 3 and 4. Firms with high financing needs are more likely to report positive earnings but do not do so to the minimum, given the incentive they have to signal their intrinsic quality to their banks. The existence of an auditor that certifies firms' accounts negatively affects the likelihood of a firm reporting positive earnings, because of the reasons discussed immediately above.

If firms' financing needs affect their likelihood of reporting a profit, as discussed, then I expect that such an effect is also apparent in the level of earnings that firms report. In the following sub-section, I use a model estimated by OLS to check whether the empirical evidence corroborates my expectation. It is also a complementary way of testing the relationship between firms' financing needs and their earnings management behavior.

4.3. The impact of financial debt on the level of reported earnings

Table 6 displays evidence on the incremental impact of firms' financing needs on the level of reported small profits. If firms' earnings manipulation is affected by the debt incentive, then in intervals at the right of zero the relationship between earnings (return on assets) and financing needs (ratio of debt) shall be different from other intervals. The results support my expectation. The interactive variable (SDEBT*D) controlling for such an incremental impact is positive and significant in both Models 2 and 3, meaning that in intervals at the right and close to zero the level of earnings is less negatively affected, even positively affected as in Model 3,[30] by the ratio of debt.[31] This evidence is

[30] In Models 2 and 3, the impact of Debt is the coefficient on SDEBT for firm-years outside the interval [0; 4[, i.e. -0.088 and -0.017 respectively; the sum of the coefficients on SDEBT+SDEBT*D for firm-years placed in such an interval, -0.036 and +0.017, respectively.

consistent with the intuition discussed so far and shows that firms with high financing needs not only tend to report more positive earnings but also to report higher earnings. The coefficients on AUDIT are negative in Models 1 and 2, meaning that firms with audited accounts tend to report lower earnings. This empirical evidence is consistent with the above tentative explanation about the potential role of audit as a signal of firms' quality. However, the positive sign of such a coefficient in Model 3 suggests that such an explanation do not hold for the centre of the distribution.

In sum, the evidence discussed in the current section strongly supports the hypotheses.[32]

[TABLE 6]

5. Conclusion

In this paper I test for the earnings management behavior of small private firms under tax and debt incentives. The tax incentive motivates firms into adopting income decreasing actions intended to reduce the tax bill. The graphical analysis depicted in Fig. 1.1 is very clear on it, showing the right hand side of the earnings distribution "squeezed" against the "zero wall". The small number of firms reporting small negative earnings seems to be the effect of the compulsory "special tax payment", and firms' fear of having their accounts audited by the Tax Authority in case of reporting losses. The results are consistent with the existence of such an incentive and support my first testing hypothesis.

The second incentive is debt related, directing firms' earnings management efforts in the opposite direction to that of the tax incentive. In an environment where firms collect most of their funds from banks, the way of keeping their support is by signaling them fims' quality. Thus, firms with high financing needs are expected to manipulate their earnings upward or, at least, less downwards than firms with low needs. The evidence fully supports the second hypothesis. The Probit analysis corroborates the graphical and statistical evidence, showing that the likelihood of reporting profits is higher for high

[31] This positive incremental impact of debt on earnings holds even when I enlarge the interval up to 150 thousand Euros.

[32] The robustness tests I performed include, namely, the use of different width intervals and different size sub-samples with trimmed and untrimmed outliers. The results are qualitatively similar to those displayed and discussed above.

debt firms, and that these firms tend to report positive earnings larger than the minimum. Firms with audited accounts seem to show a lower likelihood to report profits, and tentative explanations for such evidence are either that they are more constrained in undertaking earnings management actions or that having audited accounting is already a signal of firms' quality, a kind of substitute for the sign and size of reported earnings. The regression analysis, testing for the incremental impact of financing needs on the level of earnings, is another piece of corroborative evidence supporting the second hypothesis.

