

A NEW DETERMINANT OF DEBT MATURITY
STRUCTURE:
THE OWNERSHIP AND CONTROL STRUCTURE

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Abstract

This paper provides an empirical analysis of the determinants of Debt Maturity Structure. Besides the determinants investigated by previous literature (growth opportunity set, size, quality and asset maturity), this work attempts to examine a possible relation between Debt Maturity and Ownership Structure. We consider the concentration of ownership inside the major shareholding and the presence of a large external shareholder as a major stockholders to be relevant. Moreover, we attempt to investigate what possible influence could come from the different identity of investors. In this way, we investigate the impact of managerial ownership and the presence of institutional investors. In doing so, we use a sample of 200 UK no-financial companies from 1990 to 1999 in order to run a cross-sectional study in 1999 and one with average values. From traditional determinants point of view, we find support for the cost-contracting hypothesis, but not for the “signalling hypothesis”. From ownership side, we find consistency with “large shareholders hypothesis”, but not with “control hypothesis”. There is weak evidence supporting the “institutional investors hypothesis” and no support to the “managerial ownership hypothesis”.

Key words: debt maturity structure; ownership structure; cross-section average

JEL Classification: G3; G32

1. Introduction

There is a vast theoretical literature regarding the choices of optimal capital structure that takes into account, in particular, the influence of debt maturity policy on firm value. Debt Maturity Structure, defined as a measure of the proportion of long-term debt to total debt¹, is treated as an instrument to reduce the costs linked with debt financing. The main prediction is that short-term debt can be a more effective tool than long-term one to solve or, at least, to diminish these costs. Costs are analysed from different points of view. The main studies focus, on one side, on the area of Agency Costs (Jensen-Meckling, 1976; Myers, 1977; Titman-Wessel, 1988; Whited, 1992) related to underinvestment problems, growth opportunities, scales economies and, on the other side, on the area of Asymmetric Information (Flannery, 1986, 1994; Diamond, 1991; Titman, 1992) related to signalling problem and reputation in the market and, finally, on the area of corporate taxes (Brick-Ravid, 1985, 1991; Kane *et al.*, 1985).

Despite of a considerable amount of theoretical studies, there is few empirical works. To the best of our knowledge, only recently some authors empirically tested the theoretical predictions on the determinants of debt maturity structure. The main studies are by Barclay-Smith (1995) who find results on positive relations between little growth opportunities and long-term debt, between size and long-term debt and, on the other side, a negative relation between asymmetric information and long-term debt; another work by Stohs-Mauer (1996) reports inverse relations between earnings surprises and long-term debt and between firm's effective tax rate and long-term debt and a direct relation between asset maturity and debt maturity.

Moreover, little has been done on the field of debt maturity structure using non-US data. Our only one rigorous reference on UK non-financial companies work is by Ozkan (2000) that provides a positive relation between asset maturity and debt maturity, a positive relation between little growth opportunities and long-term debt and a limited support to an inverse relation between higher future earnings and debt maturity.

¹ Different proxies of Debt Maturity are presented in the following sections.

The present study is an attempt to develop these previous works and to make a thorough investigation on the determinants of debt maturity structure in a sample of non-financial UK listed companies between 1990 to 1999.

Moreover, besides the economic determinants mentioned above, we want to test a possible relation between Debt Maturity and Ownership Structure.

There is a huge theoretical and empirical literature focused on the effects of ownership and control structure and on firm performance and capital structure. The former works attempted to solve problematic aspects of empirical analysis related to the ownership structure. First of all, the concept of control and the classification of control type (Fama-Jensen, 1983; Monsen et al, 1968; McEachern, 1975; Zeckhauser-Pound, 1990; Leech-Leahy, 1991) are widely studied in a lot of empirical work particularly on US companies. Secondly, a big branch of literature focuses on the identification of shareholders and on the different kinds of incentives of particular kinds of investors, such as large shareholders, institutional investors, managers or families (Friend-Lang, 1988; Shleifer-Vishny *et al*, 1986, 1996). Last, but not least, a recent field of literature analyses different features of various kinds of ownership structure across many developed countries (La Porta *et al.*1996, 1998, 2000; Mayer, 1988, 1990, 1994; Rajan-Zingales, 1995²).

However, to the best of our knowledge, there is no relevant study on the relation between ownership structure and debt maturity structure.

The rationale below our attempt to relate these different structures is that inside a company there are a lot of interest conflicts (agency problems) between different stakeholders. The debt maturity structure refers particularly to the agency problems between shareholders and debtholders, while the ownership structure applies preferably to agency problems between shareholders and managers and between managers and the other stakeholders.

In this work we ask and inquire if it is possible that the ownership structure can influence Debt Maturity Policy and if it is related in some ways to the agency problems typical of debt maturity structure. In this way we could define the ownership structure as one of the determinants of debt maturity structure.

² Many other references will be recommended in the following parts of present work.

Because of the lack of previous studies in this specific field, we organize this work as follows: in the first part, we will outline and summarize, firstly, the typical problem stemming from interest conflicts between shareholders and debtholders (underinvestment problem) and the other problems that refer traditionally to the literature on Debt Maturity Structure (signalling problem and asset maturity).

Secondly, we will describe which kind of agency problems stem from the separation between ownership and control, which means, the issues derived from the conflicts between shareholders and managers (free cash-flow problem) and manager and other stakeholders (risk sharing), as suggested by the most known literature.

Finally, we will try to formulate some hypotheses linking the main implications of ownership structure with the problem related to debt maturity structure.

In the second part of the work, we empirically test these hypotheses by regressing the most important variables of firm-specific characteristics and ownership aspects on the debt maturity dependent variable. We will run two different kinds of cross-sectional studies. The first one is a cross-section in 1999 and the second one is a cross-section “average” in 1999.

The results expected in this study are that the debt maturity is inversely related to growth opportunities and directly related to firm size. Moreover, the matching of assets and debts is expected to be respected and the high-quality firms are predicted to have shorter debt maturity. From the innovative part on ownership structure, we consider high concentration more likely to determine a higher debt level, while it is an empirical issue to foresee the sign of the relation between large external shareholder’s presence and institutional investors and debt maturity.

The rest of this work is organized as follows: in sections 2 and 3 we present and discuss the main points of literature regarding respectively debt maturity structure and ownership structure; section 4 is dedicated to the explanation of databases and variables; section 5 refers to the results of regressions; finally, section 6 summarizes the main conclusions.

2. Theory on Debt Maturity Structure

2.1 Underinvestment problem

In order to explain the underinvestment problem stemmed from agency costs between shareholders and debtholders, we refer to the seminal work of Myers (1977) on the determinants of corporate borrowing. Myers's approach is to use the Option Pricing Theory (OPT) to illustrate the investment decisions and the implications for capital structure.

As he suggests, we can consider corporation's future investment opportunities as options in a world without taxes and bankruptcy costs, with perfect and complete capital markets and with managers acting in shareholders' interests. In particular, the firm value depends on the value of its assets as a whole. There is a distinction between assets regarded as call option, that is, whose ultimate value depends on further discretionary investments by firm and assets whose ultimate value doesn't depend on further investments. The former kind of assets is related to "asset in place" concept, while the last one is related to growth opportunities. Actually, the ultimate value of almost all assets depends on discretionary investments. Set of investments in that sense is really wide: from maintenance of plant and equipment to R&D projects.

At option's expiration date the firm has to decide to exercise the option or not, that is, to pursue or not future investment opportunities. This decision depends on the capital structure features and, in particular, on the size of payments due to the creditors by the firm. It is shown that when the firm has outstanding risky debt, the decision to invest doesn't follow the maximization profit rule.

Under all-equity financing, the firm must decide to exercise or not its option, or, in other words, to invest or not at expiration date. The value of option is equal to the present value of growth opportunity (or, of its further discretionary investment), $V(s)$, where s represents the states of the world. If it decides to invest, additional equity must be issued in the amount of I , the exercise price or cost of project. It decides to invest only if the value of option is greater than its cost, $V(s) > I$. In Appendix A, Graph. 1 shows the condition to invest ($x(s)=I$) or not ($x(s)=0$). At point s_a (the breakeven point), $V(s)$ is equal to I and for all states $s > s_a$ the firm decides to invest. Its value is:

$$(1) \quad V = \int_{s_a}^{\infty} q(s)[V(s) - I] ds$$

where $q(s)$ is the current equilibrium price of a dollar delivered at period $t=1$ if and only if state s occurs.

Considering borrowing, firm can issue risky debt with the promised payment P . In particular, when the debt matures after the investment option expires (the outstanding risky debt), shareholders can exercise the option to invest only if the value of the option is greater than the cost of investment and the interest payment, $V(s) > I + P$. If $V(s) < I + P$ and the investment is made, then I is greater than market value of firm, as it is shown in Graph. 2. The new breakeven point is s_b depending on magnitude of payment P . As long as $s_b > s_a$, there will be a loss of value in some states of nature, represented in the figure by shaded triangle. The size of P determines the size of loss. The firm value is less than value of all-equity financed firm whenever P is positive. It is equal to:

$$(2) \quad V = \int_{s_b}^{\infty} q(s)[V(s) - I] ds$$

If P is large enough such that present value of project is less than costs of investment and payment of debt in all states, then firm will be induced to not exercise the option and $x(s)$ will tend to be zero. In this way, firm will be worthless, because it will pass over its growth options. The relation between firm value and payment is, also, monotonically decreasing, as shown in Graph. 3.

Because the shareholders' objective function is to maximize the firm value, the main implication of this theory is promised payment related to debt will lead to abandon some projects even with positive NPV in some states. This is the so-called *underinvestment problem*.

Another consequences could be an adverse incentives to shareholders to choose riskier projects and, in this way, expropriate and transfer wealth from debtholders to themselves (*risk shifting problem*, Barnea *et al*, 1980).

The extreme consequence refers to the choice to issue debt or not. From the above explanation it derives that by preventing an optimal investment policy risky debt

in balance sheet decreases the value of the firm. Because of the shareholders' maximization target, the optimal policy to get that would be no debt issues at all. In this way, it can be shown that credit rationing occurs even in perfect capital markets. As in Graph. 3, the function that relates value of debt and payment has a definitive limit representing the maximum debt borrowed by a firm, if it wishes. Even if the firm is willing to pay higher interest rates, the value of debt decreases.

The extreme result is, also, firm with valuable growth opportunities would never issue risky debt³.

The incentive problem to invest could be controlled in several ways: by including less debt in firm's capital structure, by including restrictive covenants in firm's indenture agreement or by shortening the effective maturity of debt. The last one is particularly interesting for our aim. Myers argues that if the outstanding debt matures before the investment decision option expires (the opposite case as above), there is no incentive for suboptimal investment choice.

The direct implication of this theory regards the investment opportunity set: firms with more growth opportunities are more likely to have a greater underinvestment problem. As a consequence, they will issue more short-term debt. This is defined "the cost-contracting hypothesis" (Barclay-Smith, 1995).

Obviously, short-term issues have higher costs than long-term. These costs are, for example, higher out-of-pocket flotation costs, the opportunity costs of management devoting time in dealing with more frequent debt issues and, finally, higher reinvestment risk and potentially greater illiquidity problem. In spite of all that, some studies (Stulz-Johnson, 1985; Ho-Singer, 1982) underline the advantages of financing investment with short-term debt. They stress the aspect of high-priority claims (short-term debt is associated with these sort of claims) that, in one part, can limit wealth transfers from shareholders to existing debtholders and reduce the incentives for shareholders to forgo this investment and, in other part, have a higher effective priority outside bankruptcy, because they are paid first.

³ However, the choice to finance investment with debt or not is not so easy. It is necessary to take into account the costs of equity issue: there are incentive problems with equity as well as debt (Jensen-Meckling, 1976). To quote Myers : "[..]Debt may be is the lesser devil [..].

2.2 Size

Another implication regards the size of the firm. Smaller firms are likely to have in the investment opportunity set relatively more growth options. A smaller firm has more margins to growth relatively to its sector and its budget constraints: its assets are more likely to be almost assets whose ultimate value depends on further discretionary investments. These kind of firms must face more expiration dates to exercise growth options and to decide to invest or not. In this way, these firms bear more agency costs, more interest conflicts between shareholders and debtholders. For instance, Smith and Warner (1979) argue that these conflicts of interest could generate risk shifting or claim dilution phenomena. The consequences are that smaller firms are more likely to issue shorter-term debt to alleviate these costs than larger, well-established companies.

Moreover, as suggested by a number of authors, larger firms have more possibilities than smaller to access to every capital market (Titman-Wessel 1988) and to guarantee with substantial collaterals even long-term debts. Smaller firms are precluded from accessing long-term debt markets, because they can offer a really small portion of their future investment opportunities as collateralizable assets (Whited, 1992). The implication of this argument is the same as before: smaller companies are likely to issue more short-term debt.

However, it's necessary to keep in mind the aspect of scale economies. Public issue costs have large fixed component resulting in huge scale economies. A small firm cannot afford to sustain these costs for frequent issues, but, as we have just argued, it needs short-term debt in order to curtail the conflicts of interests between shareholders and debtholders. So, the best solution is to issue a short-term private debt instead of public debt⁴.

⁴ In particular, it will prefer the bank debt as private debt. The relationship between bank and firm have special characteristics. It is a personal long-term relation. From bank point of view, the repetition of debt bargaining in a long-term horizon ensures a constant monitoring of the client. On the other side, from firm point of view, the continuous renegotiation of debt conditions in a long-standing relation cuts down the short-term debts costs. There is a huge literature on advantages and disadvantages of firm-bank relationship from different points of view (agency costs, asymmetric information and asset specificity). In particular, in order to enrich briefly the above arguments, we want to mention here the study of Sharpe (1990), pretty related to the long-term horizon aspect of bank relation. He argues that this kind of dealing is endogenously a long-term clientele relationship, because of the evolution of asymmetric information between firm and credit institute. In the long-run the company that relates with a bank ends up being *informationally captured* by bank. This drawback is particularly stronger for small enterprises that cannot afford to diversify their liabilities portfolio by issuing different loans or by relating to different credit institutes.

However, the aim of this work is to analyze the determinants of debt maturity and not the choice between public and private debt.

Nonetheless, we can finally assert that debt maturity varies directly with firm size.

2.3 Asset Maturity

Finally, the last hypothesis regarding the agency costs that we will test in this work is the so-called matching principle. The model of Myers (1977) presented in previous section provides us with a rationale for firms to match the effective maturity of their assets and liabilities. At the end of an asset's life the firm must face the problem of a new investment. If at this moment debt has not matured yet, it may be created the adverse incentive to not invest or to invest suboptimality. Issuing debt at this date can alleviate the agency problems between shareholders and bondholders. Moreover, from the Myers's classification between assets whose ultimate value depends on further discretionary investments and assets whose ultimate value doesn't depend on further investments, it is possible to argue that matching maturities of assets and liabilities is relevant not only for tangible assets, but even for intangible assets.

Besides the motivation derived from agency costs theory, matching assets and liabilities maturity is a common prescription in business literature and usually is called "industrial paradigm" referring to the illiquidity risk. In fact, if debt maturity is shorter than asset life, the firm could have no cash to reimburse the due payment. Even in the opposite case, when debt maturity is longer than asset maturity, the cash flow earned from the assets could be already spent at the moment of due debt payment. Maturity matching can reduce both this kind of risk and the expected costs of financial distress (Stohs-Mauer, 1996).

So, the empirical hypothesis is that debt maturity is directly related to asset maturity.

