DETERMINANTS OF THE FIRM'S CAPITAL STRUCTURE THE CASE OF THE VERY SMALL ENTERPRISES

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ABSTRACT

This paper seeks empirically to identify the determinants of the very small firms' financial leverage. This is important because both these enterprises have been under-researched and research in the area has been troubled by samples biased towards very large enterprises. Results support hypotheses that size, growth, operational cycle and entrepreneur's risk tolerance are positively and business risk, asset composition, profitability and inflation negatively associated with financial leverage. Additionally, there is support for a hypothesized relationship with industry but not with enterprise age. To achieve a wider understanding of these relationships, financial leverage is studied in combination with own working capital.

Barclay and Smith (1995 p.609) state that financial economics has made significant progress in explaining the incentives that lead large public corporations to choose particular financing policies. There seems to be no denying of this. This is so much so that, as these same authors observe, the profession is increasingly moving beyond an examination of the basic leverage choice to more detailed aspects of the financing decision. Explaining this basic choice between debt and equity was the emphasis of research in the penultimate decade of the 20th century. The past decade witnessed the appearance of articles extending the literature to examine hypotheses about the determinants of both corporate debt ownership structure and the maturity structure of the firm's debt. Examples of these are the works by Barclay and Smith (1995) and Johnson (1997), respectively. Some empirical work has also been carried out on the effects of moving away from target or optimal debt ratios. An excellent example of this is the work by Hull (1999).

However, the remark by Collins and Sekely (1983 p.45) that empirical tests do not appear to have been conclusive for all postulated determinants of financial leverage still seems to apply. Likewise, the strong statement by Brealey and Myers (1996) that explaining capital structure is one of the 10 unsolved problems in Finance does not seem to have lost any force. Thus, it is believed that there is still a need for new papers that will fill in gaps in the existing literature dealing with capital structure. It is a hope that this paper will detect in its Part I some specific gaps during its task of presenting the results of a reviewing of the corporate empirical research already carried out. Two general areas of neglect may already deserve some comments in the next paragraphs.

With very few, though notable, exceptions, studies are reported for developed countries. According to Errunza (1979 p.75), studies carried out elsewhere are very important in view of the fact that assumptions of perfect and complete capital markets frequently do not hold in countries outside the United States. The modern theory of capital markets, which is based upon these assumptions, may not be applicable to other countries without substantial adaptations. According to Rajan and Zingales (1995 p.1421), empirical work has unearthed some stylized facts on capital structure choice, but this evidence is largely based on firms in the United States. In their view, without testing the robustness of these findings outside the environment in which they have been uncovered, it is hard to determine whether these empirical regularities are merely spurious correlations, let alone whether they support one theory or another.

Different countries have different institutional arrangements, mainly with respect to their tax and bankruptcy codes, the existing market for corporate control, and the roles banks and securities markets play. Rajan and Zingales (1995 p.1422) showed that factors identified as important in the United States were in general similarly correlated with leverage in the other six major industrialized countries despite the existence of variations in institutional arrangements. Level of economic development may make the difference, then. Variations in this factor will be possible if corporate capital structure studies are carried out

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in developing countries, but data availability is still a problem in them. According to Rajan and Zingales (1995 p.1423), the very lack of consistent accounting and market information outside the United States caused previous studies comparing capital structures in different countries to reach conclusions different from theirs.

Likewise, small firms have not received the attention they are believed to deserve given their importance in any economy. According to Pettit and Singer (1985 p.47), with few exceptions, research in the area of business finance has downplayed the effect of firm size on financial behavior. Rajan and Zingales (1995 p.1424) suggest that the study of the capital structure of the listed and largest companies may be of greatest interest to the financial community, but that the interests of academicians are broader. Petersen and Rajan (1994 p.18-9) provided the first attempt to study the determinants of financial leverage in small firms, but were very timid since this was not the main objective of their work. These authors, besides calling attention to the economic importance of small firms, assert that they are an ideal testing ground for the theory (p.4).

Tamari (1980) seems to be the first author to investigate the effects of size on financial leverage across countries with particular interest in identifying patterns distinguishing very small firms from their larger counterparts. Data presented by him (1980 p.24) for the U.S., the U.K., Japan, France and Israel, showed that there was more variation in financial leverage across countries than across size. However, Tamari (1980) documented some stylized facts about the financial behavior of small firms that were common to all countries studied. These stylized facts are that they rely more on short-term funds (p.24,25), borrow a greater share of their funds from trade and other non-bank creditors (p.25,26) and present a higher tendency to finance long-term assets with short-term funding (p.25) relative to big enterprises. Peterson and Shulman (1987) carried out a study that represents a second example of searching for patterns of financial leverage behavior in small firms across countries, with the difference that in this case many developing countries were included. Findings seemed to signalize that size, age and level of economic development were indeed important determinants of small firms' financial leverage in their small firms sample. Peterson and Shulman (1987 p.11) even came up with a life cycle model of capital structure, which they alleged was built upon results of prior empirical corporate studies as well as of their own work. This model predicts that as firms grow/age they go through stages of development, characterized by low percentage of debt/total assets during the early stages of existence and survival, maximum financial leverage during the intermediate stages of success and becoming established, and low debt/total assets ratios again during the late stage of maturity.

Although the above two works are very notable, their methodologies make it difficulty to accept their conclusions without any reservations. The one by Tamari (1980) used data in too aggregate a manner. That by Peterson and Shulman (1987) did not investigate financial leverage but separate components of it instead, as for example, usage of bank debt, supplier trade credit, loans from friends and relatives and personal capital. Both did not present significance levels for their findings. Besides, the work by Peterson and Shulman (1987) was a survey of opinions and some authors, like Aggarwal (1981 p.76), make strong reservations about its value as research evidence.

Small companies have always posed apparently insurmountable methodological difficulties to research. Storey and others (1987 p.2) emphatically pointed out the existence of a mismatch between the upsurge of public policy towards small firms and production of coherent or rigorous research in the area that may well subsist until today. Lack of availability of public data on very small firms would preclude the application of recognized techniques to empirical analysis. Thus, the corporate capital structure literature as opposed to the small business literature is understood to be a more appropriate background for the present research effort. This literature has been more able to work with published data on industrial structure. In addition, it has made use of more rigorous methodologies for analyzing data. Insights into capital structure behavior are more voluminous and more settled in this literature. In a way, exclusion of most of the very small firms literature is forced upon the present researchers. However, this by no way means that a very small firm will be treated in this work as a scaled-down version of a large firm. Nor does it mean that data obtained via opinion by the small entrepreneurs will not be used. After all, as argued by De Jong and Van Dijk (1998 p.21), data on some variables are only available from internal sources, even in the case of large firms. Summing up, the approach here will follow the guidelines proposed by Pettit and Singer (1985 p.47). For them, predicted differences between small and large firms should be developed from the same body of financial theory. Yet this theory must be general enough to allow for the possibility of small firms acting

differently or being affected differently from the types of firms that are ordinarily considered in corporation finance literature.

Part I will present the results of a search in the literature for hypothesized determinants of financial leverage that may make part of the unique reality of very small enterprises. Part II will deal with the methodological aspects of the research. Part III will present the general results of the research effort and their main implications for theory. Part IV will extend the analysis to own working capital for two reasons. First, this theme is of great importance for the very small firms. Second, consideration of the capital structure choice would not be complete for them without making a link with the destination of funds. Part V will address implications for small firms, policy making and small business support. Part VI will conclude.

I. REVIEW OF LITERATURE

A. BUSINESS RISK AND FINANCIAL LEVERAGE

A.1. RATIONALE

Out of the independent variables selected for inclusion in this study on small business financial structure, business risk seems to be by far the most discussed in the related literature both theoretically and empirically. Collins and Sekely (1983 p.45) state that several conclusions have found wide, if not total, acceptance and that one of these is that the level of financial leverage a firm can bear is a function of its business risk. Kale and others (1991 p.1693) assert that it is a consensus that business risk is one of the primary determinants of a firm's capital structure. Castanias (1983 p.1621) states that the tax shelter-bankruptcy cost theory of capital structure determines a firm's optimal leverage as a function of business risk, among few other variables.

As to the direction of the relationship, Kale and others (1991 p.1693) remind that the majority of finance books assert an inverse one. They go on to say that the basis for this argument is twofold. First, the existence of debt in the capital structure increases the probability of bankruptcy and, second, firms with more variable cash flows, that is, higher business risk, have a higher probability of bankruptcy for a given level of debt. Marsh (1982 p.122) refers to the same reasoning when talking about target debt level and probability of financial distress and Castanias (1983 p.1617) when discussing optimal leverage and bankruptcy costs. Kim and Sorensen (1986 p.136) observe that traditional finance textbook discussion invariably presents two things. These are the notion of debt capacity and the reasoning that firms with high degrees of business risk have less capacity to sustain high financial risk, and thus, use less debt. Perhaps, Baxter (1967 p.402) has this reasoning in mind when asserts that firms with risky income streams are less able to assume fixed charges in the form of debt interest. The meaning for inferior debt capacity or ability seems to be clarified by the words of Johnson (1997 p.54) that firms with more volatile earnings growth may experience more states where cash flows are too low for debt service. Toy and others (1974 p.878) and Ferri and Jones (1979 p.631) change the argumentation from the demand to the supply side of credit. The former authors argue that a firm with a high earnings rate variability, cetery paribus, would have a relatively lower debt ratio because of limits placed on it by lenders. The latter ones add to the reasoning that capital markets will also cause debt ratios to be lower, in face of higher volatility of a firm's income stream, via setting higher interest rates.

No matter how reasonable the arguments for an inverse relationship appear to be, there has been some dissenting argumentation. According to Kale and others (1991 p.1693), existing theoretical research does not provide an unambiguous answer as to whether an increase in a firm's business risk should lead it to lower the level of debt in its capital structure. These authors themselves develop a theoretical model that predicts a U-shaped relationship between business risk and optimal debt level. Talking about traditional and new positions held in relation to existing theory on corporate capital structure, Kim and Sorensen (1986 p.136) comment upon a position held by Myers (1977). According to them, Myers has assumed the new position that firms with large business risk may have a lower agency cost of debt, and thus optimally borrow more. According to MacKie-Mason (1990 p.1477), Jensen and Meckling (1976) suggest that firms with

large debt burdens may take excessive risks because the shareholders gain if the risks succeed but the creditors lose if they fail.

Of course, the Miller irrelevance hypothesis should not be forgotten, once, according to Castanias (1983 p.1617), it does not predict a relationship between business risk and optimal debt level in opposition to the tax shelter-bankruptcy cost hypothesis.

A.2. EMPIRICAL EVIDENCE

Castanias (1983 p.1617) notes that there have been numerous attempts to investigate empirically the implication of the tax shelter-bankruptcy cost theory that business risk inversely determines optimal debt level. In contrast, Kale and others (1991 p.1693) remind that empirical research does not provide an unambiguous answer to this question. Out of all research efforts already carried out, there are six pieces of them that, while documenting a decreasing relationship, produced results that seem to be relatively more straightforward. Carleton and Silberman (1977 p.818), who worked with aggregate values for industry, found earnings variability to be highly significant in three regression equations. A different measure of industry capital structure was used in each equation and the direction of the relationship was inverse in all regression equations. Bradley and others (1984 p.874), who appear to have been misquoted by Titman and Wessels (1988 p.6), found that their measure of firm volatility was significant and negatively related to firm leverage ratios. Friend and Lang (1988 p.277) claimed that consistent evidence was found in their research. They argued that, in their regression analysis, their measure of risk may suggest a negative impact on leverage, that is, a risky firm borrows less (p.275). Wedig and others (1988 p.34) concluded that hospitals having more volatile earnings history had lower debt-to-assets ratios. MacKie-Mason (1990 p.1484,1486) found a significant negative association between the probability to issue debt as opposed to equity and his two measures of operational risk in two different regression equation specifications. Interestingly, both measures entered the regression equations at the same time without troubling one another. Kim and others (1998 p.353), whose primary object of study was corporate liquidity rather than financial leverage, presented table results that showed a highly significant negative correlation coefficient between variability of operating cash flow and financial leverage.

Taub (1975 p.415) reported that his uncertainty variable was consistently negative but only attained significance when depreciation was excluded from earnings for the calculation of variability of past operating earnings. In addition, he did not work with a conventional measure of financial leverage, since his binary dependent variable assumed a value of zero when equity was issued and a value of one when bonds were issued (p.412). Flath and Knoeber (1980 p.113), who worked with industries as units of analysis, concluded that their findings added empirical support to theoretical assertions that failure costs do imply optimal capital structures. Their measure of operating risk had a negative coefficient sign in three out of four industry capital structure regressions, but significance did not appear to be high. Perhaps, this is the reason why Kale and others (1991 p.1694) cited them as concluding that there was no significant relationship between corporate leverage and business risk. Marsh (1982 p.137) concluded that companies with greater bankruptcy risk were more likely to issue equity. This author, who studied the same phenomenon as Taub (1975) and MacKie-Mason (1990), declared that experimented with four different measures or risk, although reporting only on the one that was not a conventional measure of business risk. Instead, his was a measure of total risk, thus being influenced by the level of gearing (p.132). Castanias (1983 p.1629) claimed that his empirical results were consistent with a tax shelter-bankruptcy cost model variant that posits that firms in lines of business that tend to have high failure rates also tend to have relatively less debt. While declaring to have worked with four commonly used measures of leverage, Castanias (1983) made use of a measure of total risk, namely, historical failure rates, instead of business risk. This characterizes his as a study on the more general relationship between probability of failure and leverage, rather than on that between business risk and leverage (p.1621). Roden and Lewellen (1995 p.84) found the same relationship but only when preferred stock was included as debt.