The contribution of the paper to the literature is threefold. Firstly, it presents empirical evidence that a close alignment between accounting and the tax system affects firms' earnings management behavior, supporting the analytical evidence in Eilifsen et al. (1999), which shows firms facing a dilemma: banks' financial support and low cost of capital *vis-à-vis* lower taxes. Under the aforementioned circumstances, the minimization of the income tax bill is a target firms try to achieve. Secondly, it shows that even private firms suffer some kind of constraint on their actions towards earnings manipulation, driven by firms' financing needs and implicitly imposed by the banks that grant them the necessary funds. Thus, this evidence goes beyond Burgstahler et al.'s (2006) conclusions on the positive impact of capital markets on earnings quality, suggesting that the bank system tends to have a similar role concerning private firms' earnings. It is like if this system acts as a controller of firms' earnings manipulation. Thirdly, as far as I know, it is the first study on the subject based on the Portuguese economic and legal environment, and one of the very few at European level that restricts the analysis of earnings manipulation to private companies only.

This study is of importance for the academic community, allowing a better perception of the incentives that move firms towards earnings management, but it is also very important for Tax Authorities. In specific contexts, such as the Portuguese, where tax evasion is a tough reality, a deep understanding of the incentives underlying firms' earnings management behavior may be an important weapon in the battle to eradicate the problem.

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Table 1: **Sample selection**

Description	**No. firm-years**
SABI (2006) database. All available companies for the period 1998-2004	139,202
After lagging variables and deleting missing observations	54,229
After deleting financial and listed companies	53,035
Basic working sample after trimming variables (Net Income and Change in Net Income) 1 percent top and bottom	51,561

Table 2. **Basic descriptive statistics**

Panel A. *Income, size and debt variables*

Variable	YEAR	MEAN	STD	MEDIAN	OBS	%P
Net Income	1999-2004	153.6	571.3	20.0	51,561	81.6
(NI)	1999	221.6	661.7	39.0	5,405	86.9
	2000	198.6	657.0	31.5	6,566	85.4
	2001	167.1	590.4	28.0	6,980	83.8
	2002	165.3	638.9	28.0	7,412	82.1
	2003	127.4	532.5	17.0	10,697	78.8
	2004	114.6	460.1	10.0	14,501	78.8
Total Assets (TA)	1999-2004	6,634.0	20,140.3	1,943.0	51,561	-
Financial Debt (FDEBT)	1999-2004	1,403.5	8,144.1	86.0	51,561	-

Note: Unless differently stated, all values are in thousands of Euros. %P is the percentage of positive reported earnings in the sample.

Panel B. *Income and size variables by ranks of low/high debt ratio*

Variable	Debt Rank	MEAN	STD	MEDIAN	OBS
Net Income					
Whole Sample	Low	171.1	610.9	14.0	25,781
	High	136.0	528.1	27.0	25,780
Intervals [-2; 4[	Low	1.1	1.4	1.0	4,307
	High	1.4	1.3	1.0	2,197
Total Assets					
Whole Sample	Low	4,461.4	15,035.3	947.0	25,781
	High	8,806.8	23,995,7	3,313.0	25,780
Intervals [-2; 4[	Low	565.6	2,687.5	130.0	4,307
	High	2,308.5	16,832.4	735.0	2,197

Note: The debt ratio is defined as financial debt over total assets. All values are in thousands of Euros.

Panel C. *Pearson (Spearman) Correlations coefficients above (below)*

	NI	TA	FDEBT
NI		0.40	0.14
TA	0.51		0.73
FDEBT	0.22	0.64	

Panel D: *Displacement of the observations from the previous to the current year, in the net income distribution*

	Current year intervals →					
Previous year ↓	**0** [0; 1[	**1** [1; 2[	**2** [2; 3[	**3** [3; 4[	**4** [4; 5[	**5** [5; 6[
Other Negative	0.14	0.12	0.10	0.09	0.09	0.11
-5 [-5; -4[	0.02	0.01	0.01	0.01	0.01	0.01
-4 [-4; -3[	0.01	0.01	0.01	0.01	0.01	0.01
-3 [-3; -2[	0.02	0.01	0.01	0.01	0.01	0.01
-2 [-2; -1[	0.03	0.02	0.02	0.02	0.01	0.02
-1 [-1; 0[	0.03	0.03	0.02	0.02	0.02	0.02
0 [0; 1[	0.22	0.10	0.07	0.05	0.05	0.04
1 [1; 2[	0.15	0.22	0.15	0.10	0.08	0.05
2 [2; 3[	0.09	0.11	0.14	0.12	0.08	0.07
3 [3; 4[	0.06	0.06	0.09	0.13	0.12	0.07
4 [4; 5[	0.03	0.06	0.05	0.09	0.10	0.08
5 [5; 6[	0.03	0.03	0.05	0.05	0.06	0.07
Other Positive	0.17	0.21	0.27	0.30	0.37	0.43
Total %	1.00	1.00	1.00	1.00	1.00	1.00
Number of obs.	1,127	1,838	1,542	1,329	1,163	982

Note: Except for the last line, the values are expressed in percentage of the total number of observations in each interval in the current year. The intervals are measured in thousands of Euros, and read as follows: [0; 1[contains the firm-years whose current net income is higher or equal to zero and lower than 1 thousand Euros. For this same interval, the first column has the origin of its current observations.