2.4 Signalling Problem

The second problem we detected is the signalling problem when there is no same information about quality or value of a firm between insiders and outsiders.

The literature of 80s is plentiful of works on signalling. In particular, we refer here to a model (*Flannery, 1986*) that relates the debt maturity structure to the willingness of good firms to signal their type and to the success of doing so.

The main idea is that under uncertainty the firm's choice of risky debt maturity sometimes can signal its credit quality.

Debt market investors know at time $t=0$ that there are two types of firms: good and bad firms that differ each other in their "up" probability, that is, probability of success of their projects ($p = p_g > p_b$). Moreover, investors know the distribution (J) of good and bad firms in the market.

Under full information, investors can costlessly identify the quality of every firm and, consequently, they can compute a proper coupon rates (default premia) on bonds that they purchase from firms both in short-term and long-term debt. Every borrower chooses to issue short-term or long-term debt on the basis of advantages and disadvantages of both different debts. Issuing short term debt today implies a reissue debt in the future at a price depending on the uncertain future conditions of the firm. On the other side, issuing long-term debt alleviates this kind of uncertainty, but there is a higher risk of credit quality deterioration. Anyway, each borrower pays at the maturity date (for short-term, at $t=1$, while for long-term, at $t=2$) the price corresponding to its own type. So, referring to the Graph. 4 in Appendix A, we can write the interest rates of long-term and short-term in equilibrium as:

$$(3) \quad DR_2 = \frac{D - M_5(1-p)^2}{2p - p^2}$$

$$(4) \quad DR_1 = \frac{D - M_5(1-p)}{p}$$

where R_i represents interest factor, M_5 the state of bankruptcy ($D > M_5$) .

Conversely, with asymmetric information, investors cannot distinguish good firms from bad firms and, consequently, a pooling equilibrium occurs. The interest rates change as follow for long-term and short-term debt respectively:

$$(5) \quad DR_2 = \frac{D - M_5 E(1-p)^2}{2E(p) - E(p^2)}$$

$$(6) \quad DR_1 = \frac{(1 - E(p))D - M_5 E(1-p)^2}{E(p) - E(p^2)}$$

and lie between values of interest rates of same maturity debt. Lenders cannot identify the quality and, so, they value every firm as the average firm in state at time $t=1$. The consequence is a misvaluation in both short-term and long-term debt: the firm of good quality is undervalued and bears costs of value's transfer from themselves to the firms of bad quality. The risk-neutral insider's valuation of alternatives strategies to finance investment projects is determined by manager's (shareholder's) estimation of the project's "up" probability p and by terms on which different maturity debts can be sold in the market. The last one condition depends on valuation from market's investors as we have just described. The value of equity with long-term and short-term debt issues can be synthesized as follows:

$$(7) \quad V_L = V^i + V_L^{mis}$$

$$(8) \quad V_S = V^i + V_S^{mis}$$

where V^i is the firm's "intrinsic" value and V_L^{mis} is the firm's "misinformation" value from the pooling equilibrium in long-term debt and V_S^{mis} the firm's "misinformation" value with short-term debt.

It is shown that there is a market value loss in both cases for good firms. However, between long-term and short-term default premia, good ones perceive the former more unreasonable, because the market imputes a higher probability of credit quality deterioration than the insiders do. As a consequence, they have the incentive to issue short-term debt. Conversely, bad firms' aim is to sell overvalued long-term debt. Rational investors know these incentives and try to capture some insiders' information from debt maturity structure of firms.

The Flannery model's aim, however, is to analyse the market's conditions under which the debt maturity structure can rightly be considered as good signal of firm quality.

It's interesting to see that in debt market without transaction costs (when the debt issue is costless) the only one possible equilibrium is pooling equilibrium. In particular, the debt market has a pooling equilibrium in short-term debt, because good firms will sell short term debt to try to signal their quality. When market acts rationally (that is, investors assume that good firms issue short-term, while bad firms issue long-term debt), bad firms can mimic the issuing behaviour of good ones and try, in this way, to capture any positive misinformation value. The result is every firm will issue short-term and anyone will issue long-term debt. So, there is no costly signal available to good firms.

Conversely, if debt issuing has positive costs, then it may occur sometimes that bad firms are self-selected to issue long-term debt and good firms can use their debt maturity policy to signal rightly their own quality to the market and separate themselves from bad firms. Flannery shows that the existence of signalling equilibrium depends on the distribution of good and bad firms (J) and on the consistency of underwriting costs for debt. The first condition refers to the fact that when good firms are the minority a representative good firm loses more from a misevaluation in pooling equilibrium, because all misinformation costs in a rational debt market must sum to zero and, consequently, the undervaluation costs are divided between less agents! With more losses, therefore, good firms can always increase the level of debt transaction costs up to a point where bad firms have no advantages to swap to short-term debt. This is related to the second condition, the magnitude of issuing costs. There could be a separating equilibrium if the bad firms' misinformation value is low enough for the short strategy relative to issuing costs and misinformation value of long-term strategy.

Another asymmetric information model (Titman, 1992) predict the possibility of a pooling equilibrium in a opposite way to the Flannery's prediction. Titman refers to interest rate uncertainty and financial distress costs as a good reason for high-quality firms to swap short-term for long-term debt.

As a result, the relation between quality and debt maturity structure is not so straightforward and not so easy to test, because quality is a private information. However, in our estimates we refer to the Flannery's separating equilibrium (signalling equilibrium) and, also, we suggest a negative relation between firm's quality and debt maturity.

3. Theory on Ownership and Control Structure

The agency problems arise from the separation between ownership and control inside a company⁵. If we consider a typical public company, characterized by a numerous group dispersed of shareholders, any single owner has no incentive to monitor the actions of management because of the free rider problem (the benefits from monitoring are shared between all shareholders, but only one bears the monitoring costs). So, every shareholder hopes that someone else will take the actions to control and better off the performance of the company such that he/she can free-ride on the efforts. As a result, the effective control rights are of managers. The example of a public company is quite extreme⁶, but it is useful to highlight the interest conflicts that can arise when the location of control doesn't coincide to the location of ownership. That means, the shareholders are separated from managers and managers have no percentage of ownership in the company. The other case occurs when the manager is even owner. We want to analyse in this contest the two major agency problems that can happen: free cash flow problem and risk shifting. Moreover, we try to give some suggestions about the influence of these problem on debt maturity policy.

⁵ The case of identity of control and ownership (Grossman-Hart-Moore, 1980) is prevailing theoretical and it is not suited for this kind of analysis. Moreover, we don't consider it a good example of the real cases, even in particular economic systems, as Italy, where the ownership structure is almost concentrated (it is typical actually a family structure).

⁶ Moreover, we cannot consider it so much representative of the real world. In fact, the first studies on ownership structure around the world (Berle-Means, 1932) affirmed the prevalence of the widely-held corporations in the United States. Their book stimulated for long time a huge literature on managerial discretion and on the power of management inside the company and against the shareholders (Williamson, 1964; Jensen-Meckling, 1976; Grossman-Hart, 1980). An image of the modern corporations as prevailing public company lasted until the end of 70s. In recent years a lot of studies questioned this image and showed the concentration in ownership structure is diffused everywhere, even if in different percentage (Shleifer-Vishny, 1986, 1997; Franks-Mayer, 1994,1995; Berglof, 1990, 1997; Barca, 1994, 1995; Prowse, 1992 are only a few sample of the corporate finance branch in the recent literature).

We stress here to keep in mind that there are no references in the previous literature on the relation between ownership structure and debt maturity. Our attempt is to deduct some reasonable arguments on this topic from the existent huge literature on ownership structure and capital structure and from the conclusions of the previous section on debt maturity.

3.1 Free cash flow problem

When manager has the effective control rights inside the company, he/she has the unmonitored power to decide about the firm's resources. Ample free cash flow (or unnecessary financial slack) can induce managers to carry on not maximizing value projects (Jensen, 1986). Usually, managers expropriate funds from company in order to maximize their own utility function (Jensen-Meckling, 1976).

The expropriation of funds can take different elaborate forms: the easiest, managers may be involved in spending more in luxury rather than what would be valuable for the owners (the so-called no-pecuniary benefits or *perks*). Another form is to invest in projects because they give benefit only to managers. For instance, the phenomenon of *empire building*: other things equal, managers prefer to run large businesses instead of small even if getting from small to large may not be a positive-NPV undertaking and even if the growth of the firm is beyond the optimal size.

Less evident example of expropriation is the *transfer pricing*: managers set up a big company that they own completely and, then, they sell the output or, worse, the assets of the company that they run to their own company at a smaller price.

Another one is the phenomenon of *entrenching investment*: manager prefer to choose the project where he/she is still competent, refusing one that requires a manager with special skills. The result is the staying on the job of managers that are no longer competent or qualified to run the firm.

In principle, the solution of this problem is reducing free cash flow available to managers and inducing them to behave efficiently.

One solution debated in literature is an appropriate Dividend Policy (Easterbrook, 1984) that forces managers to pay shareholders with internal resources. However, this

is not a strong commitment for managers that can announce a permanent increase in the dividends, but dividends can be reduced in the future.

Debt, as Jensen (1986) argued, can be a good substitute for dividends, because managers bond their promises to pay out future cash flow in a really durable way. In fact, increasing debt level means giving to the recipient shareholder the right to take the firm into bankruptcy court if manager doesn't meet the regular commitment to pay the due interests and principal amount. In this way, the debt level reduces the agency costs of free cash flow reducing the cash flow available to the managerial discretion. This effect is called "control hypothesis" for debt creation⁷.

However, control does not necessarily exert a positive effect. This is applicable to the firms with growth opportunities that have highly profitable investment project, but not so much free cash flow. That is because these corporations need to go regularly to the financial market in order to obtain capital. In this case, investment banks, institutional investors and analysts play the role of monitor of these companies and, consequently, shareholders don't need to limit the managerial discretion by debt issue.

Vice versa, the monitoring role of debt is more effective in companies that generate large amount of cash flow, but they don't have high growth possibilities, and in organizations that must shrink.

As a consequence, we can point out a positive relation between the dispersion of ownership (and, also, the increasing agency costs between shareholders and managers) and the level of debt.

Moreover, as far as debt maturity policy is concerned, we predict a positive relation between concentration and debt maturity. In fact, from ownership literature we derive that more concentrated ownership diminishes the agency costs between managers and shareholder (and consequently, the free cash flow problem) and the debt need not be a tool in order to better off the conflicts. On the other side, from debt maturity we take the assumption that short-term debt is more useful to solve agency problems. As a

⁷ This is one of the benefits of debt against the widely discussed agency costs in a comparison with equity issue. We have to remember that the previous literature on ownership and capital structure explores the agency costs of different financial sources and compares advantages and disadvantages of each found in order to find a reasonable solution to the interest conflicts between different stakeholders. Consequently, the arguments are often in favour of debt against equity issue and *vice versa*. The present work deviates in part from this field, because we want to explore some possible relation between ownership structure and debt maturity. Above, we try to formulate some hypotheses about this relation.

result, an increasing concentration could determine a preference for long-term debt instead of the short-term.

Besides the “control hypothesis” for debt creation, there are many other arguments (sometimes in conflict with each other) that investigate the effects of different aspects of ownership and control structures on financial structure.

In the following we want here to briefly summarize the main results that we believe relevant for this work.

The first aspect investigated by many authors is the presence of *large external shareholder*. Large shareholding has an active role in corporate governance: they can solve free rider problem and put management under pressure or expel it through proxy fight or takeover⁸.

From capital structure point of view, by Friend-Lang (1988), the presence of large stockholders can induce a higher debt level than what manager would prefer and, in this way, they combine the interests of managers and public investors. That is, the presence of large external stockholders reassure or signal to the market that managers are monitored by investors whose interests are more closely coincide with those of typical dispersed shareholders. In this way, managers can not adjust the debt level to their own interests. As a consequence, it is predicted a positive relation between large shareholders and debt level⁹. This result is opposite to the conclusion of Jensen’s “control hypothesis”, because the point of view is different. With “control hypothesis” we refer to the agency costs between managers and shareholders, while with the “large shareholder hypothesis” we refer to the need to communicate or signal to the market that these agency problems are almost solved.

In respect to the debt maturity, we could refer to the signal hypothesis mentioned in the previous section (debt maturity structure used as a signal of firm quality) and we suggest a negative relation between concentration and debt maturity.

⁸There is a large amount of literature and empirical evidence showing the active role of large shareholders inside the companies, the tools used by them and the effects on the performance of their actions (Franks-Mayer, 1994; Goodhart, 1994; Gorton-Schmidt, 1996; Edwards-Fischer, 1994; Aoki, 1994, 1998; Hoshi et al., 1990, 1991; Yafeh-Yosha, 1996).

⁹ Friend-Lang (1988) compare different forms of ownership structure. They calculate a cut-off point in the shares percentage to divide the dispersed companies from those more concentrated and the managerial owned companies from those non managerial. Regarding the first classification, they find in the dispersed ones a debt level lower than in the others. We will return later to the second classification, when we introduce the aspect of managerial ownership.

An alternative conclusion to Friend-Lang (1988) is proposed by Zeckhauser-Pound (1990). For them, just the presence of large shareholding could play the role of signalling to the market that managers are less able to take profit reducing investment actions or cash flow and this fact may mitigate the need for managers to issue debt as a signal. If the presence of large shareholders is an effective signal, the firm could avoid to do more debt commitment.

The expectation is a lower debt level in the companies with large shareholders. This conclusion is aligned with the prediction of Jensen “control hypothesis”.

The last one consideration regards the identification of large shareholders and, in particular, if they are *institutional investors*. There are two different kinds of hypothesis: the first one is the efficient monitoring hypothesis, which predicts that institutional investors are more informed and able to monitor management than small shareholders. The alternative is the conflict of interest and the strategic alignment hypothesis that suggests a collaborative behaviour with managers against the other shareholders. Brickley *et al.* (1988) found that institutional investor less influenced by management, such as mutual funds and public pension funds, are more likely to be against management than the other, such as investment banks and insurance companies, that may have current interests or potential business with the firm.

From capital structure point of view, it can be predicted in the first case a positive relation between institutional investors’ ownership and debt level, while in the second case a lower debt level could be expected.

This is more true if we consider that institutional investors such as banks or insurance companies can control the management with the voting rights. In that sense, the cases of Germany and Japan, for instance, are really representative of this situation¹⁰. From debt maturity point of view, we argue that there could be a negative relation between institutional investors (such as pension funds) and debt maturity and *vice versa*.

There is an alternative view of the incentives of institutional investors. In general, this kind of investors are not interested in the firm’s business, but “cherry

¹⁰ See Edwards-Fischer, 1994; Aoki ,1994, 1998; Hoshi *et al.*, 1990, 1991; Yafeh-Yosha, 1996; Masasuke, 1998.

picking” in the market¹¹. They seem to prefer liquidity against control (Coffee, 1991) and they are not involved in the company’s life.

As a consequence, their influence on management is not strong and the level of “monitoring debt” (short-term) is not increasing. For what concerns the other type of investors, investment banks and insurances, they are more involved in the company, but they can exercise a stronger control by voting rights instead of higher short-term debt level. The result is a positive relation between debt maturity and the presence of investors as shareholders.

3.2 Risk shifting

The agency costs arising from the risk aversion of management concern all the stakeholding group: managers, shareholders and debt holders.