Some researchers have produced counter-evidence to the normative model of optimal capital structure. Toy and others (1974 p.882) found that earnings risk was positively signed in all five equations they regressed for the five countries they studied and highly significant in Norway, Japan and the United States. They added two contrasting observations. On the one hand, the surprising result might be attributed to reverse causality because of the use for two of the countries of earnings after interest in the calculation of volatility. On the other hand, however, the strongest effect was observed with relation to the United States

and Japan where EBIT was the earnings measure utilized (p.883). Kim and Sorensen (1986 p.131) concluded that high-operating-risk firms used more debt rather than less debt. They found significant positive coefficients for the two commonly used measures of operating risk with which they worked in their study (p.140). Kale and others (1991 p.1694) cited evidence from Long and Malitz (1985) that also supported an increasing relationship between business risk and financial leverage. Since details were not provided, no evaluation is possible in this case.

Two works deserve to be analyzed separately given their designs and results. Fischer and others (1989 p.19) studied observed debt ratio ranges of firms instead of debt ratios. Their measure of business risk was not a conventional one either (p.34). Their findings indicated that less risky firms had narrower debt ratio ranges (p.37). They argued that this result was in accordance with the theoretical model of relevant capital structure choice when considering a dynamic setting (p.19). However, little effort was put by them into explaining why according to intuition the opposite should be expected from predictions of that model. Kale and others (1991) provided peculiar results. Trying to improve upon works of previous researchers who produced evidence to support either a decreasing or an increasing relationship, they designed a piece of research to test the hypothesis of a U-shaped relationship (p.1706). Having found coefficient signs that were in accordance with the expected ones, these authors concluded that the results offered qualified support to their hypothesis, although two out of eight regression equation coefficients were not statistically significant (p.1707).

Finally, many researchers have found no relationship between business risk and financial leverage. Ferri and Jones (1979 p.642) reported using four measures of business risk and that, despite their apparent appropriateness, significant differences in risk measures were not found among debt ratio classes in the sample studied. Titman and Wessels (1988 p.11) reached the same conclusion by utilizing a not commonly used analytical technique. Kester (1986 p.13), Barton and others (1989 p.40), Mehran (1992 p.552) and John (1993 p.98), who made use of more conventional measures and analytical techniques, are four more examples of the kind. Baxter and Cragg (1970 p.233), whose object of study was new issues instead of conventional financial leverage, found no significant association between their measure of business risk and probability of the firm issuing bonds rather than common stock.

The work by Petersen and Rajan (1994) deserves separate mention since it is the only one to include enterprises of the sizes looked at in this research. These authors concluded that firms in industries with low earnings volatility tended to have a high debt-to-assets ratio (p.18). However, the regression coefficient of the variable measuring industry earnings volatility in their study was not significant. This has generally led other researchers to conclude for no relationship between business risk and financial leverage.

A.3. CRITICISMS OF EARLIER WORKS

Inferring from words by Bradley and others (1984 p.858 footnote 1), the general criticism is that authors reach different conclusions because they use different methodologies and samples. As to sampling, Castanias (1983 p.1620-1) criticized two earlier works for making use of data for very large firms in their tests. According to him, tests based on samples of very large firms are less likely to find a negative relationship between business risk and financial leverage. This would happen even being optimal capital structure decisions made in accordance with the tax shelter-bankruptcy cost theory. The author tried to prove his point first by developing in an appendix a theoretical supportive model and second by pointing out in one of the two works overlooked findings that accorded with his reasoning (p.1620 footnote 5). His rationale was based on the assumption that marginal default costs for large firms increase more slowly (p.1620-1).

It seems opportune to note here that some works investigating a posited relationship between financial leverage and industry grouping, which is seen as a proxy for business risk, have been criticized on the same grounds as above. As it will be seen in a later section, some researchers allege that a sample of only big enterprises biases the results toward denying the hypothesized relationship. Their argument, which has not been formalized in theoretical modeling, seems intuitively reasonable. Accordingly, some large, economically powerful firms may be able to avoid the discipline of the capital markets concerning financial structure that would be applied to smaller, less powerful firms.

A.4. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

A careful consideration of the various arguments reviewed in the section on rationale points in the direction of the existence of a relationship between business risk and financial leverage in the segment of very small firms. Naturally, it should not be expected that a sophisticated corporate optimal capital structure theory would apply without any adaptations to the case of very small firms, composed mainly of sole proprietorships and partnerships. As a rule, there is not a formal and explicit market value for their debt and equity. Likewise, income tax should not play an important role in their financial decisions, since tax evasion is notoriously quite widespread and very high among them mainly in developing countries like Brazil. Nevertheless, they are susceptible to bankruptcy as much as larger enterprises. Consequently, it may be expected that the traditional notion that firms with high business risk use less debt makes part of the reality of very small firms too. Higher business risk would then be linked to lower debt ratios because higher business risk means higher probability of failure. Moreover, the same link may be made because in the case of very small firms also it may be that lenders set higher interest rates or restrict borrowing amount in face of higher volatility of income. As to the various theoretical arguments that the relationship may be either direct, or U-shaped, or even non-existent, it may be said that they hardly apply to the case of very small firms. All of them are built upon the reality of corporations for which there is as a rule a formal and explicit market value for equity and debt. Two cases suffice to illustrate the point. The Miller irrelevance hypothesis uses personal arbitrage performed by stock investors to challenge the view that the corporate choice of level of debt influences the market value of the firm. The theory of agency cost of debt, in turn, is concerned with for example the debt cost implications of equityholders' suboptimal investment decisions. Such decisions would lead to decreases in the market values of both debt and equity, but may mean a gain to equityholders captured at the expense of debtholders. In both cases, stocks are bought and sold in the stock exchange, which is a reality very different from that of the very small firms.

Based on a careful inspection of the findings of empirical works as well it seems more adequate to expect a negative relationship between business risk and financial leverage in the segment of very small firms. First, 25% of the studies reviewed in the section on empirical evidence have produced results that are relatively more straightforward and that document a decreasing relationship either at the firm or industry level. Second, over 20% have produced evidence which, if cannot be counted as in favor, neither can it be counted as against. These are the cases of studies that have concluded that their findings were a proof of a negative relationship, but which have worked either with non-conventional measures of financial leverage or with measures of total risk instead of business risk. Third, two works, over 8%, have not addressed the problem that their measure of risk, namely, the coefficient of variation of EBIT, will indicate a high level of risk for an enterprise experiencing a steady and high rate of growth[1]. These two works have found a positive association. Fourth, the results of two more works, another over 8%, should not cast any doubt on the establishing of an expected negative relationship. One of them has found a positive association but worked with debt ratio ranges instead of debt ratios. The other one has found a U-shaped association but this is too isolated a result. Fifth, 7 pieces of research, just over 29%, have concluded that have found no association, but they too may be flawed by methodological misprocedures. Six of them are posterior to the criticism that the use of data for only very large firms may bias the results towards finding no relationship, but can, as much as the criticized one, be susceptible to the same criticism. In fact, Barton and others (1989 p.42) admitted that, given their use of data for only large firms, their conclusions should not be generalized to smaller enterprises. Last, the two works that are left, the remaining over 8%, also call for qualifying. The one by Petersen and Rajan (1994) was the only study dealing with enterprises of the sizes looked at by this research. It is very unfortunate that it has failed to find a significant association, but, on the other hand, it has not worked with data for the level of the firm. The one by Long and Malitz (1985) has not been directly reviewed. So, the possibility that like others it may be flawed by the methodological mistake of assigning a high level of risk to an enterprise experiencing a steady and high rate of growth has not been checked.

B. SIZE AND FINANCIAL LEVERAGE

B.1. RATIONALE

Size has been viewed as a proxy for business risk and so has been believed to be influential with

[1]As will be seen in the section on research methodology, this is a real problem and is purposely avoided in this research through the choices thereat made.

respect to financial structure. According to Remmers and others (1974 p.30), Castanias (1983 p.1628) and Titman and Wessels (1988 p.6), the reasoning is that larger firms are more diversified and hence have lower variance of earnings, making them able to tolerate higher debt ratios. According to Taub (1975 p.412), they are able to tolerate higher debt ratios also because firms with larger assets have greater resources to fall back on in case of a variation in earnings that makes meeting interest payments difficult. Castanias (1983 p.1628) argues that smaller enterprises may present lower debt ratios because they may be rationed by creditors, because of greater information asymmetries and/or managerial discretion, making them riskier from the point of view of lenders. As to information asymmetries, Johnson (1997 p.54) reminds that Fama's (1985) arguments about differing amounts of information supplied by large and small firms suggest that monitoring costs would decrease and lender informedness increase with firm size. Last, Titman and Wessels (1988 p.5-6) suggest that bigger enterprises may have higher debt ratios because direct bankruptcy costs would constitute a larger proportion of a firm's value as that value decreases. Castanias (1983 p.1628 footnote) expresses this belief differently by reasoning that if the fixed portion of default costs tend to be large, then marginal default costs per dollar of debt may be lower and increase more slowly for larger firms.

For some authors, such as Ferri and Jones (1979 p.632) and Kim and Sorensen (1986 p.135-6), some facts about larger firms may be taken as evidence that these enterprises are less risky. These facts are that they enjoy easier access to the capital markets, receive higher credit ratings for their debt issues and pay lower interest rates on borrowed funds. Related to this belief, Roden and Lewellen (1995 p.77) claim that larger firms are likely to be treated more leniently and with greater flexibility by their creditors because of the large size of the individual loans involved.

Although the foregoing seems completely reasonable, some authors refer to arguments that reverse the expected direction of the relationship between size and financial leverage. Titman and Wessels (1988 p.6) think that the fact that small firms pay much more than large firms to issue new equity would suggest that small firms may be more leveraged than large firms. Gupta (1969 p.526) shares the view that smaller-sized corporations face a financial constraint on the availability of equity capital and adds an additional causal factor of such a constraint, that is, the smaller-sized corporations' earnings volatility. Rajan and Zingales (1995 p.1451) reason that, as size may also be a proxy for the information outside investors have, it should increase their preference for equity relative to debt.

Peterson and Shulman (1987 p.20) propose a model that aims at integrating most of the contradictory views above reviewed. Their life cycle model of capital structure, which they allege is built upon results of prior empirical studies as well as of their own work, predicts that as firms grow/age they go through stages of development. Such a life cycle model is characterized by very little use of debt financing at the very early stages, increasing use of debt financing at the intermediate stages and decreasing use of debt financing at the advanced stages. Personal and private equities take on a primordial financing role at the stages of existence and survival. This is so since entrepreneurs and lenders face an insurmountable agency and asymmetric information problem at these times and consequently borrowing costs are very high or credit is not made available. From the end of the stage of survival or start of the stage of success, the firm begins to establish a financial profit/loss record and credit history. In addition, the entrepreneur becomes increasingly proficient at communicating his vision of the opportunity his is pursuing. Consequently, increasingly financing options become available at presumably increasingly accessible direct and indirect cost terms. From the end of the stage of establishment or start of the stage of maturity, equity, now public, begins to retake its primordial role. This is so because access to it is made possible by greater operations, higher liquidity reserves and lower default costs.

B.2. EMPIRICAL EVIDENCE

Empirical works on the relationship between size and financial leverage are quite varying with respect to conclusions. Taub (1975 p.415) and Marsh (1982 p.137) reached the conclusion that the size of the firm had a positive impact on its "desired" debt-equity ratio, since smaller companies were more likely to issue equity. Marsh reported experimenting with three measures of size, which gave virtually identical results (p.132 footnote 37). As already noted, these authors worked with a non-conventional measure of financial leverage. Baxter and Cragg (1970 p.233) came across with the finding that the larger the company, the more likely it was to issue bonds rather than preferred stock or common stock. This study was very similar to those of Taub (1975) and Marsh (1982). MacKie-Mason (1990 p.1485) presented table

results that seemed to indicate that size was significantly positively associated with the probability to issue debt as opposed to equity in his work too. Friend and Lang (1988 p.278), who worked with two groups of firms, found a significant positive relationship in the group formed by relatively smaller enterprises. Scott and Martin (1975 p.70), Barton and others (1989 p.40) and Barclay and Smith (1996 p.16) found size to be positively associated with debt levels by using conventional measures of both dependent and independent variables. Rajan and Zingales (1995 p.1453) found size significantly positively associated with book leverage in four and with market leverage in three out of seven countries in their international study on capital structure. Kim and others (1998 p.353), whose primary object of study was corporate liquidity rather than financial leverage, presented table results that showed a highly significant positive correlation coefficient between size and financial leverage. Filardo (1980 p.78), working with interest payments as a percentage of sales, which is a non-conventional measure of financial leverage, and with two classes of firm size, found that such percentage was significantly higher for the larger enterprises class. Last, Marsh cited evidence from Gordon (1962) that also supported the posited positive association between gearing and size. Since details were not provided, no evaluation is possible in this case.

The work by Petersen and Rajan (1994) deserves again separate mention since it is the only one to include enterprises of the sizes looked at in this research. These authors found their measure of size highly significantly correlated with their measure of financial leverage in a direct manner (p.18-9). They used conventional ways of measuring these two variables.

Ferri and Jones (1979 p.640) concluded that size could account for differences in financial leverage, but that, nonetheless, the relationship was not straightforward. They found that small firms clustered in classes of high and low leverage whereas the larger ones seemed to concentrate in the classes of intermediate leverage (p.642). This is a very strange finding since two values of the dependent variable would be associated with just only one value of the independent variable. The authors themselves recognized this when they asserted that at the very least this fact precluded the monotonically association between size and leverage previously posited (p.642).