Table 3. **Statistical significance of the discontinuities around zero**

Figure	Distribution	Discontinuity at the …			
		… left of zero		… right of zero	
		"No. Observ."	Z1 statist.	"No. Observ."	Z1 statist.
1.1	NI Global (51,561 obs.)	1,059	*17.60*	-1,194	*-19.22*
1.2	NI Low Debt (25,781 obs.)	687	*21.47*	-873	*-17.89*
	NI High Debt (25,780 obs.)	372	*17.80*	-321	*-9.21*

Notes:

a) "NI Global" stands for the whole sample distribution of net income; "NI Low (High) Debt" for sub-sample of firm-year below(above) the median of the debt ratio (financial debt/total assets);

b) "N. Observ." equals the expected minus the actual number of observations in the interval. At the left of zero the interval width is [-2; 0[, at the right is [0; 2[, and the unit is one thousand Euros;

c) Like in BD (1997), the Z1 statistic tests the null hypothesis that the distribution of earnings is smooth. It is based on the difference between the actual number of observation in an interval and the expected number for that same interval, divided by the standard deviation of the difference. The latter is defined as follows:

$$std = \sqrt{Np_i(1-p_i) + \frac{N(p_{i-1}+p_{i+1})(1-p_{i-1}-p_{i+1})}{4}},$$

where N is the total number of observations in the sample and p_i is the probability that an observation will fall into interval *i*. Under the null hypothesis of smoothness, such a statistic is distributed approximately Normal with mean 0 and standard deviation 1. The expected number of observations for a given interval is defined as the average of the number of observations in two adjacent intervals;

d) The assessment of the significance of these statistics is made against 1.96. This number corresponds to a level of significance of 5% for a standardized normal distribution.

Table 4. **Differences in the degree of pervasiveness to avoid losses, for sub-samples of firms with low/high financing needs.**

Description	Discontinuity at the …			
	… left of zero		… right of zero	
	LD	HD	LD	HD
1. Number of actual firms	495	175	2,018	946
2. Number of expected firms	1,182	547	1,145	625
3. Pervasiveness $\lvert(2\text{-}1)/2\rvert$	0.580	0.680	0.762	0.512
4. Difference in pervasiveness	0.100		0.250	
5. Standard deviation	0.024		0.023	
6. Z2 Statistic [4/5]	4.01		10.58	
7. P-value	< 0.001		< 0.001	

Notes:

a) "Low (High) Debt" firm-years are those below (above) the median of the debt ratio (financial debt/total assets);

b) The expected number of observations for a given interval is defined as the average of the number of observations in two adjacent intervals. At the left of zero the interval width is [-2; 0[, at the right it is [0; 2[;

c) The Z2 statistic is the probability density function of the difference between the proportions of success in two independent samples (Sandy, 1990: chap. 10), and is distributed approximately Normal with mean 0 and variance 1. Under the null hypothesis of no difference in the proportions such a statistic is defined as follows:

$$Z2 = \frac{\hat{p}_{hd} - \hat{p}_{ld}}{std},$$

where the numerator is the difference between the proportions of "low debt" (LD) and "high debt" (HD) firms undertaking earnings management.
The standard deviation is estimated as:

$$std = \sqrt{\frac{\bar{p}(1-\bar{p})}{n_{ld}} + \frac{\bar{p}(1-\bar{p})}{n_{hd}}},$$

where n is the number of expected "low debt" (*ld*) and "high debt" firms (*hd*) in the interval. $\bar{p}$ is the pooled proportion of both samples:

$$\bar{p} = \frac{n_{hd}\hat{p}_{hd} + n_{ld}\hat{p}_{ld}}{n_{hd} + n_{ld}}.$$

d) The p-value underlying the critical value of the Z2 statistic are two-tailed;