Managers are “naturally” risk averse, because they care about the maximization of their own utility function relatively to the maximization of company’s value. If the firm does poorly or, worse, goes bankrupt, managers will lose their job and, likely, their reputation in the labour market. This attitude encourages risk aversion actions. That means, managers may choose projects that are safe but have lower expected return than riskier ventures. Moreover, they tend to finance investments with internal funds or safe debt instead of risky debt or equity issue (following the classical Myers’s “pecking order theory”, 1984).

Shareholders have the opposite preference. Risky projects are more valuable for them at the expense of debtholders, because they don’t have to pay anything from the gains to debtholders, while debtholders bear the entire cost of failure. As a consequence, debtholders draw up particular debt contracts (for instance, bond indentures and other similar instruments) and demand properly adjusted rate of interest in order to discourage the incentives of shareholders. The question for debtholders then becomes: how to reduce monitoring costs? The answer is: make the firm retain internal fund as much as possible. In this way, given the existence of debt, manager can control the amount of risk of a certain project. If manager first issue debt and then finance new projects out of

¹¹ This is more true if we think about the market crisis in the US at the end of 80s due to the strong presence of huge amount of institutional investors (pension funds, in particular). Their ownership had a completely negative impact on firms’ performance, demolishing the American myth of a market-oriented country.

internal funds, the debt level falls (and consequently the leverage ratio). The lower it falls, the lower the manager's risk and the greater the wealth transfer from shareholders to debtholders who receive the contracted-for interest but escape the contracted-for risk.

As a consequence, from capital structure point of view we can assist to a decrease of debt level.

A strong implication of this hypothesis concerns the aspect of managerial ownership. With increasing insider ownership, risk aversion of the owner-manager is magnified, because he/she hasn't a diversified portfolio and if the firm goes bankrupt, he/she will lose job and wealth. Consequently, his/her incentive is to lessen the level of debt, in particular, risky debt, of the amount lower than what preferred by external shareholders with well diversified portfolios (*Friend-Lang, 1988*).

As before, we want to add to this hypothesis an alternative explanation. Kim-Sorenson (1986) argue that increasing inside ownership determines higher debt. They give three possible reasons to justify that: firstly, high inside ownership faces bigger agency costs with equity issue. So, it issues debt to avoid these agency costs. Secondly, high inside ownership issues debt, because the agency costs related with debt decrease with more debt. Finally, high inside ownership could issue a quantity of debt above an optimal level to maintain the control of the firm.

From debt maturity point of view, taken into accounts all the previous hypotheses, we suggest that the relation between debt maturity and the insider ownership may be positive: a riskier owner manager will prefer to not run the illiquidity risk when he/she was not able to meet the payment. The out-of-pocket flotation costs of short-term debt would be for him/her higher than for well diversified shareholder.

Before to continue with the description of data, we concisely sum up the main hypotheses that are going to test in the following sections:

- 1) “cost-contracting hypothesis”, firms with more growth opportunity are likely to issue more short- term debt;
- 2) “size hypothesis”, smaller firms are likely to issue more short-term debt;
- 3) “industrial paradigm”, firms try to match the maturity of debt with maturity of assets;
- 4) “signalling hypothesis”, high-quality firm want to issue short-term debt and low-quality firm prefers long-term debt;
- 5) “control hypothesis”, more concentration and, consequently, more pressure and control on manager implies higher long-term debt level;
- 6) “large shareholders hypothesis”, the presence of large shareholders as a signal of effective monitoring action can avoid the firm to do more debt commitment;
- 7) “institutional investors hypothesis”, the presence of this kind of investors seems not to need the debt as instrument of monitoring;
- 8) “managerial ownership hypothesis”, the managerial risk aversion is likely to determine not high debt level.

4. Data

4.1 Databases

For our empirical investigation on the determinants of debt maturity structure we use a sample of listed English non financial companies from 1990 to 1999. For the specificity of our work, we need two different databases: one for the relevant firm-specific characteristics and the other one for the ownership coefficients.

A) Economic Database

We constructed our database with data available on DATASTREAM database. DATASTREAM provides both accounting data for firm (Balance Sheet and Profit&Loss accounts) and the market value for equity for all considered years.

B) Ownership Database

We have been able to collect data on ownership structure thanks to the site of HEMSCOTT. It provides general information, including the ownership state, for every listed company in the London Stock Exchange for the year 1999. In particular for our work, we collected data on the directors' list, on the Board of Directors and, finally, on the major shareholders list. We could take advantage of the classification between executive and no-executive directors of the Board in order to recognize the managerial (insider) ownership¹². In regard to the major shareholders list, HEMSCOTT provides information on the share percentage above 3% for external shareholders and above 1% for managers.

From the original sample (of 1309) we dropped the firms with missing data and, because of the feature of HEMSCOTT Database, we didn't consider the firms dead¹³ before 1999. Our sample turned out to be of 200 companies.

¹² In the following section we give an explanation of insider ownership that we proxy with dummies MAN and JMAN.

¹³ The usual definitions found in DATASTREAM are "dead" and "delisted".

4.2 *Dependent variable*

4.2.1 *Debt Maturity Structure Measure*

DATASTREAM reports the long-term debt repayable in 1-2 years, in 2-5 years and, finally, the long term loans repayable in more than 5 years. Unfortunately these kind of items are not available for every year of our sample. So, we decided to refer to other two items that assemble the previous objects: short-term loans, i.e. all loans¹⁴ which are due for repayment within 5 years and long-term loans that represent loans¹⁵ repayable in more than five years.

We could test our hypotheses with two different measures of debt maturity (Ozkan, 2000): one measure of long-term debt (debt maturity between 1 and 5 years) and the other one of “very long-term debt” (debt maturity more than 5 years).

However, at this stage of research and because of the new target to analyse the impact of ownership variables, we preferred simplifying the definition of the dependent variable and taking into account only the total loan capital repayable after 1-year¹⁶. As a result, our dependent variable MAT is represented by total loan capital to total debt¹⁷.

In the following sections, the dependent variable MAT used in the present work will be compared with the different measures of debt maturity drawn on previous studies. For instance, in Barclay-Smith (1995) MAT is the long-term debt represented by debt with a maturity of more than three years (arbitrarily chosen) to total debt; in Stohs-Mauer (1996) the dependent variable is the book value-weighted average of the maturities of the firm’s debt; in Ozkan (2000) there is only one regression where MAT is the ratio of debt that matures in more than 1-year to total debt.

The disadvantage of using our measure is that the item “total loan capital” contains sinking-fund provisions as well. Consequently, our measure overstates the effective maturity. This measurement-error problem can introduce a bias in our estimates, in particular, when the provisions are correlated to one of the independent variables. This is the case of growth opportunities variables. Firm with higher growth options try to put higher provisions in its debt contract. In this way, even if we expected

¹⁴ There is the exception of loans convertible, leasing finance and hire purchase.

¹⁵ Convertibles, leasing finance and hire purchase are included.

¹⁶ It includes, debentures, bonds, convertibles, and 'debt like' hybrid financial instruments.

¹⁷ It is equal to the total of all long and short term borrowings, including any subordinate debt and 'debt like' hybrid finance instruments.

for this firm a shorter-term debt (by the cost-contracting hypothesis), we could find a large overstatement. So, we have to keep in mind the bias possibility when we interpret the results.

4.3 Economic variables

For the definition of economic variables we refer to previous studies as Barclay-Smith (1995), Stohs-Mauer (1996) and Ozkan (2000) in order to be able to compare.

4.3.1 Growth opportunities

In all previous works this variable is proxied by the ratio of market value of total assets¹⁸ to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. From Smith-Watts (1992) on the influence of investment opportunity set on corporate financing, dividend and compensation policies, when a firm has higher growth opportunities, the ratio MTBV is larger.

As a consequence, in our regressions we expect an inverse relation between MAT and MTBV.

4.3.2 Size

We measure SIZE as a natural logarithm of total sales¹⁹ in constant 1992 prices (as in Ozkan, 2000). We liked better the natural logarithm of total sales instead of the natural logarithm of market value of the firm scaled by constant prices ($\ln MV$)²⁰, used by Stohs-Mauer (1996) and Barclay-Smith (1995), in order to avoid correlation problems between regressors. We predict a positive correlation between MAT and SIZE.

¹⁸ Total Assets is defined as the sum of tangible fixed assets, intangible assets, investments (including associates), other assets, total stocks, total debtors & equivalents and cash & cash equivalents (DATASTREAM' definitions).

¹⁹ By DATASTREAM definitions, total sales is the amount of sales of goods and services to third parties relating to the normal industrial activities of the company. It is net of sales related taxes and excludes any royalty income, rental income and other operating income.

²⁰ It is calculated by the book value of assets minus the difference between the market and book values of equity.

4.3.3 Firm Quality

The signalling literature doesn't give precise indications on how to build a valid proxy for quality. From the accounting and finance literature (for instance, Kleidon, 1986), we know that earnings follow a random walk. Referring to other studies, we try to proxy insiders' anticipated change in future quality as the future changes in earnings. We assume, also, that high-quality firms could have positive increasing future earnings; the opposite being true for low-quality firms.

QUAL, also, is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . According to the signalling hypothesis, we predict a negative relation between MAT and QUAL.

4.3.4 Asset Maturity

We proxy ASSMAT with the maturity of fixed assets. We measure the maturity of fixed assets as the ratio of total net fixed assets²¹ to total depreciation. The rationale of this measure is that depreciation used in company's balance sheets is a better approximation of economic depreciation than do the plans used by firms for tax purposes.

By industrial paradigm, we expect a positive relation between MAT and ASSMAT.

Finally, we add industry dummies to the traditional economic variables related to debt maturity hypotheses. We want to consider the relative influence of industry-specific²² effects on debt maturity policy.

For instance, we can suppose that sectors with higher growth opportunities, such as Software & computer services or Media & photography, require a larger amount of short-term debt, on the basis of the agency costs hypothesis.

²¹ Total net fixed assets is equal to the net total (after deducting accumulated depreciation) of land and buildings, plant and machinery, construction in progress and other fixed assets. Assets leased out are excluded (by DATASTREAM definitions).

²² The analysed sectors are 13 in total. See Appendix B for the sectors list by HEMSCOTT database.

4.4 Ownership variables

The definition of ownership variables is harder, because we don't have any work to refer to. So, we take the studies on managerial discretion and capital structure (Friend-Lang, 1988) and on concentration and corporate performance (Zeckhauser-Pound, 1990)²³ as starting points.

4.4.1 Concentration

In any study concerning the effects of ownership structure on performance, capital structure or some other aspects of companies the concept and definition of "control" is central. Taking Fama-Jensen' definition (1983) as a starting point, we can simply define "control" as the ability of a particular individual or group to effectively determine the affairs of the firm. Most of previous empirical studies focus on differentiating owner-controlled from managerial-controlled companies in order to apply the hypotheses of the managerial discretion literature²⁴.

The main feature of all these works is that every author assumes a particular cut-off point of percentage representing the type of control: the theoretical categories of "control type" are frequently based on a simple dichotomy into "owner-controlled" and "management-controlled". There are two main critics to this criteria: the first one is the arbitrary choice of cut-off percentages; the second one is that in this rigid classification there is no room for concept of shareholding dispersion. One of the first studies that underline the importance of shareholding dispersion for the behaviour of the firm is Cubbin-Leech (1983). They argue there are two dimensions of the separation between ownership and control that are crucial to test the hypotheses of managerial discretion: the location of control (external/internal to management) and, more innovative, the degree of control. The degree of control is a continuous variable that measures the discretion which the controlling group has in order to get its own purposes and it is related to its voting power. The arguments of Cubbin-Leech are based on an probabilistic voting model where the Herfindahl index is used to measure the shareholding dispersion.

²³ There is a comprehensive revision of the literature of ownership and capital structure and corporate performance by Short (1994), where main results are synthesized and compared to each other.

²⁴ After the analysis of Berle-Means (1932) there are a lot of articles from Monsen *et al.* (1968) to more recent as Zeckhauser-Pound (1990) or Leech-Leahy (1991).

In our work we try to imitate the methodology with different tools and to apply the same idea of degree of control.

The first step is to create an index of concentration of ownership without differentiating between external or internal (managerial) ownership. Following a procedure close to the one used in Prowse (1992)²⁵, we define CONC as the sum of the first three large shareholders' share percentage. This so-defined group is the major shareholding for every company.

As we already pointed out, a highly concentrated ownership should be a good proxy for, *ceteris paribus*, lower agency costs. *Vice versa* the presence of a dispersed shareholding is the ideal condition for highest monitoring costs. All this said we expect that in a more concentrated firm more control on management implies (*ceteris paribus*) a higher long-term debt level. Also, a positive relation between MAT and CONC is expected.

4.4.2 Dispersion between major shareholding

In order to better specify the degree of control and try to look for a good substitute for the Herfindahl index (Cubbin-Leech, 1983), we calculated the variance (VA) of share percentages of the major shareholding for every company. We well know that this measure does not represent the dispersion of the entire shareholding. However, we could not calculate the variance of shareholding as whole, because we don't know the exact number of company's stockholders. HEMSCOTT database, in fact, provides information on firms' major shareholding only above a "cut-off quota" of 3% in case of external shareholders and 1% in case of managers. Nevertheless, we can consider VA as a proxy of the degree of control inside the major shareholding and, indirectly, in total shareholding. The value of VA increases when there are major shareholders with more and more different amount of shares between each other. For instance, taking into account the case of Jacques Vert Comapany, the first shareholders owns about 30% of shares, the second one has about 12% and the last one around 5%. It is extremely likely that inside the major shareholding the first shareholder has much power and control than the other two, but even inside the total shareholding the first stockholder has the highest

²⁵ We do not log-linearize and use the first 3 major shareholders, not 5 as in Prowse.

degree of control. In the latter case, VA becomes an indirect proxy of the dispersion of the entire shareholding.

We argue that the higher the VA, the more we can identify a unique major shareholder. Taking a step forward, we can argue that the profile of only one owner might be the definition of large shareholder. We don't put a cut-off quota to define who is a large shareholder²⁶, but we assume that who has an amount of shares much larger than other shareholders (in this case VA is really high, such as in the Jacques Vert Company example) plays the role of large shareholder.

As far as theoretical predictions are concerned, we remind that the "large shareholder hypothesis" has not a straightforward conclusion about the impact of the large shareholder presence on debt maturity. On one side, by Friend-Lang (1988) study we expect a negative relation between MAT and VA. On the other side, by Zeckhauser-Pound (1990), we expect an opposite relation. The lack of precise reference let us test both of these different hypotheses.

Finally, in order to specify some other aspects on ownership structure and some possible influences of them on debt maturity, three dummies are included in the regressions: INSTIT for institutional investors, MAN and JMAN for managerial ownership.

4.4.3 Institutional Investors

The dummy INSTIT represents the presence of institutional investor inside the major shareholding. We suggest a positive relation between debt maturity and the presence of investors as shareholders.

4.4.4 Managerial Ownership

There are two dummies representing the internal ownership. In particular, MAN represents the owner-manager inside the major shareholding, while JMAN represents a manager who has some quota of shares of his/her company. He/she can belong to major shareholding or not.

In both cases we predict a positive relation between MAT and MAN and JMAN.

²⁶ Contrary to Zeckhauser-Pound study (1990) where large shareholders are defined as single entity owning more than 15% of outstanding voting stock.

5. Results

5.1 Descriptive statistics

5.1.1 Descriptive Statistics for economic variables

Tab.1 reports descriptive statistics for only economic variables, MAT, MTBV, SIZE, QUAL, ASSMAT.