Gupta (1969 p.526) found the total debt to total asset ratio negatively related to size of the corporation. Fischer and others (1989 p.37) identified a negative relationship between size and debt ratio range. They argue that this result is in accordance with the theoretical model of relevant capital structure choice (p.37). The dependent variable studied by them was not financial leverage but a related concept. Rajan and Zingales (1995 p.1453) found size significantly negatively associated with book leverage and with market leverage in one out of seven countries in their international study on capital structure.

The number of researchers who have not found a relationship between size and financial leverage is almost as high as the number of those who have found. Remmers and others (1974 p.30,32), Aggarwal (1981 p.78,80), Castanias (1983 p.1629 footnote), Collins and Sekely (1983 p.48), Kim and Sorensen (1988 p.131,140), Titman and Wessels (1988), Mehran (1992 p.552) and Roden and Lewellen (1995 p.83) all concluded that size should not be a determinant of financial leverage. Rajan and Zingales (1995 p.1453) found no association between size and book value leverage in two and between size and market value leverage in three out of seven countries in their international study on capital structure. Kester (1986 p.13) and John (1993 p.98) presented table results in which the coefficients for the size measure were not statistically significant. All these authors worked with conventional measures of both financial leverage and firm size. Some of them worked with more than one measure for either the dependent or the independent or even both variables. Additionally, Kale and others (1991 p.1707) arrived at the conclusion that their regression results provided weak evidence in support of a size effect. In fact, their results were so weak that they would be classified by other authors as no findings at all. Agrawal and Nagarajan (1990 p.1326) concluded that all-equity firms tended to be relatively small. However, they reported that differences in size measures between the two classes of financial leverage considered were not statistically significant. Theirs was not a conventional measure of financial leverage, though.

It should be noted here that Titman and Wessels (1988 p.13) in fact identified a positive and highly significant relationship between size and both long-term debt divided by book value of equity and short-term debt over book value of equity. They, however, dismissed this finding mainly because the same was not found for the measure of long-term debt scaled by market value of equity. According to these authors, significant coefficient estimates for either, but not for both, the market value and book value debt level measures are consistent with debt ratios being chosen randomly (p.15). They also argued that, rather than

indicating a size effect, their evidence suggested that many firms were guided by the market value of their equity when selecting their long-term debt levels. They reasoned so because size in their study was highly positively associated with market value and market value determines borrowing capacity (p.14). Alderson and Betker (1995 p. 56) presented table results in which the coefficient for the size measure was statistically significant for financial leverage being defined as total liabilities over total assets. However, it was statistically non-significant for financial leverage being defined as long-term debt over total assets. In both cases, the signs of the coefficients were positive.

B.3. CRITICISMS OF EARLIER WORKS

The reviewed literature on firm size and financial leverage contains no specific criticisms directed from authors to earlier works. However, Remmers and others (1974 p.30) added a word of caution with respect to their own conclusions. They reminded that even the small firms in their sample could be classified as relatively large compared to very small, family-owned enterprises. Therefore, according to them, when the finance literature suggests that size is a determinant of debt ratios, it may still be true if the range of size includes the very smallest and largest firms. Titman and Wessels (1988, p.6 and 8) expressed the same position as the above authors in two ways. First, when they acknowledged a bias towards very large enterprises in their study. Second, when they stated that their logarithmic transformation of sales reflected their view that the effect of size, if existent, would affect mainly the very small firms.

B.4. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

As far as the theoretical arguments reviewed in the subsection on rationale are concerned, it seems inevitable to expect the existence of an association between financial leverage and firm size in a very small firms sample. As seen, arguments that suggest this link are numerous and backed by many theorists. As to the direction of the association, it appears plausible to accept that the life cycle model of capital structure is a promising theoretical attempt to integrate the conflicting arguments for a direct with the ones for an inverse relationship. Accordingly, a direct causal link is expected for the sample to be examined in this study. Even if the life cycle model were ignored, this would be the choice, since arguments in the literature in favor of an inverse causal link do not weigh much. These arguments are neither numerous nor backed by many authors.

To set expectations from previous empirical evidence is not a straightforward task, since the corresponding subsection is, unlike that on rationale, characterized by much divergence. To make things still more difficult, the subsection on criticisms reveals shortage of help for the analysis of the various findings. In view of these difficulties, it is necessary to take resort also here to the theoretical life cycle model of capital structure. Only in this manner does it seem possible to conciliate the literature contradictory findings in a way to conform them to a logical reasoning and conclude, although precariously, as to what to expect from a very small firms sample.

Three reviewed works might be seen as potential evidence in favor of a negative relationship between size and financial leverage. Besides being only three, they may have their results questioned. Gupta (1969 p.518) reported working with firm-size categories ranging from total assets of less than $ 50,000 to total assets of $ 250 million and more. This is a range of size consistent with the increasing-decreasing relationship pattern postulated by the life cycle model of capital structure for size and financial leverage. So, it remains an open question whether or not the Gupta's inverse association finding would become less challenging to the traditional view if the author had tried to fit a non-linear equation to his data. Fischer and others (1989) worked with a related instead of the conventional concept of financial leverage and this may be an explanation for their finding being apparently contrary to the traditional view. Besides, they themselves alleged that their finding was in accordance with the theoretical model of relevant capital structure choice. Therefore, their finding may be in agreement with the traditional view if narrow debt ratio ranges are associated to high debt ratios. It may also be that Fischer and others' finding conforms to the life cycle model of capital structure, since the authors reported making use of data from COMPUSTAT tapes and COMPUSTAT firms are understood to be very large. Last, Rajan and Zingales (1995 p.1424) criticized themselves for making use of a sample of only very large enterprises in their international study.

At a first glance, the relatively expressive number of works that have found no association between financial leverage and firm size seems to pose a big problem in view of the objective of this subsection.

However, the self-criticism of the early work by Remmers and others (1974) may also apply to subsequent research efforts. This was that, because they dealt with only very big enterprises, their size variable possibly did not vary sufficiently for its effect to be captured. In fact, a careful examination of the other works reveals that nearly all of them have reported using either the same source as that of Remmers and others or other sources with very similar firm size compositions. Some of the authors have acknowledged that their samples were composed of only large firms. Titman and Wessels (1988), for instance, acknowledged that the source of data and their inclusion requirements might have biased their sample toward relatively large firms (p.8). In addition, Titman and Wessels (1988), as already seen, dismissed their finding that size was significantly and positively associated with financial leverage measured by book value. However, they did so for reasons that they overlooked when the case involved profitability and financial leverage measured by market value.

Not all the works that have found firm size positively associated with financial leverage are free from qualification either. Four out of fourteen of them cannot be taken as direct evidence since they have made use of non-conventional measures of financial leverage. They are the ones by Baxter and Cragg (1970), Taub (1975), Marsh (1982) and MacKie-Mason (1990). Another one has reached strange results. This is the one by Ferri and Jones (1979). Finally, the one by Alderson and Betker (1995) found a significant association for a more inclusive but not for a less inclusive, although conventional, measure of financial leverage.

On balancing all the above considerations, it appears reasonable to expect that firm size be related to financial leverage in a direct manner, at least in a very small firms sample. The weight of the theoretical arguments of the traditional view and the apparent weaknesses of the works that have challenged it make it wiser not to speculate in any other direction. After all, even the authors who have found no support for the posited association between size and financial leverage believe that it may be proved true if very small firms are included in the sample.

C. ASSET COMPOSITION AND FINANCIAL LEVERAGE

C.1. RATIONALE

There are many conflicting views in the financial literature over the role that asset composition can play in determining financial leverage. There are some arguments put forward to justify an expected negative relationship between the ratio of fixed to total assets and financial leverage. Ferri and Jones (1979 p.643) argue that financial theory would suggest a linear and negative form of relationship. Their reasoning is that, since the use of fixed assets can magnify the variability in the firm's future income, the firm's proportion of fixed assets should be negatively related to the percentage of debt in its financial structure (p.632). These authors simplify the concept of operating leverage since they say that it can be defined as the use of fixed costs in the firm's production scheme and that it is generally associated with the employment of fixed assets (p.632). Baker (1973 p.504) expresses the same belief, although via a different reasoning. He says that firms with relatively high cost fixity may tend to choose financial structures that are relatively less risky, that is, high values of equity/assets. His concept of cost fixity seems to be equivalent to Ferri and Jones' operating leverage. According to him, cost fixity is inflexibility of total cost in response to output changes and tends to be higher the higher fixed costs are in relation to total costs of production. Kim and Sorensen (1986 p.137) assert that the need for the tax shield from the use of debt is reduced by higher levels of depreciation, which they define as depreciation expense as percent of total assets. Depreciation expense as percent of total assets should be in inferential terms virtually the same as the ratio of fixed to total assets. Consequently, these authors expect the same direction of relationship between the fixed assets ratio and financial leverage as Ferri and Jones do, being the reasoning the only thing to change. According to Titman and Wessels (1988 p.3), some reasons may lead firms with less collateralizable assets to choose higher debt levels to limit their managers' consumption of perquisites. Since fixed assets are generally seen as the most collateralizable type of assets, this is one more reason to expect a negative relationship between the fixed assets ratio and financial leverage.

No matter how sensible the foregoing may sound, the most common argument in the literature favors an expected positive relationship between the ratio of fixed to total assets and financial leverage and bears on the collateral value of assets. Bradley and others (1988 p.874) believe that firms that invest heavily in tangible assets tend to have higher financial leverage since they can borrow at lower interest rates if their

debt is secured with such assets. Friend and Lang (1978 p.277) think that the fixed asset ratio has a positive impact on debt ratios because of the collateral value of these assets that has an obvious link to the debt capacity of the firm. Wedig and others (1988 p.3) believe that debt may be more readily used if there are durable assets to collateralize it. Titman and Wessels (1988 p.3) summarize a number of theories that go into details to explain why these beliefs may make sense. For example, one of these theories suggests that, by selling secured debt, firms increase the value of their equity by expropriating wealth from their existing unsecured creditors. Another one demonstrates that there may be costs associated with issuing securities about which the firm's managers have better information than outside shareholders and that issuing debt secured by property with known values avoids these costs. A third example is the theory that says that if the debt can be collateralized, the borrower is restricted to use the funds for a specified project. Since no such guarantee can be used for projects that cannot be collateralized, creditors may require more favorable terms, which in turn may lead the borrowing firm to use equity rather than debt financing. MacKie-Mason (1990 p. 1477) suggests that a moral hazard effect may produce the direct relation between asset composition and debt levels. Moral hazard is possible when managers make investment decisions after the issuing of the debt. Thus, debt should be relatively cheaper when firm value depends heavily on committed investments already in place. Rajan and Zingales (1995 p.1451) remind that tangible assets should also retain more value in liquidation. This could be one more reason to expect a positive relationship between asset composition and financial leverage.

Toy and others (1974 p.879) were very sorry for not being able to quantify technology and get adequate published data to measure liquidity of assets in their study on financial leverage in different countries. These authors quoted Keenan (1973) who suggested these variables as determinants of debt ratios, although nothing was said about the direction of the relationship. However, it is more important to note that Keenan's suggestion is one more belief that supports the hypothesized relationship between asset composition and financial leverage, since it appears intuitive to link the asset composition variable to both technology and asset liquidity.

C.2. EMPIRICAL EVIDENCE

Again, evidence is conflicting, although apparently stronger in one direction. Ferri and Jones (1979 p.641-3), who worked with conventional measures of both variables, found that firms with a high proportion of fixed to total assets were concentrated in the low leverage classes in their study. Kim and Sorensen (1986 p.140) found a significant and negative coefficient between depreciation expense as a percent of total assets and financial leverage. Marsh (1982 p.126 footnote 19) cited evidence from Bray (1967) and Schmidt (1976), who found a negative correlation between total debt and the proportion of fixed assets. It is understood here that the author means total debt ratio when he writes total debt. Soares and Procianoy (2000 p.13) found a significant and negative correlation between the ratio of fixed to total assets and the total debt ratio in a sample of 204 listed companies in Brazil for the period 1991 to 1997.

Baker (1973 p.506), who dealt with industry as unit of analysis, concluded that cost fixity had a modest influence on financial leverage, larger amounts of cost fixity leading to lower degrees of financial leverage. Unfortunately, it seems, from the numbers provided by the author himself, that such association was not statistically significant at the conventional 5% level.

Evidence for a direct relationship seems to be a little more plentiful. Marsh (1982 p.137) concluded that firms with few fixed assets were more likely to issue equity. As already observed in another section, this researcher worked with a non-conventional measure of financial leverage. MacKie-Mason (1990 p.1486), who carried out a work very similar to that of Marsh, concluded that a high fraction of plant and equipment (tangible assets) in the asset base made the debt choice more likely. Bradley and others (1984 p.874) arrived at the conclusion that their measure of non-debt tax shield worked in fact as a measure of asset composition, since they found a significant positive coefficient with financial leverage. Their measure was the sum of annual depreciation charges and investment tax credits divided by the sum of annual earnings before depreciation, interest and taxes (p.871). Wedig and others (1988 p.37), who dealt with data on hospitals, and Friend and Lang (1988 p.275 and 277) concluded that higher fractions of total assets in tangible form were associated with higher financial leverage. Rajan and Zingales (1995 p.1453) found tangibility significantly positively associated with book leverage in six and with market leverage in five out of seven countries in their international study on capital structure. For these scholars, tangibility is the ratio of fixed assets to the book value of total assets. Shyam-Sunder and Myers (1999 p. 241) presented table results that

indicated a tendency for firms with more fixed assets to borrow more. Last, Marsh (1982 p.126 footnote 19) quoted Chudson (1945) as being perhaps surprisingly the only author until 1982 to find a positive correlation between the fixed assets ratio and financial leverage.