Table 5. **Probit analysis: firms' financing needs and other determinants of earnings management to avoid losses**

$$INTERV_{it} = \alpha_0 + \alpha_1 DEBT_{it} + \alpha_2 LNI_{it} + \alpha_3 SIZE_{it} + \alpha_4 AUDIT_{it} + \sum \alpha_k YEAR_t + e_{it}$$

Independent variables	*Expected sign*	**Model 1** Coefficient *(p-value)*	**Model 2** Coefficient *(p-value)*	**Model 3** Coefficient *(p-value)*	**Model 4** Coefficient *(p-value)*
DEBT	+	0.172 *(0.07)*	0.172 *(0.00)*	0.213 *(0.00)*	0.160 *(0.00)*
LNI	+		0.546 *(0.00)*		0.597 *(0.00)*
SIZE	+		- 0.005 *(0.76)*		0.031 *(0.05)*
AUDIT	-		-0.222 *(0.02)*		-0.217 *(0.01)*
Sample		[-2; 2[interval		[-2; 4[interval	
No. firm-years		3,634		6,504	

Variable definitions: **Models 1 and 2**: INTERV is a dummy variable that takes value 1 if the firm reports net income in the interval [0; 2 [, value 0 if it is in [-2; 0 [; **Models 3 and 4**: INTERV is a dummy variable that takes value 1 if the firm reports net income in the interval [0; 4[, value 0 if it is in [-2; 0[; DEBT is a dummy variable that takes value 1 if the firm has a debt ratio (financial debt/total assets) higher than the median of the whole distribution, 0 otherwise; LNI is a dummy variable that takes value 1 if prior period net income is positive, 0 otherwise; SIZE is the natural logarithm of current total assets; AUDIT is a dummy variable that takes value 1 if the accounting report is audited, 0 otherwise; ΣYEAR is a set of dummy variables, taking value 1 if the firm-year corresponds to the year, 0 otherwise; i,t are firm and year (1999-2004) indexes, respectively.

Notes:

a) Intercept coefficients are untabulated, although for models 1 and 2 they are insignificant. Year intercept effects have been controlled in all models;

b) The p-values are two-tailed.

Table 6. **The impact of firms' financing needs on the level of reported earnings**

$$SNI_{it} = \alpha_0 + \alpha_1 SDEBT_{it} + \alpha_2 SLNI_{it} + \alpha_3 SIZE_{it} + \alpha_4 AUDIT_{it} + \alpha_5 SDEBT * D_{it} + \sum \alpha_k YEAR_t + e_{it}$$

Independent variables	*Expected sign*	**Model 1** Coefficient *(p-value)*	**Model 2** Coefficient *(p-value)*	**Model 3** Coefficient *(p-value)*
SDEBT	**-**	-0.083	-0.088	-0.017
		(0.00)	*(0.06)*	*(0.06)*
SLNI	**+**	0.192	0.192	0.037
		(0.00)	*(0.04)*	*(0.00)*
SIZE	**+**	0.012	0.012	-0.008
		(0.00)	*(0.00)*	*(0.00)*
AUDIT	**-**	-0.010	-0.010	0.005
		(0.00)	*(0.00)*	*(0.00)*
SDEBT*D	**+**		0.052	0.027
			(0.00)	*(0.00)*
Adj. R2 (%)		6.7	6.8	12.3
Sample		Whole		[-2;4[interval
No. firm-years		51,561		6,504

Variable definitions: SNI is reported net income scaled by total assets; SDEBT is the debt ratio (financial debt/total assets); SLNI is previous period net income scaled by total assets; SIZE is the natural logarithm of current total assets; AUDIT is a dummy variable that takes value 1 if the accounting report is audited, 0 otherwise; SDEBT*D is an interactive variable defined as the product of SDEBT and D, where the latter is a dummy variable that takes value 1 if the firm has net income in interval [0; 4[, zero otherwise; ΣYEAR is a set of dummy variables, taking value 1 if the firm-year corresponds to the year, 0 otherwise; i,t are firm and year (1999-2004) indexes, respectively.

Notes:

a) The model was regressed by OLS. Intercept coefficients and year effects are untabulated;

b) The p-values are two-tailed.