Tab.1: Economic descriptive statistics

	MAT	MTBV	LnMV	SIZE	QUAL	ASSMAT
Mean	0.490286	1.776097	11.61311	11.7889	0.831091	1.999139
Median	0.533393	1.210293	11.50953	11.69209	-0.03242	1.243343
Maximum	1	16.01459	16.93873	17.16337	242	54.7378
Minimum	0	0.188287	4.934975	6.475814	-22.1664	0
Std. Dev.	0.337905	1.898919	2.012613	2.00127	17.33349	4.046761
Observations	200	200	200	200	200	200

The dependent variable *MAT* is represented by total loan capital to total debt. *MTBV* is the ratio of market value of total assets to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. *SIZE* is the natural logarithm of total sales in constant 1990 prices. *QUAL* is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . *ASSMAT* is the ratio of total net fixed assets to total depreciation. Finally, *lnMV* is the book value of assets minus the difference between the market and book values of equity.

As far as the extreme observations concern, we checked the frequency distributions for every variable in all period 1990-1999 and we found some extreme values for *MTBV*, *QUAL*, *ASSMAT*. Similarly to the approach of Barclay-Smith (1995), we considered in year 1999 of our cross sections the range of values where 99% of observations fall. Then, with regards to the values outside this range, we checked the economic conditions for every outlier in order to make sure of the exactness of these extreme observations. Finally, we dropped those that influenced the regressions because of the lack of a good economic rationale²⁷.

²⁷ An alternative way is proposed by Stohs-Mauer (1996) in order to avoid to use arbitrary cut-off points to drop the extreme observations. They run a pooled time series cross sectional regression of *MAT* on the independent variables and they checked the influence of extreme values on this regression.

By following this methodology, MTBV's values are in the range 0.188 and 16.014; 99% of observations are between 0.188 and 10.92. We discarded the observations greater than 15.

The range of QUAL is 242 and 22.166; 99% of observations are between 5.68 and -13.97. We dropped observations greater than 6 and -14.

Finally, for ASSMAT values the range is between 0 and 54.73 and 99% of observations are between 0 and 8.78. We discarded observations greater than 10.

Discarding these observations has a material effect on the significance of some coefficients. In particular, in the regressions without "outliers" MTBV is significant at 12% level and QUAL is widely significant different from zero. On the other side, in the regressions on "cleaned database", MTBV becomes more significantly different from zero, while QUAL becomes insignificant. However, discarding these outliers has a little impact on the other variables.

With regards to SIZE, all observations are equally distributed into wide range from 17.31 to 6.26²⁸.

In Graphs 1C we report dispersions for each above mentioned variable in order to show the "outliers".

In regard to correlations, reported in Tab.2, we observe that the signs of correlations between MAT and all independent variables are consistent with the empirical expectations that we have presented above. The only one exception is QUAL that has a positive correlation with MAT. Further, we note that the correlations between variables are quite small.

We wanted to add in this table even the alternative measure of company's size, $\ln MV$ ²⁹, in order to compare its correlation with those of SIZE. We underline that $\ln MV$ has a little higher correlation with other variables than SIZE. We have preferred the measure SIZE instead of $\ln MV$ to avoid some distortions in the estimates due to a correlation problem between variables.

We want to underline in this section the small correlation between MAT and ASSMAT. We report some details on a brief analysis, carried out on relation between

²⁸ We highlight here the importance of the variety of different firms' sizes relating to ownership literature. One of the main problems in the previous works on ownership structure's influences was that the sample of the companies was prevalingly concentrated a sample of large company. This created certainly some bias in the regressions (Lawriwsky, 1984). With our random sample we avoided this kind of error.

²⁹ The natural logarithm of market value of the firm scaled by constant prices.

these two variables. We depicted the trends for both variables across all sample period and all firms and we found MAT is very stable over the decade, while ASSMAT varies widely across firms(due to firm specific features), but not so across years.

Then, from correlation point of view, we notice a slightly positive correlation, opposite to previous studies (Stohs-Mauer, 1996; Ozkan, 2000) where the strong positive correlation confirms and supports robustly the “industrial paradigm”. Our result is likely to be influenced by an endogenous effect that we will try to eliminate with the cross-section average 1999 (we will carry out a deeper analysis in the following).

Tab.2: Correlations Matrix

	MAT	MTBV	lnMV	SIZE	QUAL	ASSMAT
MAT	1	-0.16209	0.443342	0.404724	0.063203	-0.017287
MTBV_N	-0.16209	1	-0.106018	-0.080222	-0.00944	-0.041569
SIZE	0.443342	-0.10602	1	0.94508	0.00276	-0.012542
SIZE_BIS	0.404724	-0.08022	0.94508	1	0.04186	-0.138388
QUAL	0.063203	-0.00944	0.00276	0.04186	1	-0.017188
ASSMAT_R	-0.01729	-0.04157	-0.012542	-0.138388	-0.01719	1

The dependent variable *MAT* is represented by total loan capital to total debt. *MTBV* is the ratio of market value of total assets to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. *SIZE* is the natural logarithm of total sales in constant 1990 prices. *QUAL* is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . *ASSMAT* is the ratio of total net fixed assets to total depreciation. Finally, *lnMV* is the book value of assets minus the difference between the market and book values of equity.

5.1.2 Descriptive statistics for ownership variables

The first main result on the ownership variables regards CONC, measure of concentration between the English companies sample.

CONC is the sum of percentage of shares owned by the first three shareholders. Opposite to a huge literature that traditionally classifies UK companies as typical public companies, we found in our sample a surprisingly high value of CONC. We went through the analysis of the percentage held by the first, second and third shareholder in order to better investigate this fact. We report in Graphs 2C,3C,4C the cumulated distributions for each of the three shareholders. From these graphs, we can notice that in 142 cases the first shareholder owns up to 20% of shares, while in 187 cases the second one posses up to 20%. More in detail the cumulated distribution of ownership is

concentrated, for the first shareholder, in the range 20-30; for the second shareholder in the range between 0 and 10.

For the third shareholder, we see a distribution concentrated in first range (0-10), but in comparison with the other previous two, but the actual figure is lower. In fact, only 38 firms have a third shareholder with at maximum 10% of shares. Moreover, only 44 English companies have a third big shareholder.

From that we can deduct there is no big difference between first and second shareholder condition and in almost all cases the first two shareholders can be called the hard-core of companies. Nonetheless, we thought it right to take into account even the third shareholder.

By summing these three degree of percentage we obtain what we called the major shareholding as a proxy of the concentration of English ownership structure.

Even for the CONC we outlined an accumulated distribution of percentage owned by the major shareholding (graph 5C). We can notice for about half of sample that the major shareholding has at least 20% of shares up to 40% . If we recall numerous studies during the 90s on classification between bank-oriented and market-oriented countries, we find that the percentage of 20% or 25% (Franks-Mayer, 1995) is considered a cut-off point to distinguish these two different typologies of economies. To quote a brief piece of an article of Mayer (1994): "...Banking economies have small proportions of quoted companies; high concentrations of ownership and long-term relations between banks and industry. Market companies have high proportions of quoted firms, low concentration of ownership and short-term relations between banks and industry...".

Furthermore, we find that UK with US (and Canada also) are the most representative market-oriented countries³⁰.

So, the result of our analysis is more surprising. The English "public company" myth has to be revised!

On the basis of our database we define public the company that has all private investors owning in total no more than 3% and all directors owning no more than 1%.

³⁰ The published and unpublished works on this topic are very numerous. Here we want to mention only some of them: almost works of Mayer (1988, 1990, 1994, 1995), Berglof (1990, 1997), La Porta *et al.* (1996, 1998), Bond-Jenkinson (1996), Barca (1994a, 1994b).

In our sample only 1% of firms is “public company”, there is no case of totally concentrated firm (that means, only one owner with 100% of shares) and about 2.5% of firms have a major shareholding with more than 70% of stocks.

This result is aligning with the evolution of economic and financial structures that involved the major developed countries since the mid of 80s. First changes were in financial markets and bank systems around Continental Europe, US and even Japan³¹. Inevitably this fact implicated an adjustment of ownership structure to the modified market’s conditions. As a result, now we ascertain a more concentrated ownership across the studied companies.

Our second variable, VA, used to specify CONC, shows a similar result. VA is the percentages’ variance of major shareholding. It indicates the dispersion of ownership between the first three shareholders. As far as VA behaviour concerns, VA is equal to 0 in case of public company, because we don’t have a major shareholding, but only a dispersed shareholding. The value of VA increases when there are shareholders with more and more different amount of shares into each other until the extreme case with only one major shareholder. Our database shows 5 companies with a major stockholder, but the measure of VA tell us how much majority has this only one owner in respect to the entire shareholding. In fact, the highest value of VA is equal to 0.205 for the firm where the only major shareholder owns 78.5% of shares. So, we argue that VA could be an index of dispersion in the entire company shareholding.

Moreover, from cumulated distribution Graph 6C the dispersion between major shareholders is not high. In fact, more than an half of sample has a dispersion between 0 and 0.5. This confirm the result of CONC in regard to the hard-core of first and second major stockholders.

However, from the Tab 4 of the correlations between ownership variables, we can notice an apparent inconsistency with the theoretical predictions and an incoherence between CONC and VA regarding the correlations’ signs. This observation makes us able to come to the consideration that these two variables don’t move necessary together. CONC refers to a sum of percentages, while VA is a measure of dispersion of this sum. We can have VA equal to zero (besides the public company

³¹ We remind briefly the numerous “Big Bang” in the financial markets since 1984 in France, 1986 in UK and in US, 1992 in Italy and Germany, more recent in Japan (1996).

case, above mentioned) with both high level and low level of CONC . It is enough, in fact, that all three shareholders own the same amount of shares. So, we have to pay attention when we interpret the results of estimations.

Tab.3: Ownership descriptive statistics

	CONC	VA	JMAN	INSTIT	MAN
MEAN	0.322154	0.008461	0.4	0.85	0.225
MEDIAN	0.29485	0.001309	0	1	0
MAX	0.8079	0.205408	1	1	1
MIN	0	0	0	0	0
DEV.ST	0.163878	0.02073	0.491127	0.357967	0.41863
Observations	200	200	200	200	200

CONC is the sum of the first three large shareholders' share percentage. *VA* is the variance of share percentages of major shareholdings. *JMAN* and *MAN* are dummies for managerial ownership. *INSTIT* is dummy for institutional investors.

Tab.4: Correlations Matrix

	MAT	CONC	INSTIT	JMAN	MAN	VA
MAT	1	-0.12559	0.082248	-0.20503	-0.10819	0.04635
CONC	-0.12559	1	-0.14049	0.265585	0.243076	0.581904
INSTIT	0.082248	-0.14049	1	-0.20008	-0.31018	-0.10474
JMAN	-0.20503	0.265585	-0.20008	1	0.562147	0.099096
MAN	-0.10819	0.243076	-0.31018	0.562147	1	0.062286
VA	0.04635	0.581904	-0.10474	0.099096	0.062286	1

CONC is the sum of the first three large shareholders' share percentage. *VA* is the variance of share percentages of major shareholdings. *JMAN* and *MAN* are dummies for managerial ownership. *INSTIT* is dummy for institutional investors.

At this point, also, we need to ask: “Who owns English companies?” in order to better interpret the “new” discovered feature of English ownership concentration.

Thanks to the ownership dummies added to the original model, we were able to better specify the nature of the English ownership.

Firstly, with dummies *MAN* and *INSTIT* we found that the ownership in analysed sample is divided between managers (or executive directors from HEMSCOTT definition), institutional investors and other. For us “other” means private investors (we have cases of family-control) and other no-financial companies.

In particular, from Graph 7C we can notice that in 23% of companies there are managers as major shareholders, while the presence of institutional investors is relevant in 85% of cases.

The 23% of managerial ownership means that about one fourth of English companies is controlled (in the proper sense of managerial literature) by managers. Moreover, if we see the results for other managerial dummy, JMAN, we notice that 40% of total shares is owned by managers. However, unclear correlations, negative (opposite to the expectations), between MAT and MAN and between MAT and JMAN lead us to think that the presence of managerial ownership is not so strong. This fact could be related to more pervasive presence of institutional investors.

As far as institutional investors are concerned, we went ahead in the analysis of the identity and typology of “institutional investors”.

We divided all institutional investors in two main category on the basis of Brickley *et al.*: on the one side, the so-called “cherry picking” investors (investors interested only in capital gain, quoting Coffee (1991), “more in liquidity than in control”) as investment trusts or investment companies, pension funds and specialists in financial affairs³², on the other side, bank and insurance companies as banks, investment banks, insurances and life insurances.

Among the investors that we found, there is a group of them, named “unknown”, in which there are no-listed and foreign institutional investors not collected by HEMSCOTT.

This classification is useful to test if different incentives of different types of investors can explain the results in our estimations.

Graph 8C shows the presence of “cherry picking” investors is greater than banks and insurances. Moreover, if we consider the mixed group that represents the major shareholding where all types of investors are included, we can argue that the almost English companies are dominated (owned) by “cherry picking” investors. That doesn't mean the market is controlled by this kind of investors, because in our work we don't take into account the capitalization of companies. So, we don't have the target to know how much portion of the stock market is owned by banks or others.

In a recent study (Gros-Pietro *et al.*, 2000) focused on the evolution of ownership structure and financial markets around the Europe, authors argue that in UK almost shares in the stock market are hold by the main banks and insurance companies, namely, Schrodgers, Prudential, Legal, STD and AXA.

³² The category's definition from HEMSCOTT is not so clear. The exact denomination of this particular sector is “Speciality and other finance”.

In our analysis we did not weighted the amount of shares hold by investors, but we considered only the presence of these investors in major shareholding. This could be a good reason explaining the difference of results on the type of ownership in English companies between our work and the above mentioned study.

The positive correlation between INSTIT and MAT could be consistent with expectation that “cherry picking” investors are not interested in the firm’s business and don’t monitor strongly the management. However, it could be consistent even with the suggestion that the other type of investors, investment banks and insurances, are more involved in the company, but they can exercise a stronger control by voting rights instead of higher short-term debt level.

5.2 Regression Results

We run two different kinds of cross-sectional studies. The first one features 1999 as base year (CS 99) and the second one is a cross-section “average” (CS Average). By following the approach of Rajan-Zingales (1995), in the latter regression all regressors are averaged over four years prior to the base year (1996-1999). In this way, it is possible minimize noises and take into account slow adjustments over years. Moreover, this approach allows to keep endogeneity issues explicitly into account.

The first regression regards only the economic variables for both types of regressions in order to highlight the differences and try to give some comments (Tab.5, 6, 7). In this stage we want to replicate the same estimates of previous studies in order to have an opportunity to compare it each other.

Preliminarily, we have estimated our regression with the total database. That means, we have allowed for outliers in MTBV, QUAL and ASSMAT. The goodness of results was not satisfying, so we decided to clean the database from the wider outliers in order to avoid some distortions, as explained above.

From Tab.5 we can notice that in CS00 and CS Average MTBV is significant and with expected negative sign. This confirms the “cost-contracting” hypothesis: firms with more growth opportunity will suffer a greater underinvestment problem. As a

consequence, they will issue more short- term debt. This result is aligning with all previous studies, but Stohs-Mauer (1996).