Studies finding no relationship between asset structure and financial leverage are relatively more recent. The works by Titman and Wessels (1988 p.2, 11, 17), by Mehran (1992 p.552) and by John (1993 p.98) are examples of the like. However, these studies are not directly comparable to the others, since their authors worked with inventory plus gross plant and equipment as a percentage of total assets as their indicator of collateral value of assets. Studies do finding a relationship work with only plant and equipment in the numerator as a rule. Rajan and Zingales (1995 p.1453) found tangibility not associated with book leverage in one and with market leverage in two out of seven countries in their international study on capital structure. Their concept of tangibility corresponds to the ratio of fixed assets to the book value of total assets.

C.3. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

Although acknowledged that the most common belief in the literature is that the fixed assets ratio and financial leverage are positively associated, there are strong reasons to believe the contrary when only very small firms are under consideration. It is not understood that these reasons have something to do with the ones suggested by Kim and Sorensen (1986) and by Titman and Wessels (1988) and previously reviewed. As already stated, income tax should not play an important role in the very small firms' financial decisions and thus it should not make much sense to speak of a tax shield effect in their case. Likewise, it should not make much sense either to speak of managers' consumption of perquisites when it is known that very small firms are generally run by their owners. The reasons do have much to do with the phenomenon of operating leverage referred to by Ferry and Jones (1979) and by Baker (1973). It is possible that very small firms experience much more variability of sales than corporate enterprises do for many reasons. Very small firms operate in environments or sectors where there is much more competition (because there are much fewer barriers to entry), products are more subject to fashion or the ever changing tastes and preferences of the consumers (because the gains that would accrue to them from standardization and automation of production do not in their view surpass the value of individualized catering), and differential advantage is more difficult to maintain (because imitation is easier)[2]. Consequently, it will be in the segment of very small firms that, for any given level of operating leverage, its effect will be most felt, since the resulting operationally levered variability increases as sales variability increases. In addition, larger enterprises have complete access to a powerful marketing apparatus in order to stabilize sales and indirectly neutralize the magnifying power of operating leverage[3]. In view of all these considerations, it is very plausible to anticipate a decreasing impact of the fixed assets ratio on the financial leverage of very small firms. The first part of the causal sequence would follow from the assumption implicit in Ferri and Jones (1979) and in Baker (1973). Accordingly, the highest the proportion of fixed assets, the highest the degree of operating leverage, and, in turn, the highest the degree of business risk (if there is variation in sales). The second part would follow from the reasoning as seen in the section on business risk. Accordingly, the highest the degree of business risk, the highest the probability of bankruptcy, and, in turn, the lowest the degree of financial leverage.

[2] White (1982) used similar arguments to set up hypotheses concerning the determinants of the relative importance of small businesses. In addition, by empirically testing these hypotheses, he provided some indirect evidence that the environments where small firms are prevalent are more uncertain. Direct testing by means of analysis of industry sales variability over time resulted in non-significant regression coefficients. However, it seems that cross-sectional intra-industry firm sales variability is also so important an aspect of industry uncertainty not to have been analyzed and so confirmation of the indirect evidence might reside in it. On the other hand, Whittington (1980) and Tamari (1980 p.32) found that inter-company dispersion of profitability tended to decline with firm size. This higher dispersion of small firm profitability could be traced to their higher sales variability based on two considerations. First, bigger enterprises present a higher degree of operational leverage, because they are more capital-intensive. Second, sales variability and operational leverage are considered the two most important determinants of variability of profitability. Thus, by deduction, it must be the higher sales variability of small firms the factor causing their profitability to show higher dispersion.

[3] White (1982) seemed to have accepted his finding of a really very high correlation between capital intensity and advertising in a sub-sample of industries where smaller firms are more prevalent as evidence of this kind of protective behavior. Baker (1973 p.505) quoted Sherman and Tollison (1971) who point it out that high levels of advertising can result from high levels of cost fixity.

There are arguments that can be used to contradict also directly the main theoretical argument favoring an expected positive relationship between the fixed assets ratio and financial leverage. For example, it may be argued that, although a small firm may have a higher fraction of fixed assets, it is possible that this means no higher capacity to collateralize debt. Very small firms are urged to start acquiring plant and machinery well before they are able to begin buying property and, according to Binks (1979), plant and machinery are often considered unacceptable as viable security. Hence, it does not seem to make much sense to speak of a positive effect of the fixed assets ratio upon financial leverage in the segment of very small firms. Neither does it appear to make much sense the theories summarized by Titman and Wessels (1988) when a very small firms sample is under consideration. Two out of three of these theories assume the existence of a formal and explicit market value for equity and debt, which does not make part of the reality of very small firms.

Previous empirical evidence, or otherwise, poses here the same kind of difficulties faced when setting expectations for the relationship between firm size and financial leverage. No help at all from criticisms of earlier works is available this time. Besides, no theoretical model has in this case been forwarded to conciliate past contradictory findings.

The weight of previous empirical evidence apparently supportive of the arguments that favor an expected positive relationship becomes less so when the results of the studies reviewed are subjected to qualifying. The works by Marsh (1982) and by Bradley and others (1984) cannot be taken as direct evidence in view of the fact that they used non-conventional measures of respectively financial leverage and asset composition. Shyam-Sunder and Myers (1999 p.227) acknowledged that their study might be biased toward relatively large firms with conservative debt ratios, which is a criticism that applies to many other studies making use of Compustat data. This leaves roughly three empirical studies with findings that support a postulated positive relationship and three with findings that support an expected negative association between the fixed assets ratio and financial leverage.

The works by Titman and Wessels (1988), by Mehran (1992) and by John (1993) should cast no doubt on the establishing of an expectation of a relationship between asset composition and financial leverage. Besides being the only three not to find any association between these variables, they are also the only three to add inventory to fixed assets in their measure of asset composition. The fact that they added inventory to fixed assets means that they worked with a concept different from that investigated in this study.

After all the above considerations, it seems that, if empirical evidence cannot counteract what theoretical arguments indicate, then the expectation for a negative association between asset composition and financial leverage should be maintained. The uniqueness of the very small firms' nature and the fact that empirical evidence based upon data on only large firms is not convincingly indicative of any specific direction seem to allow this conclusion.

D. PROFITABILITY AND FINANCIAL LEVERAGE

D.1. RATIONALE

As far as profitability is concerned, the most common expectation in the financial structure literature is for a negative relationship with financial leverage. Toy and others (1974 p.877), Marsh (1982 p.126 footnote 22), Friend and Lang (1988 p.277), Titman and Wessels (1988 p.6) and Barton and others (1989 p.40) all say that in different words. According to them, a firm with a high profit rate, ceteris paribus, would maintain a relatively lower debt ratio because of its ability to finance itself from internally generated funds. The preference for raising capital first from retained earnings may be due, according to Titman and Wessels (1988 p.6), to the costs of issuing new equity or debt that arise because of asymmetric information or transaction costs. Marsh (1982 p.126 footnote 22) raises the possibility that the impact may be due to the tendency of firms to issue new equity immediately after periods of abnormally good performance. Hall and Weiss (1967 p.328) assert that relatively profitable firms take some of their exceptional returns in the form of reduced risk, through retaining earnings, and, therefore, show lower debt to assets ratios. Rajan and Zingales (1995 p.1451) cite Jensen (1986) who predicts that, if the market for corporate control is

ineffective, managers of profitable firms prefer to avoid the disciplinary role of debt. This preference would lead to a negative correlation between profitability and debt. Gupta (1969 p.522) speaks of a theory that extends the first belief above mentioned from the firm level to the industry level. Accordingly, profitable industries, because of the greater availability of internally generated funds related to their high profitability, tend to have lower debt in their financial structure. Last, Gale (1972 p.417-8) interprets leverage as representing the degree of risk or otherwise in the industries in which the firm competes and hypothesizes that leverage should then be negatively related to profitability. This author himself acknowledges that his reasoning is somewhat at odds with previous discussions and theory, though. According to him, low debt to total capital ratios would reflect high industry risk because of two aspects. First, the corresponding capital structures would be the result of higher investment on the part of entrepreneurs, who, differently from lenders, place a lower value on security relative to rewards. Second, high-risk industries are, at least theoretically, associated with higher profitability.

Despite the relatively expressive number of authors who reason favorable to a postulated negative association, some researchers remind that the weight of high-level theory is for a positive association between profitability and financial leverage. Thus, Barton and others (1989 p.42-3) assert that pure economic reasoning suggests that firm profitability should be positively correlated with debt. Carleton and Silberman (1977 p.811) affirm that intuition and received theory dictate that financial leverage, measured as the book value of debt/capital or debt/equity, and mean rates of return on equity should vary directly among firms and industries. Gale (1972 p.418) reminds that the conventional (non Miller-Modigliani) financial theory would suggest that if the level of business risk is held constant, the rate of return on equity would be larger, the larger the ratio of debt to capital. Arditti (1967 p.22) states that the greater the firm's leverage the higher the variability of the earnings available for distribution to shareholders and that, thus, the risk of debt is that it increases the variance of returns. He goes further to say that, as the firm's debt/equity ratio can be taken as a measure of this risk, to the extent it increases, the risk borne by the shareholders increases and the expected utility of the investment decreases. The only way in which the investment can retain its appeal to the shareholders is for the expected utility of the investment to increase or at least remain constant. The author completes his reasoning by saying that for this to occur, however, the expected or required return from the investment must increase. Implications of the high level financial theory put aside, Gale (1972 p.418) reports that Stigler (1963) proposes a hypothesis, already referred to in the previous paragraph, that is the opposite to his. For Stigler, positive risk aversion of lenders would lead one to expect the realized rate of return on all capital to be the larger, the higher the ratio of debt to capital. It seems that Stigler's reasoning is that lenders, demanding higher compensation for all levels of risk, would tend to invest on the most profitable industries and firms, resulting in a more levered financial structure of the corresponding industries and firms. Last, Rajan and Zingales (1995 p.1451) cite Jensen (1986) who predicts a positive relationship if the market for corporate control is effective and forces firms to commit to paying out cash by levering up.

Roden and Lewellen (1995 p.77) analyzed leveraged buyout transactions with a view to studying the determinants of corporate capital structure decisions. They reason that the higher the return on assets exhibited by the target firm, the larger the proportion of debt in the buyout financing packaging. According to them, tax-deductibility of interest payments has been pointed out as one of the major potential sources of valuation gains from a leveraged buyout. Because of this, it may be expected the buyout groups involved to seek to offset the taxes that would otherwise be paid on high profits by an especially heavy emphasis on debt-related tax shields. Their rationale is pertinent here because, as the authors themselves say, and found to happen in their empirical study, the mix of financing in the buyout package becomes essentially the firm's post-buyout capital structure (p.77 footnote).

D.2. EMPIRICAL EVIDENCE

Empirical evidence seems to follow a pattern coherent with the distribution of authors among the possible alternative expectations referred to in the previous subsection. Accordingly, Toy and others (1974 p.882), Sullivan (1974 p.1409-10), Collins and Sekely (1983 p.48-9), Kester (1986 p.13), Friend and Lang (1988 p.275), Barton and others (1989 p.42), Shyam-Sunder and Myers (1999 p.241), Arditti (1967 p.36), Hall and Weiss (1967 p.328) and Gale (1972 p.423), who all used conventional measures, found profitability strongly inversely related to financial leverage. It seems worth noting that Arditti, Hall and Weiss and Gale's object of study was not the determinants of financial leverage but those of profitability. Carleton and Silberman (1977 p.819), who worked with industries, came across with the same finding.

Marsh (1982 p.136), who worked with a non-conventional measure of financial leverage, as already seen, also found the significant negative association. Titman and Wessels (1988 p.2,14), who identified a highly significant inverse association when working with market values and none when dealing with book values, concluded, abandoning without justification the approach taken when analyzing growth and size, that they found some support for the proposition that profitable firms have relatively less debt. Petersen and Rajan (1994 p.18), who are the only researchers dealing with enterprises of the sizes looked at in this work, found the same significant negative relationship for firms too. Rajan and Zingales (1995 p.1453) found profitability significantly negatively associated with book leverage in three and with market leverage in four out of seven countries in their international study on capital structure. Last, there is literature not directly reviewed by this work. Marsh (1982 p.126 footnote 22) cited evidence from Bray (1967), Gordon (1962) and Schmidt (1976) concurring with the common finding of a negative association.

Taub (1975 p.415), however, found significant positive coefficients for four measures of profitability. It should be reminded that this author worked with the same non-conventional measure of financial leverage employed by Marsh, namely, equity or debt new issues. Petersen and Rajan (1994 p.18), already quoted above, identified the same association but for industries. Baker (1973 p.506), who worked with a simultaneous equations model, and Nerlove (1968 p.313)[4] also found the same type of association for industries. It seems worth noting that Baker and Nerlove's object of study was not the determinants of financial leverage but those of profitability. Roden and Lewellen (1995 p.83) found a significant positive association between profitability and total debt as a percentage of the total buyout-financing package in their study on leveraged buyouts.

Gupta (1969 p.522) concluded, with respect to industries, that no significant association between profitability, as measured by either the productivity of assets or rate of return on net worth, and total debt to total assets was observed in his study. Aggarwal (1981 p.86) arrived at the conclusion that profitability did not seem to be a significant determinant of capital structure in his international study. Rajan and Zingales (1995 p.1453) found profitability not associated with book leverage in four and with market leverage in three out of seven countries in their international study on capital structure.