Exhibit 1. **Empirical distributions of net income**

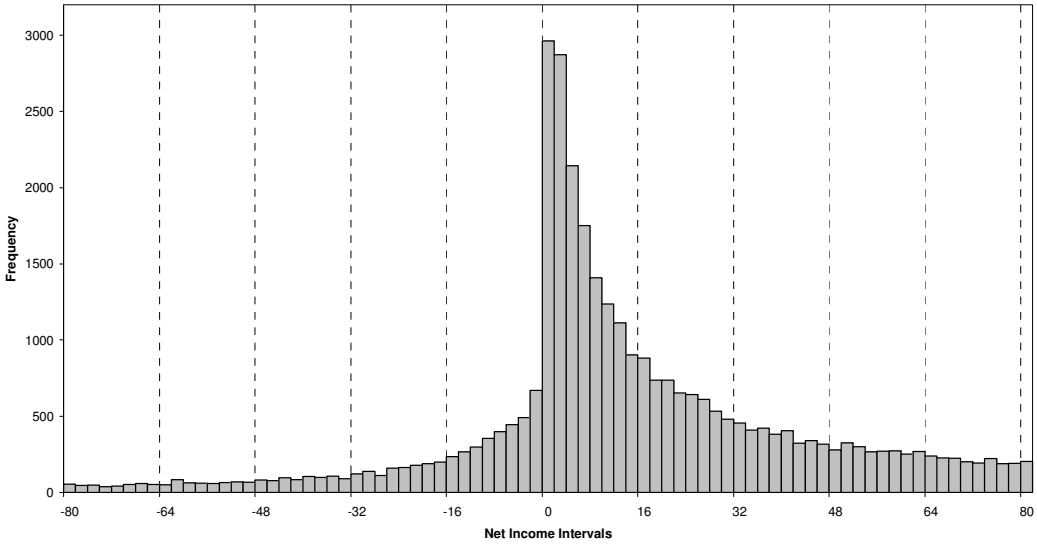

Fig. 1.1. Global distribution of net income. Interval width is two thousand Euros. The first interval at the right of zero is [0 ; 2[, and is defined in thousands of Euros. The vertical axis represents the number of observations in each interval. Period 1999-2004.

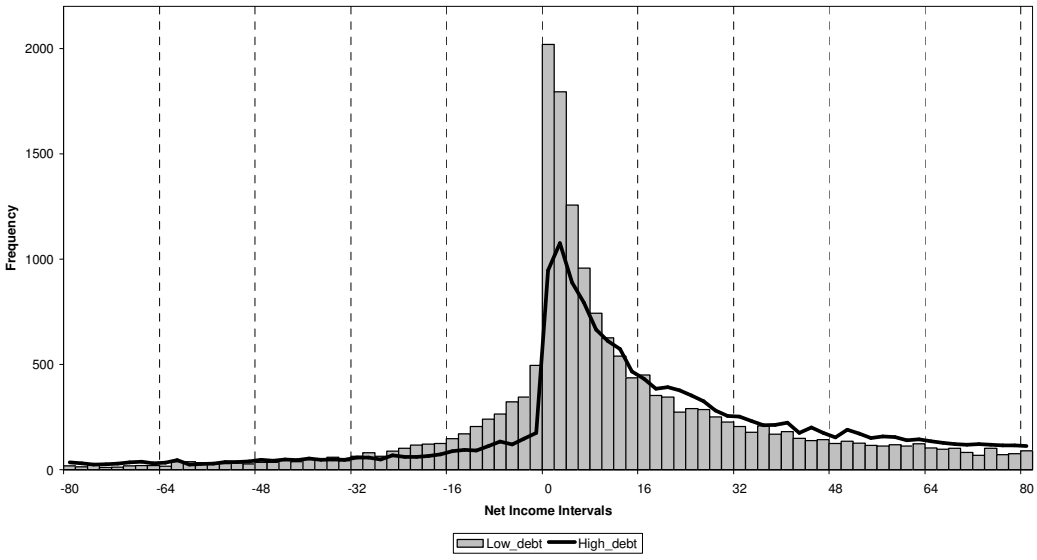

Fig. 1.2. Comparative Low (bars) and High (line) financing needs distributions of net income. Interval width is two thousand Euros. The first interval at the right of zero is [0 ; 2[, and is defined in thousands of Euros. The vertical axis represents the number of observations in each interval. Period 1999-2004.