Tab.5: Firm-specific effects: economic variables

Dependent Variable: MAT			
Method: Least Squares			
Sample: 1 196			
Included observations: 196			
White Heteroskedasticity-Consistent Standard Errors & Covariance			
Variable	Predicted Sign	CS 99	CS AVERAGE
C		-0.213591 (-1.552872)	-0.237371 (-1.718845)***
MTBV	-	-0.038888 (-2.655374)*	-0.062189 (-2.030739)*
SIZE	+	0.063366 (5.933607)*	0.065377 (6.658175)*
QUAL	-	0.004794 (0.412803)	0.005300 (0.837974)
ASSMAT	+	0.012530 (0.735865)	0.035301 (2.151369)**
R-squared		0.197449	0.205287
Adjusted R-squared		0.180642	0.188378
F-statistic		11.74778	12.14082
Prob(F-statistic)		0.000000	0.000000

The dependent variable *MAT* is represented by total loan capital to total debt. *MTBV* is the ratio of market value of total assets to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. *SIZE* is the natural logarithm of total sales in constant 1990 prices. *QUAL* is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . *ASSMAT* is the ratio of total net fixed assets to total depreciation. The t-statistics are reported in parentheses. Significance values are reported as:

*** ten percent

** five percent

* one percent

Another significant variable in both regressions is *SIZE* with the predicted positive sign. This result support the hypotheses of Titman-Wessel (1988) on the possibilities for a larger firm to access to every capital market than smaller; the hypothesis of Whited (1992) on the collateralizable assets for larger than smaller firms. As a result, smaller companies are likely to issue more short-term debt.

As far as *ASSMAT* is concerned, the coefficient is not statistically different from zero in CS00, but it becomes more significant in CS Average (significant at 3% level). It could be possible that this difference in results depends on some endogenous influence of *MAT* on *ASSMAT*. It's likely that in the same year a certain level of long-

term debt can have an effect on the assets purchasing policy. So, the average of 4 years of independent variables would mitigate these distortions.

Also, the sign of ASSMAT is supporting in both of cases the “industrial paradigm”: matching the maturity of debt with the maturity of assets.

This result is in line with Ozkan (2000) and Stohs-Mauer (1996).

Finally, the coefficient of QUAL is inconsistent with the “signalling” hypothesis in both regressions.

The goodness of fit is quite satisfactory, relatively high for a financial econometric analysis. In CS00 and CS Average is about more than 18%.

We checked the misspecification by a RESET- test. Both models are not misspecified, with a Fitted value not different from zero at 34% in CS 99 and 24% in CS Average.

At the second stage we added 13 dummies representing every sector. We want to consider the relative importance of industry-specific effects. In order to do so, we checked the jointly-significance of dummies, the changes of adjusted R-squared and, finally, the probable effects on other regressors.

From Tab. 6, in both models the F-statistic for industrial dummies seems to indicate that the dummies are not jointly different from zero (F-statistic= 1.09 in CS00 and is equal to 1.39 in CS Average). In regard to the goodness of regression, the adjusted R-squared decreases in CS 99 from 18.06% to 18.03%, while it increases a bit from 18.83% to 20.17% in CS Average. Finally, adding these dummies has not a big impact on the regressors that previously were significant in both of models (MTBV and SIZE). However, it has a material effect on the other two regressors. In fact, the significance of QUAL increases and the significance of ASSMAT increases too. Moreover, the sign of QUAL changes in CS 99.

There are no strong evidences in favour to a misspecification hypothesis. However, all the evidence shows that industry-specific effects seem to play little role in determining the debt maturity policy. Moreover, we tried to classify the first ten companies on the basis of decreasing MAT level in order to see some correspondence between the level of long-term debt and the belonging to particular sector. However, we did not find any correspondence or economic rationale and we consider that a little support to the non significant results of our regressions.

Tab.6 Industrial Effects: dummy variables.

F-statistic CS 99	1.091430	Probability	0.369
F-statistic CS Average	1.392200	Probability	0.166

Dependent Variable: MAT

Method: Least Squares

Sample: 1 196

Included observations: 196

White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Predicted sign	CS 99	CS AVERAGE
MTBV	-	-0.041884 (-2.572853)*	-0.069985 (-2.289255)**
SIZE	+	0.052272 (4.371323)*	0.055436 (5.089048)*
QUAL	-	-0.000764 (-0.068222)	0.005806 (0.920638)
ASSMAT	+	0.003799 (0.208634)	0.029590 (1.629500)
D1		-0.002839 (-0.013731)	-0.037051 (-0.185161)
D2		-0.039260 (-0.235492)	-0.061795 (-0.373838)
D3		-0.124102 (-0.758318)	-0.166577 (-1.030195)
D4		-0.079356 (-0.491569)	-0.103484 (-0.649813)
D5		0.023799 (0.139904)	0.035045 (0.208211)
D6		-0.284161 (-1.871613)***	-0.334210 (-2.288908)**
D7		0.052434 (0.310393)	-0.027818 (-0.149794)
D8		-0.037670 (-0.198330)	-0.092938 (-0.498214)
D9		-0.043949 (-0.263063)	-0.074202 (-0.462931)
D10		-0.144635 (-1.036470)	-0.190698 (-1.405656)
D11		0.174393 (0.756115)	0.103327 (0.507828)
D12		0.009274 (0.047141)	-0.003548 (-0.018919)
D13		-0.075912 (-0.415206)	-0.129790 (-0.718488)
R-squared		0.247621	0.268295
Adjusted R-squared		0.180369	0.201776
F-statistic		3.681994	4.033379
Prob(F-statistic)		0.000008	0.000002

The dependent variable *MAT* is represented by total loan capital to total debt. *MTBV* is the ratio of market value of total assets to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. *SIZE* is the natural logarithm of total sales in constant 1990 prices. *QUAL* is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . *ASSMAT* is the ratio of total net fixed assets to total depreciation. *DUMMIES* represent the 13 sectors. The t-statistics are reported in parentheses. Significance values are reported as: *** 10%, ** 5%, * 1%.

Finally, at the last stage we considered the ownership variables. With the same methodology used for industrial effects, we wanted to test the impact of some variables and dummies representing specific characteristics of ownership and control structure inside the company and to check if some of them support the hypotheses discussed above.

From Tab. 7, in both models the F-statistics for ownership variables indicate the variables are not jointly different from zero (F-statistic= 0.65 in CS00 and F-statistic= 0.94 in CS Average). The adjusted R-squared is almost the same. These new variables have not any strong impact on other regressors.

In regard to the significance of these variables, we can notice that CONC is not different from zero in both of models (in CS Average the significance is a little greater than in CS 99). Moreover, this variable does not support the “control hypothesis” of Jensen (1986), because its sign is negative. One explanation of that could be the large variety of different types of investors. From the descriptive statistics comments we derive that there are different incentives from different investors (owner-managers, banks and insurance companies, other institutional investors). This fact could have an impact on the significance and on the unclear sign of CONC.

However, the other measure of concentration, namely, the dispersion of shares inside the major shareholding (VA) has a significant effect on debt maturity (at a level of 7% in CS 99 and 5% in CS Average). This result supports the Jensen “control hypothesis” and the hypothesis derived from thesis of Zeckhauser-Pound (1990). Higher dispersion of ownership between major shareholders increases the long-term debt level: just the presence of large shareholding could play the role of signal to the market that managers are less able to take profit reducing investment actions or cash flow expropriation and it may mitigate the need for managers to issue debt as a signal. If the presence of large shareholders is an effective signal, the firm could avoid to do more debt commitment.

The expectation of lower debt level in the companies with large shareholders (proxied by a higher VA) seems to be supported by our results.

Tab.7 Ownership effects: variables and dummies.

Omitted Variables: CONC VA MAN INSTIT JMAN			
F-statistic CS 99		0.651622	Probability 0.660
F-statistic CS Average		0.942880	Probability 0.454
Dependent Variable: MAT			
Method: Least Squares			
Sample: 1 196			
Included observations: 196			
White Heteroskedasticity-Consistent Standard Errors & Covariance			
Variable	Predicted sign	CS 99	CS AVERAGE
C		-0.142989 (-0.643333)	-0.124482 (-0.557322)
MTBV	-	-0.041936 (-2.834063)*	-0.077712 (-2.332444)**
SIZE	+	0.056066 (4.132442)*	0.056118 (4.435776)*
QUAL	-	0.006462 (0.537521)	0.005689 (0.857819)
ASSMAT	+	0.012833 (0.727557)	0.034739 (2.150721)**
CONC	+	-0.156100 (-0.864832)	-0.202276 (-1.147241)
VA	+	1.842137 (1.986516)**	1.896382 (1.908537)***
MAN	+	0.009278 (0.134073)	0.033042 (0.514333)
INSTIT	+	0.073097 (1.073915)	0.096461 (1.433792)
JMAN	+	-0.022675 (-0.379627)	-0.051095 (-0.841637)
R-squared		0.211265	0.225246
Adjusted R-squared		0.173100	0.187143
F-statistic		5.535630	5.911545
Prob(F-statistic)		0.000001	0.000000

The dependent variable *MAT* is represented by total loan capital to total debt. *MTBV* is the ratio of market value of total assets to book value of total assets, where the market value of total assets is measured by the book value of assets minus the difference between the market and book values of equity. *SIZE* is the natural logarithm of total sales in constant 1990 prices. *QUAL* is equal to earnings in year $t+1$ minus earnings in year t scaled by earnings in year t . *ASSMAT* is the ratio of total net fixed assets to total depreciation. *CONC* is the sum of the first three large shareholders' share percentage. *VA* is the variance of share percentages of major shareholdings.

The t-statistics are reported in parentheses. Significance values are reported as:

*** ten percent

** five percent

* one percent

In regard to *INSTIT*, it is not significant at all in CS 99 and in CS Average is significant at 15%. Anyway, we can comment its sign. This positive sign could be consistent, in fact, with the hypothesis of “cherry picking” in the market. Some kind of investors, such as pension funds or investment trusts, seem to prefer liquidity against

control and they are not involved in the company's life. As a consequence, their influence on management is not strong and the level of "monitoring debt" (short-term) is not high. From descriptive statistics, we derive that the presence of these investors is really pervasive. However, even considering the other type of investors, such as investment banks and insurances, more involved in the company, we could obtain the same results. In fact, banks and insurance companies can exercise a stronger control by voting rights instead of higher short-term debt level. The result does not change: a positive relation between MAT and INSTIT.

Finally, the analysis allow us a brief comment on managerial dummies. MAN and JMAN, proxies of some degree of manager's ownership seems to have not any influence on debt maturity policy in both of models. The positive sign of MAN could support the "risk aversion" hypothesis: a riskier owner manager will not prefer to run the illiquidity risk when he/she could not be able to meet the payments. The out-of-pocket flotation costs of short-term debt would be for him/her higher than for shareholder with well diversified portfolios. Moreover, the positive sign seems to be aligning with previous considerations about the presence and influence of institutional investors: institutional investors are not involved or they have other monitoring tools and, consequently, they don't force management to short the maturity of debt. On the other side, it is not interest for managers to increase the level of short-term loans.

On this last stage, the RESET test doesn't show evidence in favor to a misspecification problem (the fitted value is significant at about 63% in both of model).

6. Conclusions

This work has examined the determinants of debt maturity structure. There is a huge theoretical literature focused on the choices of optimal capital structure that takes into account, in particular, the influence of debt maturity policy on firm value. These main studies analysed, on one side, the area of Agency Costs (Jensen.Meckling, 1976; Myers, 1977; Titman-Wessel, 1988; Whited, 1992) related to underinvestment problem, growth opportunities, scales economies and, on the other side, the area of Asymmetric Information (Flannery, 1986, 1994; Diamond, 1991; Titman, 1992) related to signalling problem and reputation in the market and, finally, the area of corporate taxes (Brick-Ravid, 1985, 1991; Kane *et al.*, 1985).

Despite of a considerable amount of theoretical studies, there is little empirical work. To the best of our knowledge, only recently some authors tested empirically the theoretical predictions on the determinants of debt maturity structure. The main studies are by Barclay-Smith (1995) and by Stohs-Mauer (1996). Moreover, little was done on debt maturity structure field using non-US data. Our only one rigorous reference on UK non-financial companies work is by Ozkan (2000).

The present study is an attempt to develop these previous works and to make a thorough investigation on the determinants of debt maturity structure in a sample 200 of non-financial UK listed companies between 1990 to 1999.

Besides the determinants analysed by previous literature, we wanted to test a possible relation between Debt Maturity and Ownership Structure. We used two different kind of cross-sectional studies: the first one is a cross-section regression for the year 1999 and the second one is a cross-section average. In the latter, all regressors are averaged over four years previous to the base year (1996-1999). The rationale is that in this way, it is possible reduce noises and take into account slow adjustments over years. Moreover, we can take endogeneity issues into account.

The results of our analyses provide strong support to Myers (1977) “cost-contracting” hypothesis. Firms with more growth opportunity suffer a greater agency problem between shareholders and debtholders. So, they are likely to have a bigger underinvestment problem. As a consequence, they issue more short-term debt in order to mitigate the shareholders’ disincentive to invest. In addition, this result is consistent

to the hypothesis of Titman-Wessel (1988): larger companies have more possibilities than smaller firms to access to long-term capital market. This hypothesis is related to the suggestion of (Whited, 1992): smaller firms are precluded from accessing long-term debt market, because they can offer a really small portion of their future investment opportunities as collateralizable assets. This kind of company are likely to issue more short-term debt.

The evidence of our analysis supports the hypothesis that firms try to match the maturity of debt with maturity of assets in order to minimize problems of agency costs (“industrial paradigm”).

There is no significant consistency, on the other side, with the “signalling hypothesis” (Flannery, 1986): high-quality firms will want to issue short-term debt and low-quality firms prefer long-term debt, because the latter cannot afford to roll over short-term debt and the mis-information distortion, typical of external financing, is lower with short-term debt.

The industrial effects on these variables show any impact on the previous results.

Finally, the innovative part of this work is represented by the ownership variables as determinants of debt maturity.

There is no support to the “control hypothesis” of Jensen (1986): the debt level can reduce the agency costs of free cash flow reducing the cash flow available to the managerial discretion. More concentration indicates more pressure and control on manager via debt creation. In fact, the proxy of concentration CONC is not statistically different from zero in both models and its sign is negative.

On the other side, our work provides a strong support to Zeckhauser-Pound (1990) “large shareholders hypothesis”: the presence of large shareholding can play the role of signal to the market that managers are less able to take profit reducing investment actions or cash flow and this fact may mitigate the need for managers to issue debt as a signal. If the presence of large shareholders is an effective signal, the firm could avoid to do more debt commitment.

There is a weak support to the “institutional investors” hypothesis: investors are not interested in the firm’s business, but “cherry picking” in the market. They seem to prefer liquidity against control (Coffee, 1991) and they are not involved in the

company's life. As a consequence, their influence on management is not strong and the level of "monitoring debt" (short-term) is not high.

Finally, the "managerial ownership hypothesis" is not strongly supported: a riskier owner manager will not prefer to run the illiquidity risk when he/she could be not able to meet the payments. Only MAN is aligning in sign to the hypothesis, but it is not different from zero.

It seems that there is further need to analyse the likely impact of a bigger sample of companies; or more available information on ownership structure even for a longer period in order to run a panel analysis, besides the cross-sections. Moreover, with more information it would be possible to better specify the identity and relations between investors and the mutual influences between institutional investors derived from cross-ownership and interlocking directorship phenomena.