D.3. CRITICISMS OF EARLIER WORKS

Perhaps owing to the weight of the theoretical and empirical literatures just reviewed that broadly supports one of the views, there has not been much argumentation over the role profitability plays in determining financial leverage. Carleton and Silberman (1977) represent the almost single attempt to provide a rationale to conciliate what the majority of empirical studies find with what, according to them, financial theory dictates (p.811-12). They first argue that straightforward finance-theoretic considerations suggest that an industry's average book rate of return, expressed as the ratio of earnings before interest and taxes to total invested capital, is an increasing function of the variability of that return. They second assert that similar considerations dictate that the higher the variability is in rate of return on invested capital, ceteris paribus, the lower will be the degree of financial leverage adopted. They third affirm that the observed inverse relationship between rate of return and financial leverage merely reflects the joint implication of mean rate of return being an increasing function and financial leverage a decreasing function of earnings variability. They fourth and last argue that this anomalous outcome should be reversed if a simultaneous-equation model analysis is applied.

Marsh (1982 p.126 footnote 22) seems to be the only author in the literature being reviewed to pay

[4] There seems to be a problem with this author's article. On the one hand, he concluded that in his research sample financial leverage was positively associated with rate of return. For him, this would be in accordance to expectation, since a highly levered common stock is a more risky investment than a stock in a firm with little long-term debt or preferred stock (p.313). On the other hand, however, his leverage variable, that is, the total of long-term debt, preferred stock, and common equity divided into equity (p.320), has a negative sign in all the regression results shown in two tables in his article (p.324,326-7). Although the author called this leverage measure reciprocal of leverage, it seems in fact to be the reciprocal of the inverse of leverage, thus leverage itself. Carleton and Silberman (1977 p.811) quoted Nerlove as having found an inverse association between financial leverage and mean rate of return and Baker (1973 p.503), who studied the same relationship, mentioned other authors' but not Nerlove's study. It seems better here to accept the author's conclusion and suppose that there is a problem with the description of his leverage measure. The relationship between profitability and financial leverage is so important a matter to be object of such a big mistake on the part of the author when concluding his work.

some attention to Carleton and Silberman's argument. He says that one possible explanation for the previous researchers' finding of the inverse relationship could be that high return on investment may be associated with high operating risk. Carleton and Silberman (1977 p.820) themselves classified the results from their final regressed equations as disappointing and this very fact may have prevented their analysis from being replicated by later authors.

Of the authors who had profitability and not financial leverage as the focus of the study, Arditti (1967 p.36) strongly refused his own finding of an inverse relationship. He first reasoned that it would imply that shareholders like debt and are therefore willing to take a lower return from firms that carry debt. He second argued that the reasoning on *a priori* grounds was much too convincing to accept such a result as descriptive of market behavior. He said there was only one explanation he could offer for the negative sign of the debt/equity coefficient. This was that some other risk variables positively correlated with the required return but negatively correlated with the debt/equity ratio had been omitted in his research.

Aggarwal (1981 p.76) provided one of the only two cases in the literature reviewed of a criticism addressed directly to an earlier work. He cast doubts on the finding reported by Toy and others (1974) of a negative relationship between profitability and financial leverage. He said that such a result could not be considered entirely reliable because of the exclusion of size and industry variables from their study. The other case is provided by Gale (1972 p.419), who argued that the significant negative relationship found by Hall and Weiss (1967 p.328) would be reversed if the analysis were controlled for market power differences. In fact, Hall and Weiss (1967 p.328-9), themselves, achieved this when they controlled for market power differentials by using concentration as a series of class interval dummies, but not when using concentration as a continuous linear variable or size.

Last, Titman and Wessels (1988 p.15) added a word of caution to their own conclusions by saying that their significant coefficient estimates for profitability were not necessarily inconsistent with the hypothesis of capital structure irrelevance. According to them, significant coefficient estimates for either, but not for both, the market value or book value measures of financial leverage are consistent with debt ratios being chosen randomly.

D.4. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

The reasoning that firms prefer to raise capital first from retained earnings because of transaction and asymmetric information costs that arise in the issuing of new equity or debt may be even more applicable if very small firms are considered. The literature on weaknesses of small businesses is full of assertions that transaction and asymmetric information costs are the responsible factors for the handicapped conditions in which these firms find themselves when trying to raise new funding from credit institutions. In addition, two more reinforce expectations that these enterprises will tend to substitute internal for external financing whenever they have the chance as a result of high profitability. These are the extremely high reliance upon unsecured trade credit on the part of the very small firms and the extremely high costs of this type of financing.

A point can be made to contradict directly the argument that pure economic reasoning and high level theory suggest that firm profitability and financial leverage should be positively correlated. Pure economic reasoning for being pure perhaps does not take into consideration that very small firms may be totally rationed by credit institutions. High level theory for having been constructed for big enterprises perhaps does not recognize that very small firms' borrowing decisions are taken with a view more to keeping the business running than to trading on their equity. These could be two more arguments to add to the many others forwarded in the specialized literature that claims that a theory for the small firms is for a long time overdue. Such a theory may prove useful also to discard the already referred simultaneous-equation bias as an explanation for the arguably anomalous and spurious negative association between profitability and financial leverage found by the majority of previous research works. If it cannot do this for all enterprises, it may at least for the very small firms.

Based on a careful inspection of the findings of previous empirical works too it seems more adequate to expect a negative relationship between profitability and financial leverage in the segment of very small firms. Fifteen out of twenty-one works directly reviewed, over 70%, and three researches cited by authors have found a negative association between profitability and financial leverage. The fact that one of

these directly reviewed studies has worked with the sizes of enterprises looked at in this research should make them even more suggestive. Only five works directly reviewed, less than 24%, have found a positive association. However, one of them has worked with a non-conventional measure of financial leverage, three others have worked at the level of industry and the remaining one has worked with a proposed, and not actual, financial structure. Besides, one of these studies has found a positive association but only in a simultaneous equations model and two others have not dealt with financial leverage as the main object of inquiry, but profitability instead. Finally, only three researches directly reviewed, around 14%[5], have found no association at all. However, one of them has worked at the level of industry only.

E. GROWTH AND FINANCIAL LEVERAGE

E.1. RATIONALE

Archer and Faeber (1966 p.72-3) assert that growth in earnings is primarily a measure of risk, together with size of the firm, variability of earnings, leverage, age of the firm, and other factors. Baxter and Cragg (1970 p.229) list several textbooks in corporation finance whose authors share this view. No matter how pioneering these works may be, justification for postulating a relationship between growth and financial leverage has been on other grounds. Gupta (1969 p.525), Toy and others (1974 p.877) and Marsh (1982 p.126 footnote 22) believe for very similar reasons that firms experiencing high growth will have relatively higher debt ratios. The first author claims that they are forced by their basic fund demand-supply equation to economize on use of current asset holdings and to borrow from all possible sources, including banks and trade creditors. The second authors, who allege to be backed by the theory of finance (p.880), say that their ability to retain earnings lags behind their market opportunities. The third and last author claims that they will tend to expand current assets faster than fixed assets while matching maturity of investment with that of financing.

Titman and Wessels (1988 p.4) appear to best summarize the thoughts of those theorists who suggest a negative relationship between growth and financial leverage. The arguments have to do with the ones discussed in the section on asset structure and financial leverage. So, for example, since growth opportunities are capital assets that add value to a firm but cannot be collateralized, firms trying to finance high growth will tend to use equity to avoid the more favorable terms required by creditors. In addition, firms in this condition will lose the opportunity to increase the value of their equity by expropriating wealth from the firm's bondholders, since this requires higher capacity to collateralize their debt. Last, growth opportunities do not generate current taxable income that needs to be sheltered by debt. Kale and others (1991 p.1706) also contribute here when they cite the costly contracting hypothesis of Smith and Warner (1979). This hypothesis predicts that high-growth firms, with large investments in intangible assets, would face higher covenant enforcement and monitoring costs and, hence, should have lower debt levels.

According to Myers (1977 p.149), firms with relatively large amounts of future investment opportunities will tend to work with a smaller proportion of debt in their capital structures. This author reasons like this because the presence of substantial amounts of risky debt may cause managers acting in the interest of stockholders to pass up many of the valuable investment opportunities. This may happen because the valuation gains from the investment would accrue to bondholders by reducing the risk of their claims on the firm. Although the variable included in this study is growth and not future growth opportunities, Myers argument is still important. As Roden and Lewellen (1995 p.80 footnote 6) point it out, historical growth can proxy the potential for profitable future growth, and thus growth may be inversely related to financial leverage.

E.2. EMPIRICAL EVIDENCE

Empirical evidence seems to be evenly distributed among positive, negative and no relationship. Gupta (1969 p.522,524) concluded that growth corporations tended to have high total debt to total asset ratios, although the same was not true for growth industries. Toy and others (1974 p.882) found that growth rate in assets was a highly significant, positively signed determinant of debt ratios in the United States and

[5] The percentage total surpasses 100% because some works dealing at the same time with many countries have come across with different findings for different countries.

Japan but of marginal significance in Norway and Holland. Kester (1986 p.13) presented table results showing positive and statistically significant coefficients for the growth measure for 5 out of 6 of his financial leverage measures. Barton and others (1989 p.40) found sales growth positively associated with debt levels. Bruno and Tyebjee (1985 p.69), who worked with new ventures less than 5 years old, found that high growth was statistically significantly associated with higher leverage. Last, Marsh (1982 p.126 footnote 22) cited evidence from Bray (1967) for the positive association between growth and debt ratios.

Titman and Wessels (1988 p.13) identified a positive and highly significant relationship between growth and long-term debt divided by book value of equity and a not so highly between growth and short-term debt over book value of equity. They, however, dismissed this finding mainly because the same was not found for the same measures of debt but scaled by market value. According to these authors, significant coefficient estimates for either, but not for both, the market value or book value debt level measures are consistent with debt ratios being chosen randomly (p.15). In addition, they argued that this result should not be viewed as necessarily being inconsistent with the theories that predict a negative coefficient. The observed positive coefficient would simply imply that, since growth opportunities add value to a firm, they increase the firm's debt capacity and, hence, the ratio of debt to book value, since this additional value is not reflected in the firm's book value (p.15). Myers (1984 p.586) cited Long and Maliz (1983) who found a statistically significant positive relationship between the rate of capital expenditure in fixed plant and equipment and the level of borrowing. Although Myers made use of this finding as evidence of a hypothesized relationship between type of asset and financial leverage, rate of capital expenditure has been utilized by researchers as a measure of growth instead. Because of this, taking Long and Maliz's finding as evidence of a relationship between growth, rather than asset composition, and leverage seems a correct decision here.

Kim and Sorensen (1986 p.131) found that high-growth firms used less debt rather than more debt. These authors measured the annual growth in earnings before interest and taxes as a proxy for the magnitude of growth projects across firms in their sample (p.136). Mehran (1992 p.552) reached the same conclusion by using research and development over sales as their proxy for growth opportunities (p.545). Roden and Lewellen (1995 p.83) came to same conclusion as the previous authors by using both historical growth on assets and a proxy for investors' expectations of future growth. Lang and others (1996 p.19) found their three measures of growth significantly negatively related to leverage, but only for firms with low Tobin's *q* ratio. These are firms whose growth opportunities are either poor or not recognized by the capital markets. For firms with high Tobin's *q* ratio the relationship was non-existent. More important, they found that these results held for a sub-sample composed of only relatively small firms.

Carleton and Silberman (1977 p.818-9), who dealt with industries as units of analysis, found that growth rate of sales was not significant in any of three equations, which consisted of three different manners of measuring financial leverage. Kale and others (1991 p.1707) arrived at the conclusion that their results were weakly supportive of a posited relationship between growth and financial structure. These authors in fact found the coefficient of their growth measure to be significantly negative in one out of two investigated years. John (1993 p.98) presented table results in which the coefficients for the growth measure were not statistically significant for her two conventional measures of financial leverage.

E.3. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

Theoretical arguments in favor of a postulated positive relationship between growth and financial leverage seem to better fit the reality of the very small firms than those in favor of a posited negative relationship. Faster expansion of current as opposed to fixed assets combined with simultaneous greater financing from trade creditors and clearing banks as a result of high growth sounds more like small firms' way of operating than that of their larger counterparts. On the other hand, collateralizing debt, expropriating wealth from bondholders and debt sheltering are phenomena that do not appear so much to make part of small firms' reality, as already discussed. Thus, it seems more sensible to expect a positive association between growth and financial leverage, at least as far as theoretical arguments are concerned.

Results of prior researches seem to be mixed in such a way not to justify the establishment of any expectation from them. Criticisms of earlier works are of no help here either, since none has been found in the literature reviewed. The only thing that can be said is that there is a slight tendency for the studies that found a positive relationship to rely a little more on conventional measures of growth. Because of this, it

appears more reasonable to keep for the empirical evidence the same expectation as that based on theoretical arguments, that is, of a positive association between growth and financial leverage.

F. INDUSTRY CLASSIFICATION AND FINANCIAL LEVERAGE

F.1. RATIONALE

According to Remmers and others (1974 p.24), Collins and Sekely (1983 p.45) and Aggarwal (1981 p.76), studies on the relationship between industry classification and financial leverage are based on the assumption that industry classification is a proxy for business risk. Remmers and others (1974 p.24-5) propose that the rationale for this may be that firms in the same industry face the same environmental and economic conditions and, therefore, tend to cluster with respect to variance of earnings and sales. Ferri and Jones (1979 p.631) are more specific when they say that such firms may experience similar amounts of business risk because they produce similar products, face similar costs for material and skilled labor, and rely on similar technology. Baker (1973 p.504) agrees partially with this when he says that the influence of industry on financial leverage may be ascribed to demand and cost risks. To make the reasoning complete, industry class would be related to financial leverage because business risk would be a most important determinant of financial leverage, according to the many arguments and the evidence discussed in the section on business risk.

However, other explanations for the postulated relationship have been forwarded. For instance, Remmers and others (1974 p.25) and Errunza (1975 p.75) argue that firms in the same industry may have similar debt ratios because of similar technology, liquidity requirements, type of collateral intrinsic in assets, overall level of profitability, and growth rate. Industry-specific institutional arrangements, tax allowances, other financial advantages arising from government policies, tax shelters, labor intensity, asset composition, and advertising and R&D expenditures are also cited by authors in this area of inquiry. Examples are Kester (1986 p.12), Boquist and Moore (1984 p.5 and 8), Barton and others (1989 p.39) and Bowen and others (1982 p.10-11). Errunza (1979 p.75) says that explanations seem to be peculiar to the special situation studied. This appears to be the case of the argument that debt ratios may differ across industries due to the presence or absence of substantial group interests in a particular industry.

Studies on leverage-related phenomena also suggest effects that the variable industry may capture. Leeth and Scott (1989 p.391) included industry dummies on their research on the determinants of the decision by the firm to provide collateral to secure loans to proxy for the marketability of assets. If marketability of assets determines the ability or decision to pledge collateral, then it may also influence financial leverage.

Some of the above variables, such as non-debt tax shields, firm volatility and advertising and R&D expenditures, are central to the arguments in favor of the "traditional" theory of optimal capital structure. Because of this, authors like Bradley and others (1984 p.871-2) and Bowen and others (1982 p.10-11) see the posited relationship between debt ratio and industry grouping as consistent with such a theory. Authors like Schwartz and Aronson (1967 p.10) also see this relationship as being one kind of evidence in favor of such a high level theory. Specifically, DeAngelo and Masulis (1980 p.24) take the findings by Schwartz and Aronson (1967), Scott (1972) and Scott and Martin (1975) on industry and financial leverage as evidence in favor of one of the predictions of their optimal leverage model. The prediction concerns the effects of non-debt tax shields that reduce the use of debt relative to equity.

F.2 EMPIRICAL EVIDENCE

As to empirical support to the hypothesized relationship between financial leverage and industry classification, there have been many studies on the subject with divergent conclusions. Schwartz and Aronson (1967 p.10) found that firms belonging to the same industry generally had similar financial structures whereas firms from different industry classes generally displayed different financial structures. The fact that they also found that the difference in financial structures of the industry classes persisted over time in spite of structural changes in the economy and changes in the level of taxes (p.10) reinforced the validity of their main findings. Scott (1972), trying to improve methodologically upon Schwartz and Aronson's work, came to the same conclusions as theirs. These conclusions included the one about

persistency over a considerable span of time. Scott and Martin (1975), replying to criticisms in the literature, updated and methodologically improved even further this study. Again, the same conclusions about the predicted relationship and its persistency over time were reached (1975 p.70). It seems important to note that this last study controlled for the variable size (1975 p.70). Errunza (1979 p.75) and Kester (1986 p.12) found a significant industry effect on capital structure even across countries. Aggarwal (1981 p.81) reached the same conclusions when analyzing capital structure and industry classification holding country constant. Bowen and others (1982 p.14 and 19) replicated the two results obtained by Schwartz and Aronson's study while being methodologically as careful as Scott and Martin. Finally, Bradley and others (1984 p.869) found that there was more variation in mean leverage ratios across industries than there was in firm leverage ratios within industries. In their study, almost 54% of the cross-sectional variance in firm leverage ratios could be explained by industrial classification.

The works by Ferri and Jones (1979), Collins and Sekely (1983) and Boquist and Moore (1984) resulted in less supportive conclusions to the hypothesis of industry classification as a determinant of financial leverage. Ferri and Jones (p.643) concluded that industry class was linked to a firm's leverage but in a less pronounced and direct manner than had been previously suggested. It is worth noting that these authors controlled the analysis for size, risk and percent of fixed assets. The work by Collins and Sekely (1983), which studied country, industry and profitability resulted in the conclusion by the authors that little support could be given to the effect of industry classification on capital structure (p.50). Last, Boquist and Moore (1984 p.8) found that, while total debt varied significantly across industry groupings, the use of interest-bearing debt did not. This finding made the authors severely qualify their support to the thesis that financial leverage and industry grouping are related to each other.

The studies by Stonehill and Stitzel (1969), cited in Collins and Sekely (1983 p.46), Remmers and others (1974) and Belkaoui (1975) resulted all in conclusions against the thesis that industry classification is a determinant of financial leverage. The research by Stonehill and Stit zel found no significant industry effect for firms that were in the same industry but headquartered in different countries. The study by Remmers and others found that industry appeared to be a determinant of corporate debt ratios for some countries but not for others (p.25 e 30). This inconsistency led the authors to conclude that industry, despite commonly believed to influence corporate financial structure, probably did not warrant the credence it received (p.32). Last, Belkaoui (1975) investigated the phenomenon for several years in Canada and found that his results might only lead to a rejection of industry as a determinant of debt ratios in that country (p.75).

F.3. CRITICISMS OF EARLIER WORKS

Remmers and others (1974 p.25-6) strongly criticized earlier works that found that industry determined financial leverage. They did so by attacking the statistical techniques employed by them and their sampling, in terms of numbers of industries, number of companies, composition of both, number of years studied and time interval between the years studied. Apparently, the most destroying criticism was directed to results. They argued that most probably profitability and rate of growth, rather than business risk, were responsible for the positive results found by earlier works. They concluded that the positive findings were no evidence backing the theory of optimal capital structure. Scott and Martin (1975 p.68 and 71) replied to these criticisms firstly by trying to eliminate most of the pinpointed weaknesses. It seems that it was not possible for them to explicitly reply to criticisms directed to results. They replied secondly by pinpointing weaknesses in the studies that concluded that had found no support for the hypothesized relationship.

Scott (1972), Remmers and others (1974), and Bowen and others (1982) criticized earlier works for using the F test associated with the results of one-way analysis of variance in a crude manner to analyze data. Bowen and others (1982 p.12, Footnote 9) became even suspicious of Belkaoui (1975) for failing to reject the null of no difference even in the face of two facts that once combined become very suggestive about results. First, only two means need be different to reject the null of no difference using an F test in a crude manner to analyze data. Second, Belkaoui himself reported large absolute differences in debt to common equity ratios across industries. Works finding an association between industry and financial leverage and using the F test have complemented the analysis with a test for the number of pairwise differences between mean industry leverage ratios. The ones by Scott (1972) and Bowen and others (1982) are good examples of the kind.

Scott and Martin (1975) and Errunza (1979) observed that past researchers had not examined the assumptions of normally distributed population and homogeneity of variance underlying the appropriate use of the tests chosen by them. The first authors directed this general criticism specifically against the Remmers and others' study. The conclusion that industry class did not have a significant influence on corporate financial structures could have been based upon an erroneous application of the parametric analysis of variance technique. According to Scott and Martin (1975), this is possible since it is not unusual for business and economic data to exhibit strong skewness. Researchers finding an association between industry and financial leverage have used either distribution-free tests complementarily to the utilization of parametric ones, or tests for checking for violations of assumptions, or even, both kinds. Scott and Martin (1975) used the first alternative mentioned while Bowen and others (1982) the last.

The different ways of measuring the two variables have been object of criticisms put forward by many authors. Ferri and Jones (1979), and Bowen and others (1982) directed the criticisms against the ways of measuring industry. The strongest criticism concerns the ways of partitioning firms into industries, which, according to these authors are characterized by two shortcomings. The first one is a lack of a disclosed rationale for them. The second one is that they invariably result in inconsistent classifications. One example is a classification encompassing in a class firms having for all of them the only common sic code a specific one-digit one and in another class enterprises all belonging to a specific four-digit sic level. Although, according to Bowen and others (1982 p.11), it is possible that rather inconsistent classifications have been causing some of the results, the criticism is directed indistinctly against works finding and not finding an association between industry and financial structure. Bowen and others (1982 p.11), who found an association between industry and financial leverage, reported using Standard Industrial Classification codes the way they stand. According to the authors, Sic codes the way they stand provide, as far as researchers are concerned, an exogenous means for grouping firms into functionally defined industries. Every grouping in their study included enterprises that belonged to only one specific four-digit sic level. Scott and Martin (1975), Bowen and others (1982) and Bradley and others (1984) directed the criticisms against the ways of measuring financial leverage. Researchers finding weak or no support for the postulated relationship between industry and financial structure have been criticized by the others for including preferred stock as equity and measuring equity at book value. Scott and Martin (1975 p.68) argue that sources of capital carrying prior claims on income and assets are to a high degree substitutable for one another. Consequently, the most appropriate balance sheet variable for measuring leverage usage is, according to the authors, the common equity ratio. Bradley and others (1984 p.871) argue that a measure of leverage based on the book value of equity is not consistent with the specification of theory, and hence is likely to produce weaker results. Bowen and others (1982) found very strong support in favor of the posited relationship by means of a measure based on book value and preferred stock as equity. In their work, results obtained using the total debt ratio strictly dominated those obtained using the common equity ratio.

Remmers and others (1974), who criticized the sample composition of other studies, had theirs questioned on the very same grounds by Scott and Martin (1975) and Bowen and others (1982). These authors alleged that Remmers and others (1974) made use of a biased sample of only big enterprises. According to Scott and Martin (1975 p.71), some large, economically powerful firms may be able to avoid the discipline of the capital markets with regard to financial structure that applies to smaller, less powerful firms. According to Bowen and others (1982 p.12), the focus on extremely large companies introduces a potential bias, for instance, due to conglomeration, which would tend to favor the null hypothesis that industries do not differ with respect to financial leverage. Accordingly, the null was not rejected by the work by Remmers and others (1974).

Another criticism by Remmers and others (1974) is that adjustment for other variables is necessary so that the industry effect can be accurately captured. The replication work by Scott and Martin (1975) did not address this criticism for it did not control for the variables profitability and growth, although did control for size. No other study that found an association between industry and financial leverage did so either. Therefore, it is not proved that the effect that the industry variable captures is business risk and not something else, like profitability and growth. If proving this is actually fundamental for backing the theory of optimal capital structure, then the criticism turns out to be a real shortcoming of the studies finding an association between industry and financial structure.

Other criticisms by Remmers and others (1974) seem to have all been satisfactorily addressed by later works finding support for the postulated association between industry and financial leverage. These are criticisms attacking sample size, number of years studied and time interval between the years studied.

F.4. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

As the theoretical arguments reviewed are numerous and backed by many theorists, they become a very strong reason for expecting the existence of an association between financial leverage and industry in a very small firms sample. Besides, and perhaps, most important, such relationship is predicted by the "traditional" theory of optimal capital structure. As already argued in the subsection on business risk, it should not be expected that a sophisticated corporate optimal capital structure theory would apply in its totality to the case of very small firms. Nevertheless, they are susceptible to bankruptcy as much as larger enterprises and consequently the traditional notion that firms with high business risk use less debt may be expected to make part of the reality of very small firms too. As the belief that industry is a determinant of financial leverage has much to do with its power to capture the effects of business risk, then such belief can accordingly embrace the case of very small firms. In case the business risk argument would not suffice for establishing the expectation for a very small firms sample, there are still many others already reviewed that seem to be as valid for such purpose.

Establishing expectations from empirical findings for the variable under discussion seems to have been eased by the rich debate in the literature reviewed about validity of results of previous works. It appears clear from the corresponding subsection that the researchers finding support for the posited relationship have almost completely dominated their opponents. The only shortcoming, although crucial, is that it has not been proved yet that the influence of industry on financial leverage can be ascribed to business risk. Notwithstanding, the mentioned superiority is more than enough to back the expectation for the existence of the discussed association in a very small firms sample. Such expectation seems very plausible because focusing only upon extreme large companies has been a criticism of research not finding support for it. To reinforce arguments further still, it may be added that the counting is favorable to the expectation for the existence of an association. Only three pieces of research have found no support for the postulated relationship between industry and financial leverage against eight that have found very strong and three that have found weak support.

The above favorable arguments are reinforced by results of recent research on the relationship between financial leverage and industry classification. Hull (1999 p.32) extended the stock-for-debt research by investigating whether stock value was influenced by how a firm changed its leverage ratio in relation to its industry leverage ratio norm. He found that announcement-period stock returns for firms moving "away from" industry debt-to-equity norms were significantly more negative than returns for firms moving "closer to" these norms. This finding is consistent with balancing optimal capital structure theory.

G. AGE OF THE FIRM AND FINANCIAL LEVERAGE

G.1. RATIONALE

Admittedly, there is very little in the literature on this factor. Archer and Faerber (1966 p.72-3), Leeth and Scott (1989 p.387) and Johnson (1997 p.54) included age in their leverage-related studies on the allegation that it was a measure of risk and reputation. Petersen and Rajan (1994 p.18) indirectly suggest that older firms should have higher debt ratios since they should be higher quality firms. Barton and others (1989 p.41) state that it is expected that mature firms will experience lower earnings volatility and can be taken as agreeing that, in turn, it is expected that these enterprises will have higher debt ratios. Of course, these authors speak of maturity, rather than age, but it seems intuitive to relate maturity to age in a direct fashion.

G.2 EMPIRICAL EVIDENCE

Empirical work is as rare as theoretical. Wedig and others (1988 p.37) reported finding age negatively associated with debt ratios at a high level of significance. They used cumulative depreciation divided by annual depreciation payments as the measure of age in their study on hospitals. Petersen and

Rajan (1994 p.18) found a significant and inverse association between age and financial leverage. It should be reminded that these researchers dealt with firms of the sizes at which this work looks.