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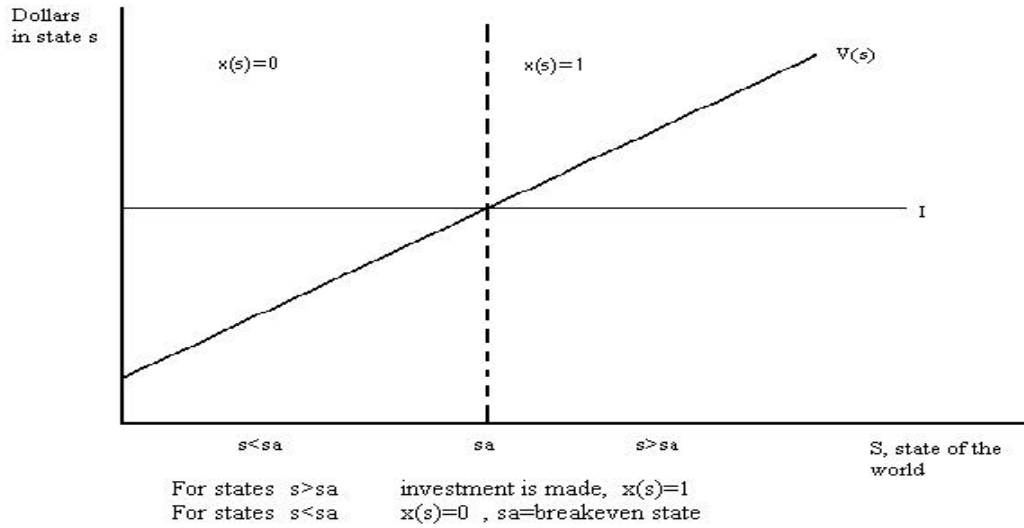
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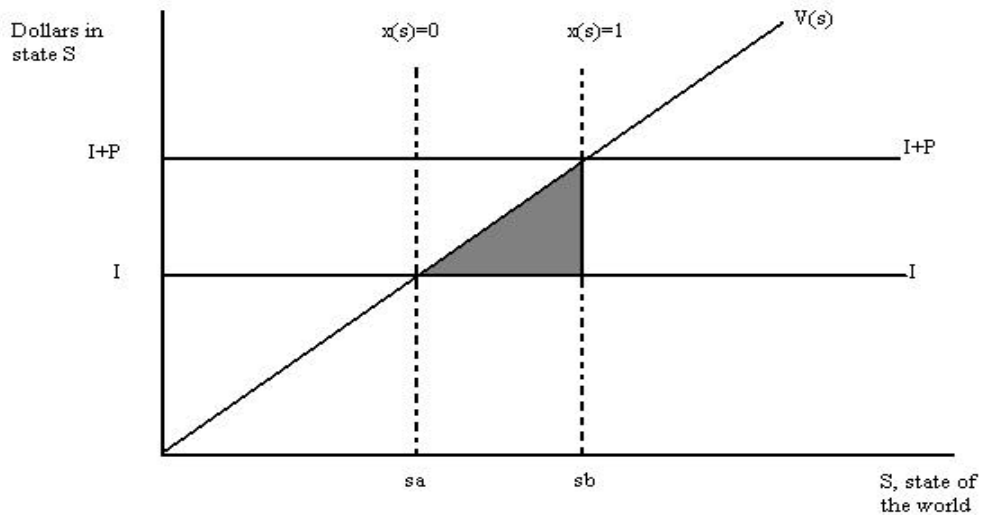
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APPENDIX A

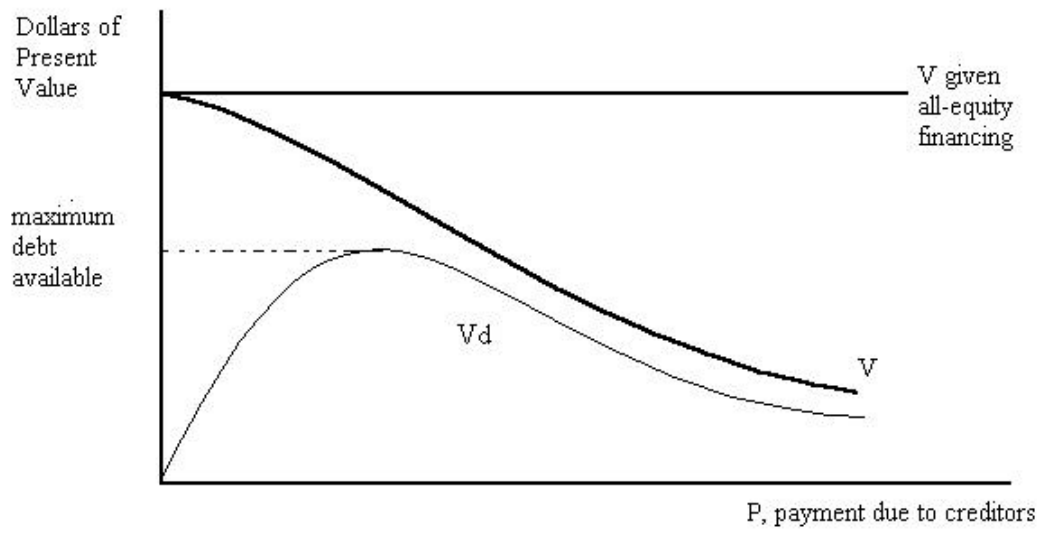
Graph.1: the firm's investment decision in all-equity financing condition.



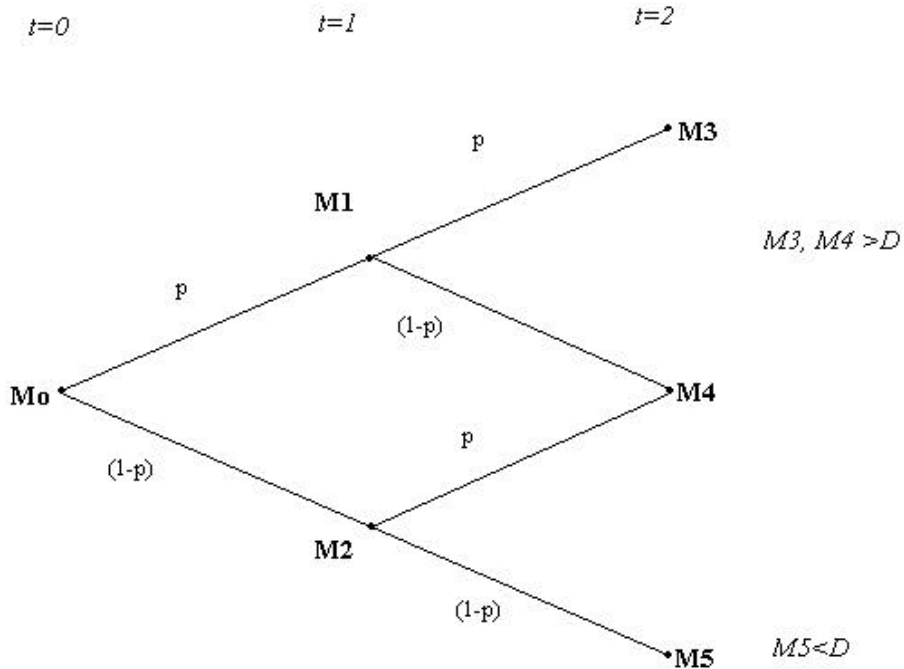
Graph.2: the firm's investment decision with outstanding risky debt.



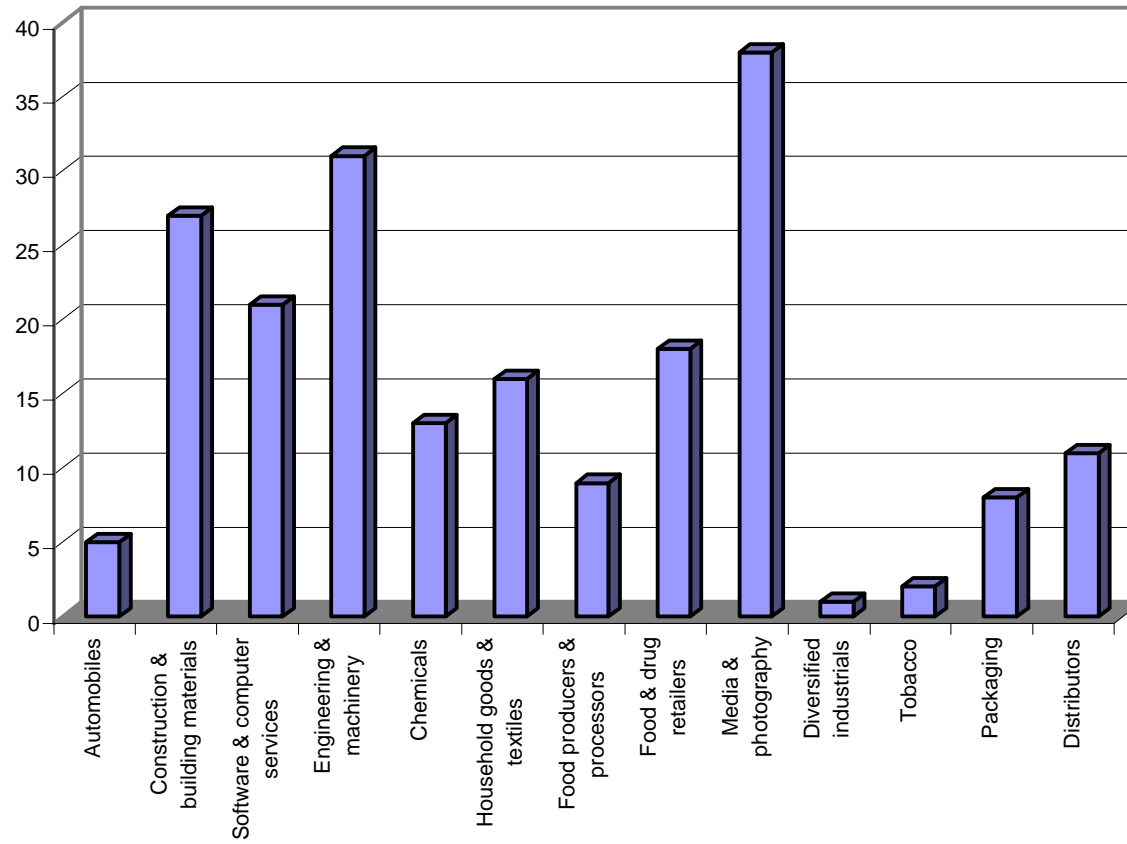
Graph.3: firm and debt value as function of payment due to creditors.



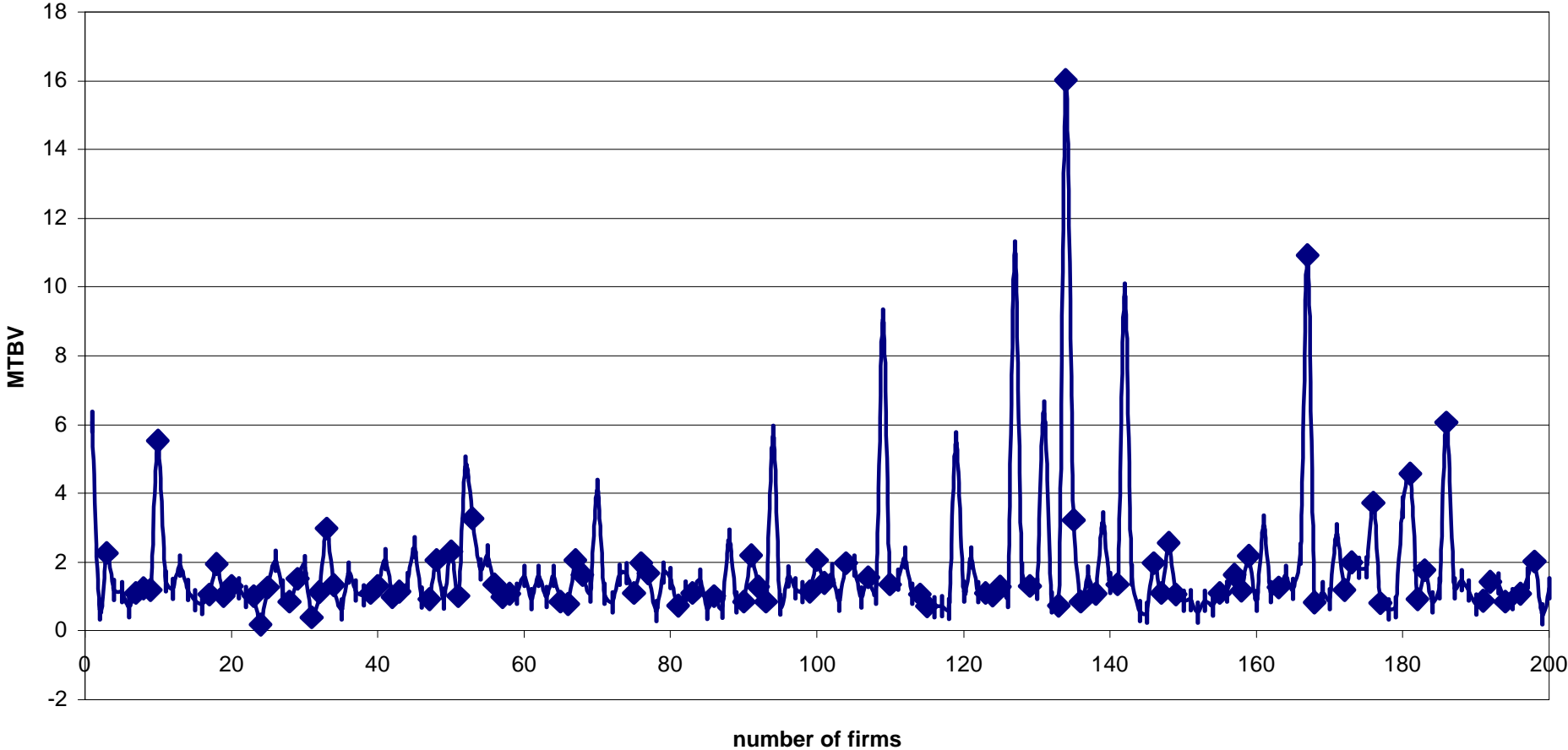
Graph.4: uncertainty about changes in project value.