Taub (1975 p.412) dealt with period of solvency, which was equivalent to age if the enterprise never experienced bankruptcy or a financial compromise settled for less than 100% of creditors' claims. They found that the period of solvency estimated coefficient never attained anything close to statistical significance, although always negative, contrary to expectations.

G.3. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

Theoretical elaboration is completely favorable to the existence of a relationship between age and financial leverage in a direct manner. As the corresponding arguments seem to be strong and well sounded, there seems to be no reason to establish expectations for a very small firms sample in discordance with them.

Empirical works as a rule have found an association but of inverse direction and contrary to expectations. Authors as a rule do not explain their contrary-to-expectation findings. Petersen and Rajan (1994 p.10) speculate that a natural explanation for this is that young firms are externally financed while old firms finance via retained earnings. It may also be that older enterprises become more traditional and consequently more averse to risk. Another possible explanation yet is that they have reached the last development phase of the life cycle model of capital structure, already seen on the subsection on size, when equity, public at this stage, becomes available. In the case of the very small firms depreciation financing could substitute for public equity in the model and result as well as in lower debt ratios for older enterprises. However, as all this is only speculative and not explored generally by the authors themselves, there seems to be no reason to establish expectations according to previous empirical findings and against strong theoretical arguments.

H. OPERATIONAL CYCLE AND FINANCIAL LEVERAGE

H.1. RATIONALE

Operational cycle means here average collection period plus average inventory age. There is no reference in the research literature reviewed to operational cycle as a determinant of financial leverage. On the other hand, finance textbooks deal to exhaustion with what is understood here for operational cycle when they address the working capital management theme. In fact, operational cycle is a determinant of working capital as much as operating level. Both are also determinants of total investment because of the very fact that working capital is part of that. In addition, it seems intuitive to believe that both are determinants of the absolute volume of debt of a firm too. As already seen, there are many reasons to believe that operating level, that is, size, influences positively financial leverage, a measure of the relative level of debt of a firm. Now, if operational cycle is related to size, it appears plausible to believe that these same reasons may dictate that operational cycle is positively associated with financial leverage too. This is part of the rationale justifying the inclusion of this variable in the study.

H.2. EMPIRICAL EVIDENCE

There is only one work in the financial structure literature that has indirectly looked at the interrelationship between these two variables. Gupta (1969 p.522) observed the existence of a significant and positive association between the ratio of total debt to total assets and fixed asset turnover of industries. He noted that such finding meant that industries that had high fixed asset turnover also tended to have high debt in their financial structure and that this could be due to the predominance of current assets in their asset structure. Now, what all this means is, first, that high fixed asset turnover combined with predominance of current assets is generally the other side of the coin of low current asset turnover. Second, low current asset turnover is in turn equivalent to long average collection period plus average inventory age. In conclusion, since average collection period plus average inventory age is what is here called operational cycle, what Gupta found was a significant and positive relationship between operational cycle and financial leverage.

H.3 EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

As far as theoretical arguments are concerned, expectations for a very small firms sample are the rest of the rationale leading to the inclusion of the variable operational cycle in the study. The reality of small firms is composed of short-term phenomena much more than that of big businesses, at least in relative terms. Flexible, short-term investment, financing, hiring and contracting are part of the day-to-day operations of very small firms much more than inflexible, long-term investment, financing, hiring, and contracting. Size, thought of in the same terms as those that underlie corporate financial leverage research, is a variable that encompasses these inflexible phenomena much more than operational cycle does. Therefore, it appears very reasonable to expect a stronger association between operational cycle and financial leverage than between size and financial leverage in a very small firms sample. The expected direction of the relationship is positive accompanying that of size itself.

As to empirical evidence, it is very fortunate that the sole work to investigate this variable has come across with a finding consistent with the above arguments. Besides, there seems to be no reason to question it. Consequently, expectations are established in accordance with its results, that is, for the existence of a direct association between operational cycle and financial leverage in the very small firms sample.

I. ENTREPRENEUR'S RISK TOLERANCE

Stonehill and Stitzel (1969 p.92) present national attitudes toward risk as an environmental variable that plays a role in the establishment of corporate financial structure country norms.

There is no reporting on previous experience with the use of a variable measuring risk-taking propensity in the reviewed corporate financial leverage research literature. Perhaps the main reason is that it is a dimension of business administration most difficult to measure in corporations. On the other hand, there is no denying that risk-taking propensity may be an important determinant of financial leverage either. In fact, it may be said that the opposite is what happens if a conclusion by Kim and Sorensen (1986 p.139) has any value. They concluded that, since over 80 percent of the cross-sectional variation in debt ratios in their study were left unexplained, debt decision would be then largely determined nonsystematically by managers across firms. Nonsystematic determination may be for the greatest part of it equal to risk-taking propensity. This view is consistent with a strong statement by Pettit and Singer (1985 p. 58). They say that one thing that is clear about the optimal level of debt and equity in a smaller firm is that it is more than likely a function of the characteristics of the firm and its managers.

Establishing expectations for this variable appears to pose no problems. It seems reasonable to expect the existence of a relationship between risk-taking propensity and financial leverage in the segment of the very small firms. The justification for this expectation is built upon two points. The relatively small number of operations makes it possible for the small entrepreneur to have an ampler vision of its firm. Because of this ampler vision, he is able to ascertain the risks involved and make decisions on possible alternative levels of financial leverage according to his own risk-taking propensity with efficiency. Of course, the expectation in terms of the direction of the association is for a positive one, that is, higher propensity for accepting risk associated with higher financial leverage.

J. INFLATION AND GENERAL ECONOMIC CONDITIONS AND FINANCIAL LEVERAGE

J.1. RATIONALE

Stonehill and Stitzel (1969 p.92) present inflation as an environmental variable that plays a role in the establishment of corporate financial structure country norms. Toy and others (1974 p.879) express sorrow for not being able to get adequate published data to measure inflation in their study on financial leverage in different countries. Their sorrow is a proof of their belief in the influence of inflation on corporate debt ratios. Collins and Sekely (1983 p.50) state that the relationship of national inflation rates and corporate debt ratios is an area that suggests further study. It is unfortunate that these authors do not present a rationale for the suggested relationship. However, since there is a scarcity of arguments in relation

to inflation comparatively to the other hypothesized determinants of financial leverage, their beliefs should be counted as supportive of the existence of the relationship.

Feldstein, Green and Sheshinski (1978 p.S62) derive an equation to represent the effects of inflation on the debt-equity ratio. According to this equation, in theoretical terms inflation can affect financial leverage either positively or negatively, all depending on the actual values of the parameters. For the values prevailing in the economy at the time of the article the effect would be positive, that is, higher inflation rates would be associated with higher financial leverage.

Hamada (1979) discusses in a theoretical essay the possible behavior of capital structure when analysis goes step-by-step from a most simplified world to more complicated settings, where tax, inflation and imperfect capital markets prevail. According to him (1979 p.356, footnote 9), debt versus equity decisions in a fully anticipated inflation-no tax world should be identical to the decisions made in a perfect capital market, stable-price world, namely, irrelevant for the maximization of the market value of the firm. Hamada (1979 p.359) states that with the introduction of tax, firms taken together would issue more debt, relative to equity, so that society would have more debt in a fully anticipated inflation-tax world. At the level of individual firms, however, capital structure decisions would be irrelevant once a new equilibrium in the economy as a whole would be attained. The author extends his analysis by introducing sequentially three more complications. These are (1) random ex post inflation combined with unbiased anticipations (p.361-2), (2) a one-time unanticipated shift in the expected inflation rate (p.362-4) and (3) chronic misconceptions of the true expected inflation rate (p.364-5). Capital structure decisions according to Hamada would in the aggregate be affected in all three situations, but, given the nature of assumptions made by the author, by way of almost only the mechanical effects of inflation.

DeAngelo and Masulis (1980 p.24) argue that, *ceteris paribus*, increases in inflation that increase nominal revenues will decrease the real value of investment tax shields, inducing firms to replace this tax shield loss by increasing their use of debt. This inducement would happen because a large number of corporate tax deductions are based on historical costs, such as depreciation, depletion allowances, and cost of goods sold.

Schall (1984 p.119-120), in a theoretical study on the effects of inflation on the firm's capital structure, works with the basic concepts of "Gain and Loss Effect" (GLE) and "Interest Effect" (IE). The former concept refers to the tax distortions introduced by using nominal rather than real gains and losses and the latter one refers to the tax distortions introduced by using nominal rather than real interest in tax computations. Tax distortions introduced by using nominal rather than real dollar amounts in determining taxes would affect debt and equity levels in the economy. Because of GLE and IE, equilibrium tax relationships with inflation differ from those that obtain when inflation is absent. Under simplifying assumptions, he shows that IE would encourage less borrowing in the economy and would dominate GLE. This in turn would motivate more borrowing by increasing equity taxes, the net impact being an inflation-induced tax incentive to decrease debt relative to equity. However, in general, the effects of GLE and IE are more complex and their net impact may be to increase or decrease the average level of corporate debt-equity ratios. It all depends on the changes in both the inflation and the nominal interest rates and on the relative magnitudes of borrower and lender tax rates.

Leeth and Scott (1989 p.383) state that depressed economic conditions is a characteristic associated with the likelihood of a firm's failure to repay its debts. Ferri and Jones (1979 p.640) say that studies indicate that in expansions even marginal firms have ready access to debt capital. However, in recessions the established firms that have both a record of past success and relatively good performance obtain a large percentage of the new debt.

J.2. EMPIRICAL EVIDENCE

DeAngelo and Masulis (1980 p.25) cited works with findings consistent with the proposition of a positive impact of inflation on financial leverage. Thus, they quoted Corcoran (1977), who observed that the average debt to firm value ratio in market value terms for non-financial corporations rose from 22% in 1965 to 42% in 1974. He also observed that this movement paralleled the acceleration in the domestic inflation rate. They also quoted Zwick (1977), who found a similar pattern by using a different measure of leverage, that is, face value of debt to firm book value. Last, They quoted the more

comprehensive study by Holland and Myers (1977), which measured the year by year aggregate debt and equity market values for all non-financial corporations in the U.S. for the years 1929-1975. The resulting ratios of market values of debt to firm assets were, as expected, highly variable with significant increases in leverage in the 1967-1975 period of high inflation.

DeAngelo and Masulis (1980 p.25 footnote 28) cited a work with findings apparently non-supportive of their proposition of a positive impact of inflation on financial leverage. Miller (1963) carried out this study, which measured the ratio of face value of long-term debt to book value of assets for five years intervals over the period 1926-1956. Miller found that this ratio was highly stable for all non-financial corporations but increased significantly for manufacturing corporations.

Hong (1977 p.1043) studied determinants of stock price changes for three periods that according to him were very different in terms of levels of inflation. One of his independent variables was corporate net debt position, that is, the difference between all-monetary liabilities and monetary assets of the firm, scaled by total assets book value. Table results showing summary statistics for the variable presented by the author were supportive of the proposition of a positive impact of inflation on financial leverage. The mean for corporate net debt position was the highest for the inflationary period that had the highest inflation rate and the lowest for the inflationary period that had the lowest inflation rate. The coefficient of variation was the lowest for the highest inflation period and the highest for the lowest inflation one. Hong (1977 p.1044) himself concluded two things. First, that his results were consistent with the hypothesis that inflation affects stock prices through additional tax burdens borne by firms. Second, that they were not consistent with the debtor-creditor hypothesis that inflation produces gains for debtors at the expense of creditors.

Soares and Procianoy (2000 p.13) found a significant and negative association between inflation and the total debt ratio defined in book values in a sample of 204 listed companies in Brazil. Inflation took the value one for the period March of 1991 to July of 1994, characterized by very high inflation rates, and zero for the period September of 1994 to December of 1997, characterized by comparatively very low inflation rates.

Ferri and Jones (1979 p.640) studied two years, a recessionary one and an expansionary one. They found that the level of statistical significance of the effect of size on leverage debt ratio was dependent upon the economic conditions of the particular year under analysis. It was higher in the expansionary period.

J.3. CRITICISMS OF EARLIER WORKS

DeAngelo and Masulis (1980 p.25 footnote 28) criticized the study by Miller (1963) for defining leverage in terms of only long-term debt. According to them, Miller himself admitted that, by ignoring short-term debt, he had downward biased the change in the leverage ratio over the sample period. Moreover, according to them, because of the tendency of corporations to make initial adjustments in leverage by altering their short-term debt, Miller's methodology was likely to be dampening the instability in the time series of his measured leverage ratios.

J.4. EXPECTATIONS FOR A VERY SMALL FIRMS SAMPLE

Arguments in the reviewed theoretical literature are all in favor of a postulated relationship between inflation and financial leverage. Establishing expectations from this literature is not, however, a straightforward task for three main reasons. First, all of it is concerned with economies that are not indexed. Because of this there is in it much emphasis upon anticipated versus unanticipated inflation. Brazil was in the period studied an almost all-indexed economy and this condition may correct for almost all, if not all, the mechanical effects of inflation upon the firms' capital structure. It may also substantially reduce worries about uncertainty of future inflation that might otherwise make lenders much less willing to provide debt financing. Second, almost all this literature is concerned with the combined effects of inflation and tax on capital structure. Great part of these effects would not be a problem in Brazil during the time of the study since the Brazilian tax system was indexed. Besides, as already remarked, income tax should not play an important role in very small firms' financial decisions, since tax evasion is notoriously quite widespread and very high among them mainly in developing countries like Brazil. Third and last, the reviewed theoretical literature is not concerned with chronic hyperinflation that can range from 65% to 1,783% a year, which was the case of Brazil in the period studied. Because of the first two differences, there do not appear to be

many reasons to expect a strong association between inflation and financial leverage in the very small firms sample of this study. On the other hand, under the third difference inflation can get so high that it is or appears to all economic agents to be completely out of control and, in this case, an association may be found. Whenever inflation went out of control, the possibility that the Brazilian government would take resort to recessionary economic packages was very high. Borrowers and lenders would refrain in face of bad business prospects. Small firms would show a bigger reduction in debt levels, as they are well known to be more externally finance constrained than their larger counterparts. As to the direction of the relationship, there seems to be more divergence in theoretical literature about it than as to the existence of a relationship. However, it seems from the considerations on the Brazilian inflation in this paragraph more plausible to expect an inverse one.