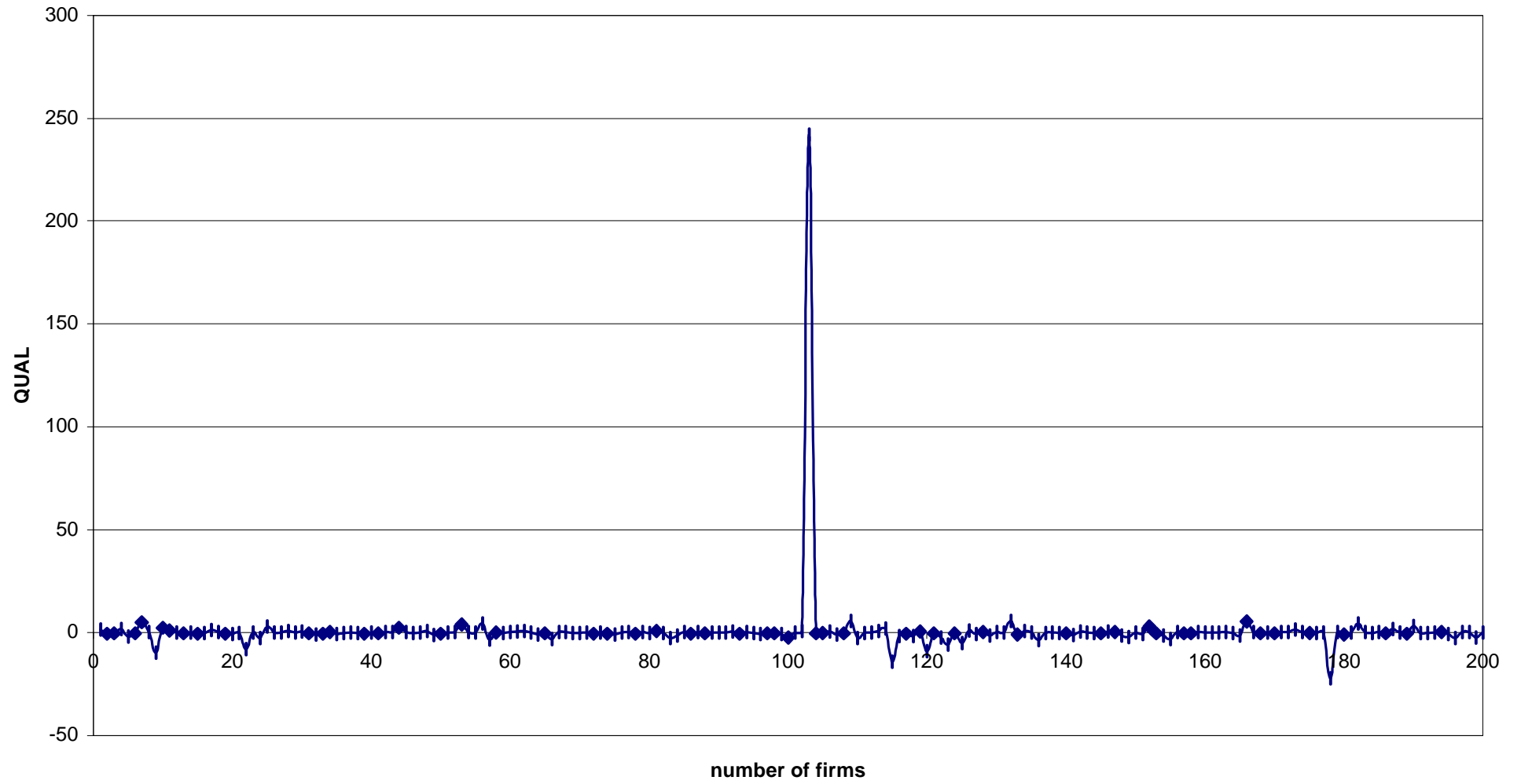
APPENDIX B INDUSTRIES IN SAMPLE



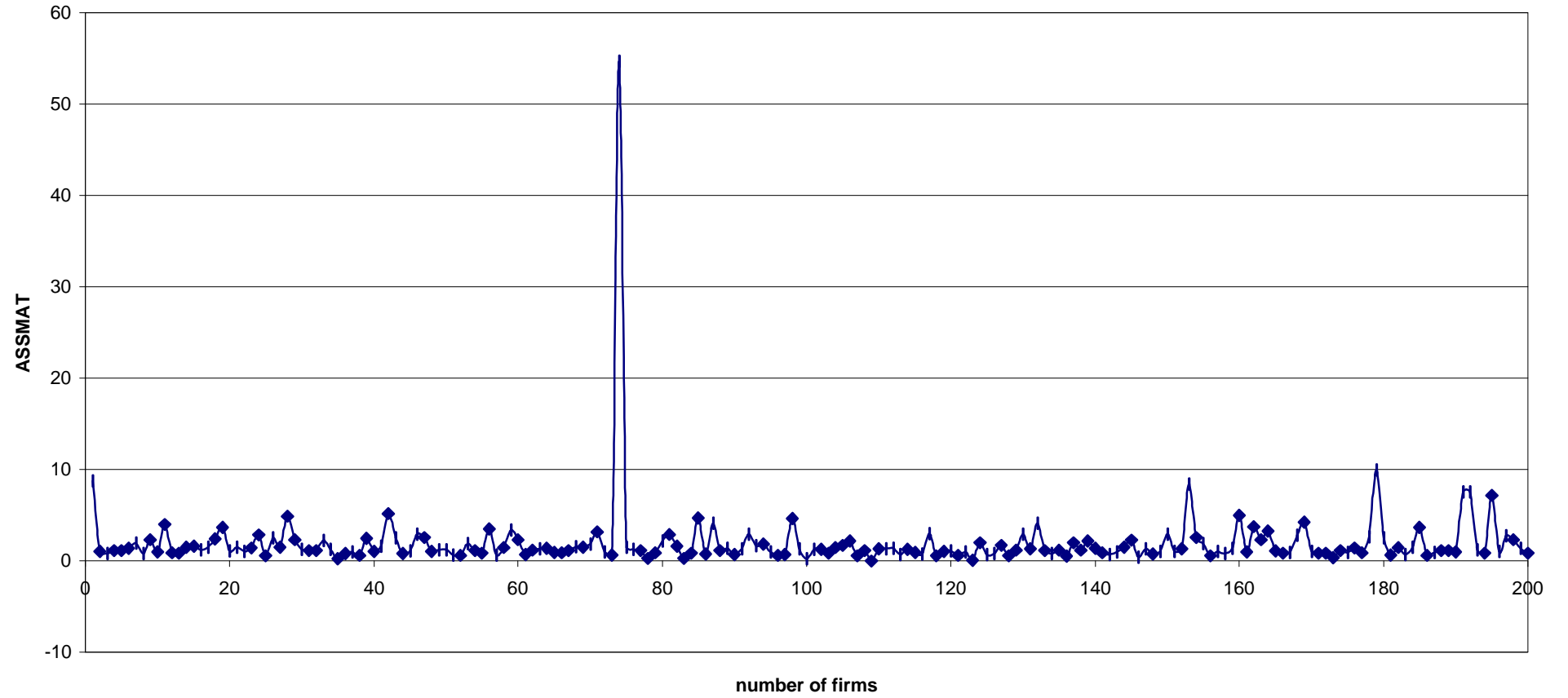
APPENDIX C
Graph1C: outliers MTBV



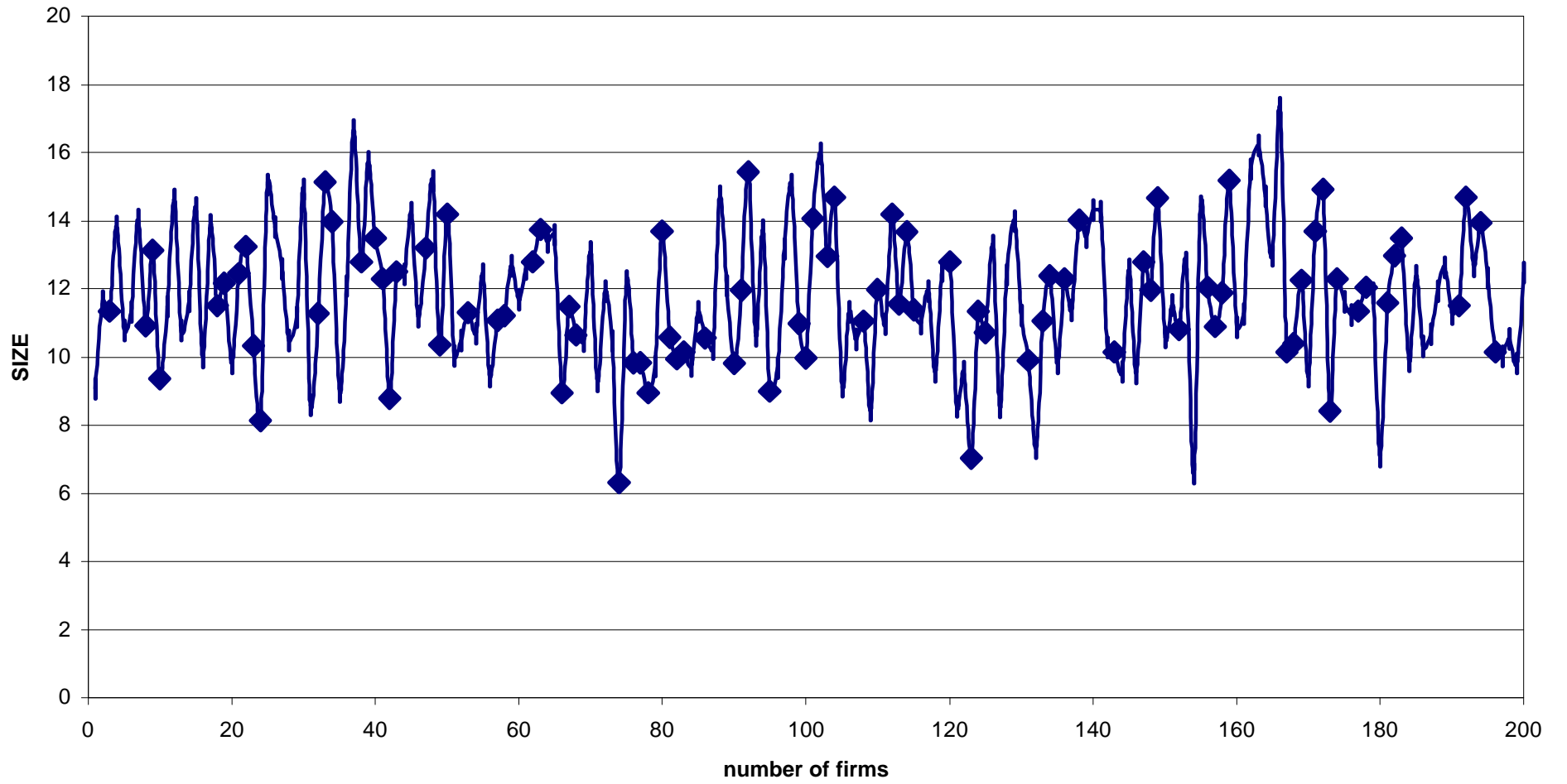
Graph1C: outliers QUAL



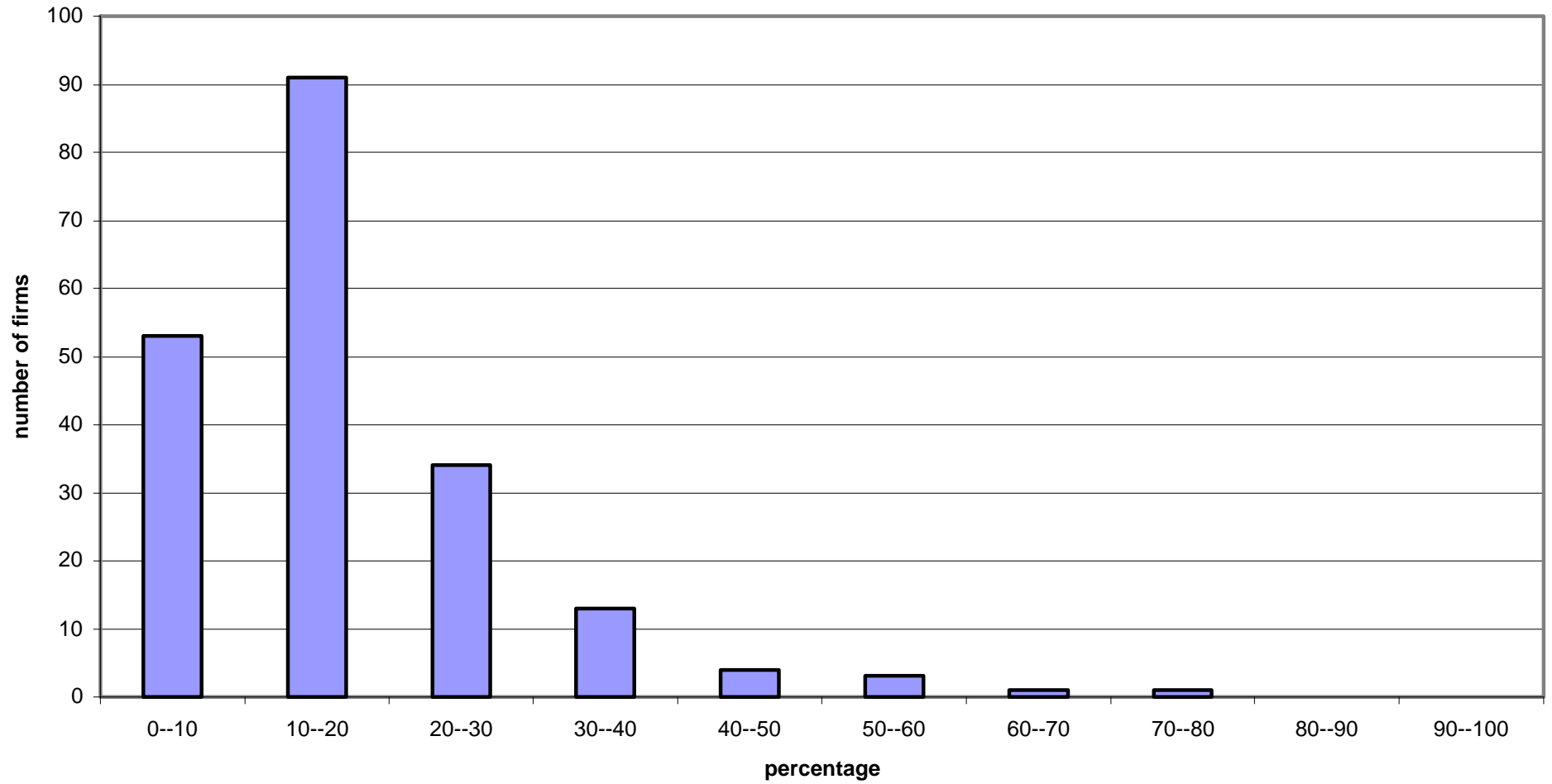
Graph 1C: outliers ASSMAT



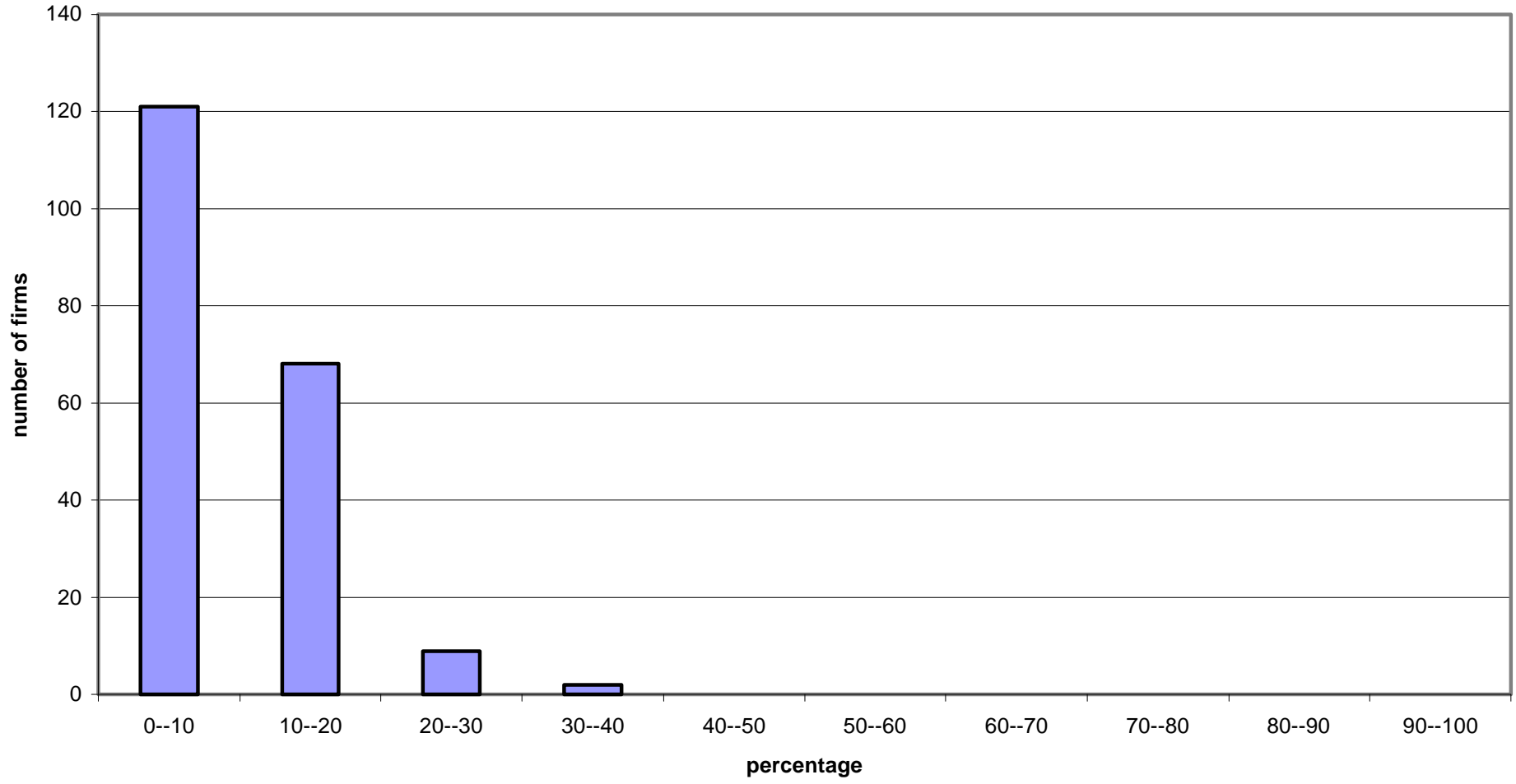
Graph 1C: outliers SIZE



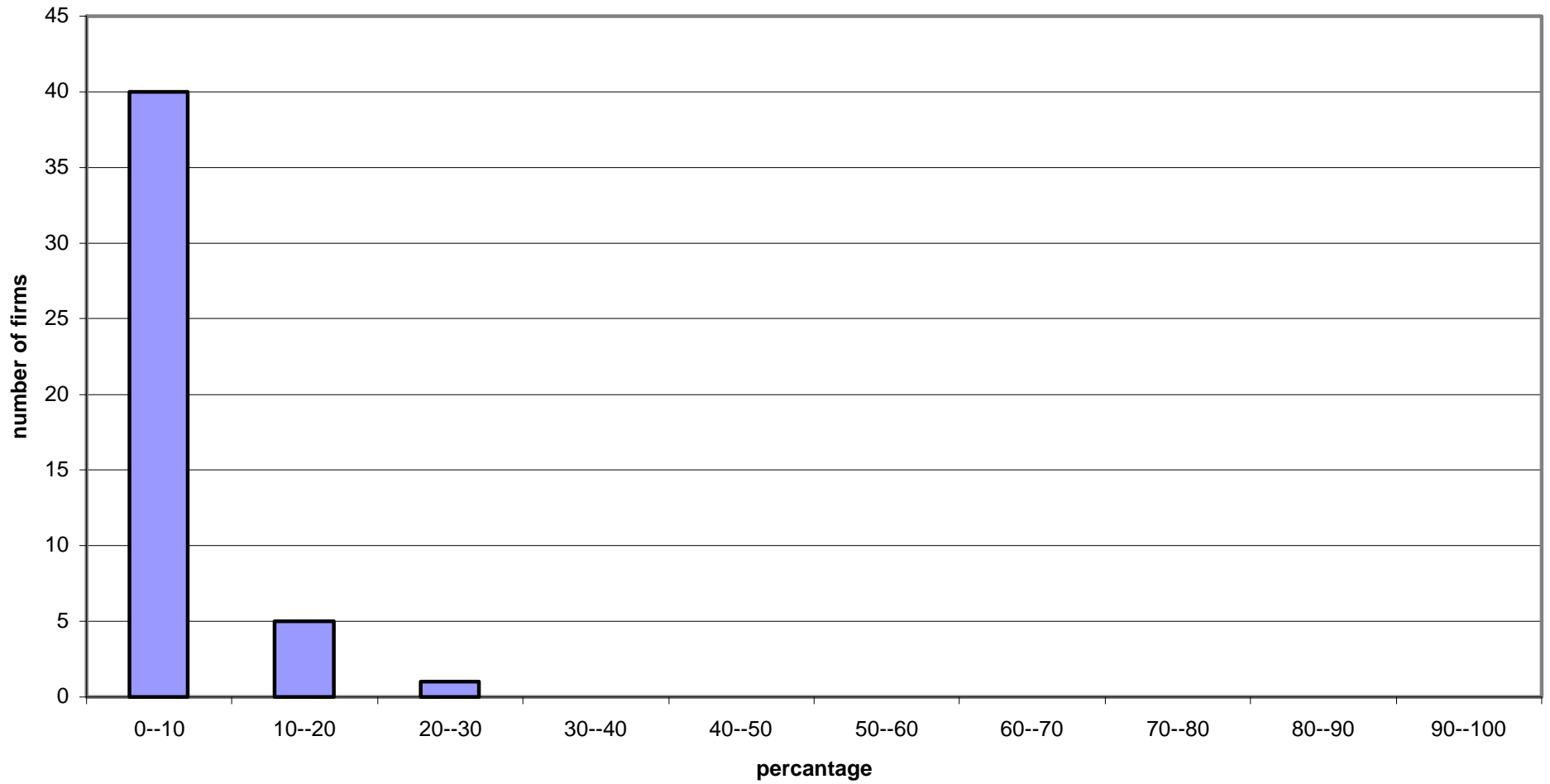
Graph 2C:CUMULATED FIRST S-HOLDER SHARE



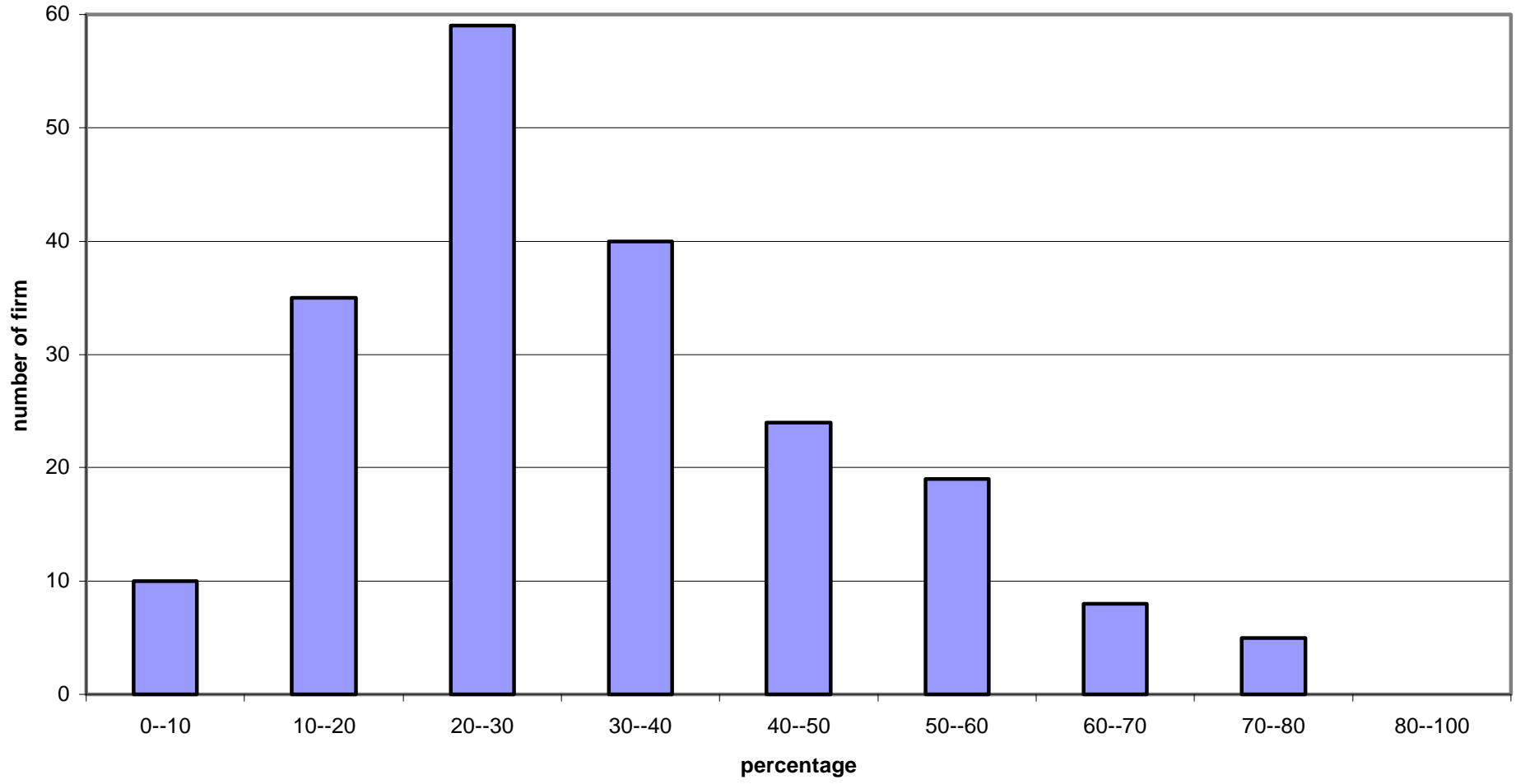
Graph 3C:CUMULATED SECOND S-HOLDER SHARE



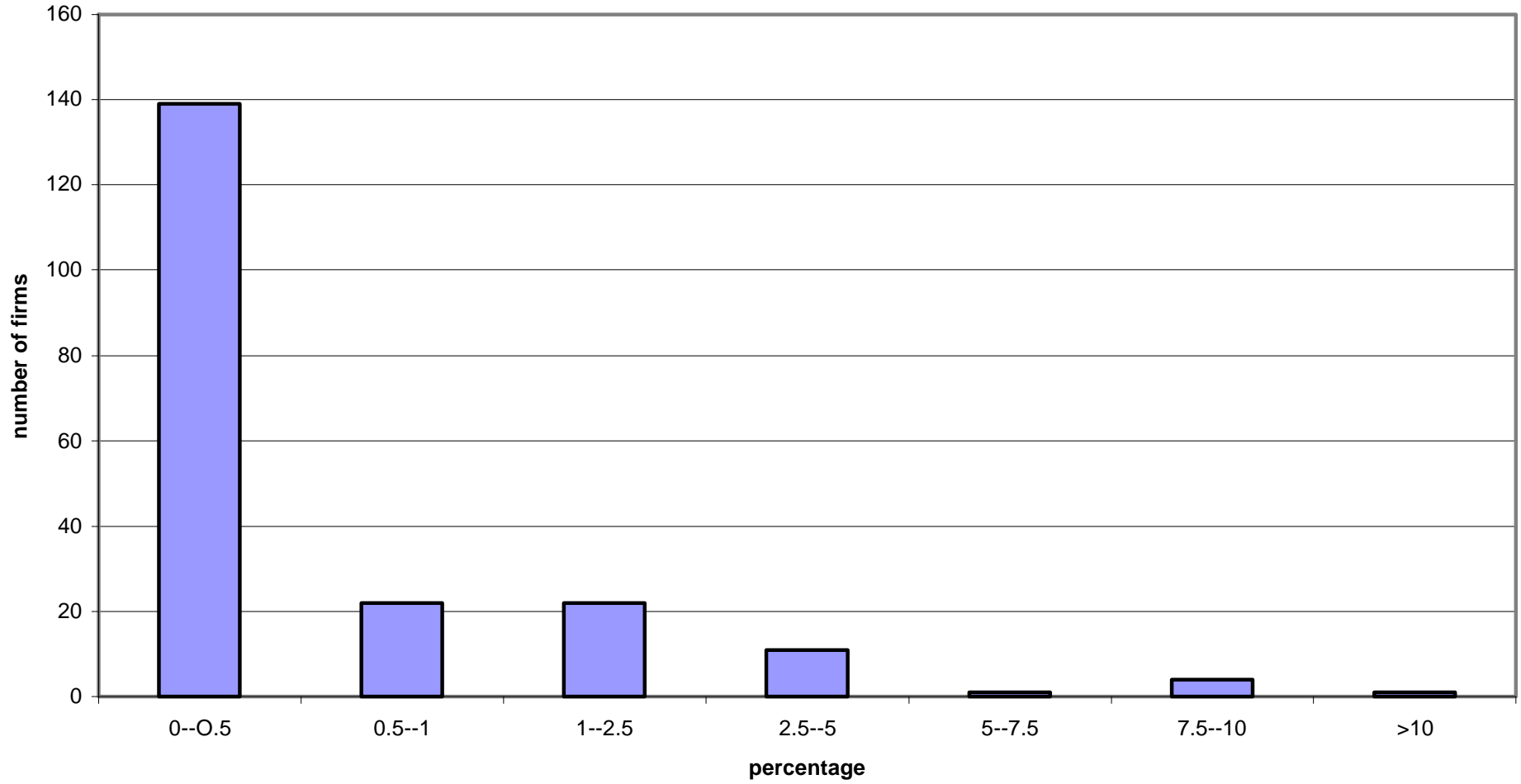
Graph 4C: CUMULATED THIRD S-HOLDER SHARE



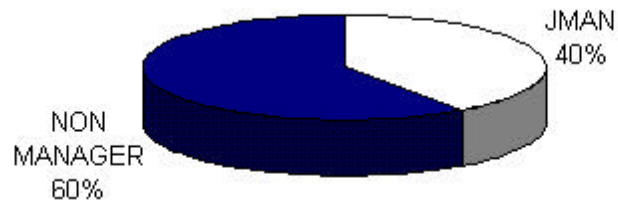
Graph 5C:CUMULATED CONCENTRATION



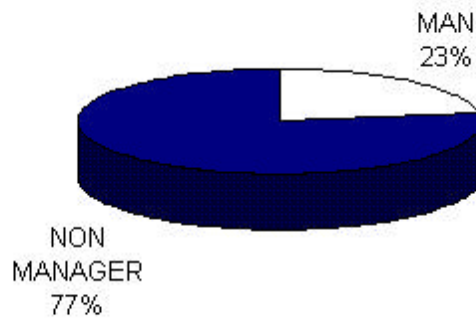
Graph 6C: CUMULATED VARIANCE



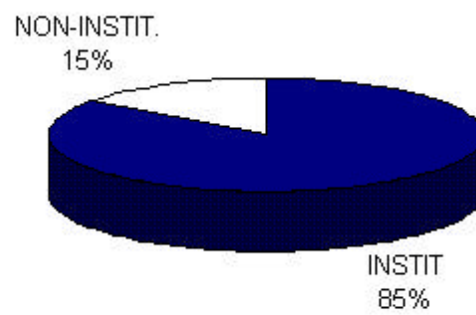
Graph 7C:JMAN



MAN



INSTITUTIONAL INVESTOR



**Graph 8C: MAJORITY OWNERSHIP
BY TYPE OF INVESTOR**