Findings in the reviewed empirical literature invariably lend support to a posited relationship between inflation and financial leverage and in the majority of the cases to a direct one. However, to set expectations from this literature poses problems as above. These problems have to do with the differences between the economies and sizes of enterprises dealt with in this literature and the Brazilian economy and the sizes of the enterprises herein studied. Firstly, absence of indexing and use of debt ratios defined in terms of book value may result in findings that capture only mechanical effects of inflation on debt ratios. Inflation has a mechanical positive effect on book debt ratios, if the historical value of equity is not corrected for it in the accounting system of the company. This happens for two reasons. First, because the book value of liabilities, mainly short-term ones, tend to be adjusted to current market prices earlier and faster than the book value of equity. The adjustment of the book value of equity is dependent on the occurrence of deflation or special arrangements allowed or imposed by law or by the generally accepted accounting principles. Second, because only liabilities grow due to the acceleration of inflation, they become bigger and bigger relatively to equity and so a bigger fraction of the sum of liabilities and equity. This is an issue not addressed by DeAngelo and Masulis (1980) when they took results of previous studies as evidence in favor of the predictions of their optimal capital structure model. Moreover, the methodology criticized by DeAngelo and Masulis may have been Miller's way of avoiding probably to a significant extent the mechanical effect of inflation on debt ratios. Secondly, the majority of the positive findings are obtained with debt ratios being defined in terms of market value and, as already observed there are not formal and explicit market values for the very small firms' debt and equity. Thirdly, inflation in the economies dealt with in the reviewed empirical literature is likely to be for most cases within a range believed by many, such as Hamada (1979 p.348), as beneficial in macroeconomic terms. In such a case, inflation would be inducing economic growth and this would be determining higher debt ratios in the economy. It is unthinkable that even the lowest annual inflation rate in Brazil would play such a role. In face of all these considerations, it seems more appropriate to maintain expectations as in the previous paragraph. It is worth remembering that the only work carried out in Brazil found a negative association between inflation and financial leverage.

General economic conditions should pose no difficulties for establishing expectations as to its association with financial leverage. Lack of discussion and empirical investigation over it seems to lead to this conclusion. General economic conditions may have much to do with inflation and insights into the behavior of the latter may tell much about the former variable. In any case, expectations could not be different from that general economic conditions are associated with financial leverage and in a direct manner.

K. OTHER FACTORS

Of course, there are other postulated determinants of financial leverage. However, they are omitted here for many reasons. One of the most important factors according to the related literature is income tax. The omission in this case is due to two facts. First, it would be most difficult to get information on income tax for the size of enterprises studied. Second, as already noted, income tax should not play an important role in very small firms' financial decisions, since tax evasion is notoriously quite widespread and very high among very small firms mainly in developing countries like Brazil. Because of the second fact, the omission of income tax from the specification will not bias the estimates. As to other possible factors, the main reason is that they are phenomena normally associated with large enterprises. Consequently, It is felt that the belief of no bias because of omission from specification can embrace them.

II. RESEARCH METHODOLOGY

A. SOURCES OF DATA

The data used in the present investigation are part of data gathered by means of a research effort that has been wider in methodology. However, it seems most appropriate to limit the discussion on the methodology of data collection to those aspects that concern the investigation being here reported. Moraes (1993) describes in more details the research strategy of the wider research effort.

The small firms studied have been randomly selected from directories run by trade associations of the three manufacturing sectors studied, namely, the furniture, food and clothing industries. The SINDIVEST-MG (Sindicato das Indústrias do Vestuário de Minas Gerais) has provided the researchers with lists with names, addresses, telephone numbers and preliminary data on number of employees of the clothing manufacturing sector enterprises located at Belo Horizonte and Contagem Cities, State of Minas Gerais, in Brazil. The SINDIMOV (Sindicato das Indústrias do Mobiliário do Estado de Minas Gerais) has furnished a list with names and addresses of the furniture manufacturing sector enterprises located in The State of Minas Gerais. The FIEMG (Federação das Indústrias do Estado de Minas Gerais) has given permission to the researchers to have access to its Guia Vida Industrial, which is a directory with names, addresses and telephone numbers of all manufacturing enterprises situated in the State of Minas Gerais, broken down by activity sector. This has been important for the selection of the small firms of the food-manufacturing sector. The SEBRAE-MG (Serviço de Apoio às Micro e Pequenas Empresas de Minas Gerais), which is the State of Minas Gerais' associate agent of the most important national institution for supporting the small business development effort in Brazil, has provided additional directories and catalogues that have helped with the work of localizing and making contact with the enterprises preliminarily selected through the directories of the trade associations.

The sample has been restricted to the three above business lines for some reasons. Firstly, time and cost constraints, on the one hand, and the complexity of the operational concepts, on the other, have precluded the study of a larger number of manufacturing sectors. Secondly, adding more manufacturing sectors to the study would magnify technical and financial difficulties, since small enterprises are not as prevalent in the majority of the other lines of business as they are in the chosen ones. In addition, sampling errors have been felt to rise by force of the same effect. Thirdly, it had been thought at the time of research design that industry was so widely accepted as a determinant of financial structure as to render it not much necessary to investigate its influence on financial structure. There was only a need for controlling for the influence of industry.

The sample has been also limited to enterprises located in the Cities of Belo Horizonte and Contagem. These are the two biggest cities in the State of Minas Gerais, being Belo Horizonte the Capital of the State. They are also the two biggest cities in the Great Belo Horizonte Metropolitan Area. This area is a most important industrial one in the whole of Brazil. The study has not been extended to other places for research financing constraint reasons only.

It had been decided at the time of research design that only enterprises with more than 15 and fewer than 200 employees would be included in the original work. Small firms with less than 15 employees would be excluded because they hardly produce profit and loss accounts and balance sheets on a regular basis and because these accounting reporting instruments are crucial for the kind of research being undertaken. This lack of regular accounting reporting happens for two reasons. On the one hand, enterprises of this size are free from paying income tax or pay it in a simplified way that frees them from keeping formal accounting records. On the other hand, as pointed out by Cardoso (1979), Tamari (1980) and Covin (1991), among other authors, accounting within small firms is generally seen as a by-law-imposed instrument, not managerial, which serves almost exclusively to fiscal purposes. They would be also excluded in view of the belief that the smallest firms do not vary much in terms of financial structure, all of them invariably working with only equity. Enterprises with more than 200 employees would be excluded because they are not considered small by most institutions working in the field of support to small firms. The inferior cut-off criterion has been relaxed in the original work in two situations to include four enterprises with less than fifteen employees. Three of these enterprises had had more than fifteen employees

in the years before that of the interviews. The other one was very young and its inclusion would enhance representation of the youngest ones. Because of missing data, only 2 enterprises with less than 15 employees have been included in the version of the work being reported. At the time of data collection, small firms of any size were excluded if found out that they were not totally independent of other enterprises to accord the research to a widely accepted qualitative criterion of firm smallness. An independent small firm is understood here to be one that is not part of a bigger enterprise and whose owner is totally free to make its own decisions. Because of the qualitative independence criterion, only enterprises with less than 150 employees have been selected in both the original work and in the version being reported.

The fieldwork took place from the end of the first semester of 1.992 to the end of this same year. Data have been collected from two sources. First, from year-end balance sheets provided by the very small firms for the years 1.986, 1.987, 1.988, 1.989, 1990 and 1.991. Second, from personal interviewing carried out by means of a structured interview schedule. Data on annual sales volumes and on year-end employment levels for the 1987 through 1991 period and on employment level at the time of interviewing have been obtained through the interviews. Given the nature of pursued data, interviewing the top man in the small firm himself has been a necessary condition. Because this could not be arranged for all cases, many small enterprises have been excluded from the sample. The use of assistants for conducting the interviews has not been felt to be suitable for many reasons having to with financial constraints on the research. Moreover, it has seemed desirable to keep the reliability of the data under the strict control of the researchers as much as possible. The way data from the two sources are used for measuring the variables worked with in the study being reported will be described in the next subsection.

Although people and institutions connected in different ways with the object of the research have been very collaborative, work in the field has faced many difficulties. Directories run by trade associations seem to be always out of date, since many firms that close down or change address do not bother to immediately communicate the change to the respective trade association. Consequently, researchers will always run into costs of organization and transport to get to the place where the firm should be without getting in the end any corresponding results in terms of data collection. Refusals from owner-managers have been less of a problem, but some financial statements have not been collected because of this. In fact, failure to collect financial statements has been due more to the fact that some enterprises, because of the small size and choice of way of paying income tax, had not produced balance sheets and profit and loss accounts. Although a figure has not been calculated, it can be stated that the response rate for the original work has lied somewhat between good and excellent. Data for 75 five enterprises have been collected for the purposes of the original work. Data for 41 firms correspond to the availability for the version of the research being reported. The difference is due to incompleteness of balance sheet information.

The somewhat ease of data collection reported in the previous paragraph may give a wrong impression about the research strategy. Whenever there is a belief that it is very difficult to gather data, high success in doing it raises the question whether there has been privileged access to data banks not available to people outside the institutions that maintain them. MacKie-Mason (1990 p.1473 footnote 6) says that Altshuler and Auerbach (1989) had access to necessary data only because the first author was a U.S. Treasury Department employee at the time of data collection. Although one of the authors in this research is a Tax Officer at the Brazilian Federal Tax Secretariat, he was working as an Assistant Professor of Finance at the Federal University of Viçosa at the time of data collection[6].

The proportion of enterprises of each line of business in the present version of the study is the following: clothing with 56% (23 small firms), furniture with 20% (8 small firms) and food processing with the rest, 24% (10 small firms). Complete descriptive statistics will be given in Part III.

B. VARIABLE DEFINITION

B.1 FINANCIAL LEVERAGE

Financial leverage is measured in different ways by different authors and in some cases by the same

[6] In fact, additional data have been gathered after the writing of this paper, bringing up the number of firms to 55 and the number of pooled observations to 179. Results from analysis of the larger sample are not very different, though.

author. First, there are those scholars who work with equity or net worth in the numerator of the formula of financial leverage and those who adopt debt for the same purpose. This difference in use should not make much difference in terms of statistical results. This is so much so that Collins and Sekely (1983 p.47) defined debt ratio as total debt to total assets but reported calculating it as one minus the ratio of stockholders' equity to total assets. On the other hand, Bowen and others (1982 p.12) note that interestingly studies that have used an equity ratio have found statistically significant differences in industry financial leverage while studies that have used debt in the numerator have not. Second, a seemingly more important difference is that between studies that adopt a more inclusive measure of debt and those that work with only long-term debt. According to Schwartz and Aronson (1967 p.11 footnote 4), the more inclusive measure corresponds to the concept of financial structure and the other measure to that of capital structure. These authors feel that, because of the high degree of substitutability between long and short-term debt, the broader concept is the more relevant measure of financial risk. Hall and Weiss (1967 p.329 footnote 9) stress the importance of the broader concept measure by noting that a substantial part of assets less equity is accounts payable, reserve accounts, and the like. Ferri and Jones (1979 p.632-3) allege that the broader concept measure reflects more completely a firm's total reliance on borrowed funds. These authors make use of the terms financial structure and financial leverage in a manner that implies that they are synonymous with each other and refer to the same concept (p.632). Tamari (1980 p.23) states that the assumption that underlies the use of the less inclusive measure, namely, that short-term debt financing is not of a permanent nature or is limited to investment in current assets, is questionable. DeAngelo and Masulis (1980 p.25 footnote 28) have criticized the work by Miller (1963) for making use of only long-term debt. According to them, corporations are likely to make initial adjustments in leverage by altering their short-term debt and so the use of only long-term debt may lead to mistaken results. Mehran (1992 p.544) notes that most theories of capital structure are silent about whether it is optimal long-term debt or the total debt that is being investigated. Archer and Faerber (1966 p.76), Hall and Weiss (1967 p.321), Schwartz and Aronson (1967 p.11), Gale (1972 p.420), Toy and others (1974 p.876), Remmers and others (1974 p.25 and 27), Scott and Martin (1975 p.68), Belkaoui (1975 p.75), Errunza (1979 p.74), Ferri and Jones (1979 p.632), Aggarwal (1981 p.77), Bowen and others (1982 p.12), Castanias (1983 p.1627), Collins and Sekely (l983 p.47), Boquist and Moore (1984 p.7), Kester (1986 p. 11), Mehran (1992 p.544), John (1993 p.94), Lang and others (1996 p.6), Barclay and Smith (1996 p. 7) and Kim and others (1998) all made use of the broader concept as their sole measure of financial leverage or, for a few, as one of the adopted measures. Sullivan (1974 p.1409), Carleton and Silberman (1977 p.818), Castanias (1983 p.1627), Bradley (1984 p.869), Kim and Sorensen (1986 p.138), Wedig and others (1988 p.32), Friend and Lang (1988 p.273), Titman and Wessels (1988 p.7), Barton and others (1989 p.40), MacKie-Mason (1990 p.1491) and Mehran (1992 p.544) used the narrow concept, which includes only long-term debt, as their sole financial leverage measure or as one of the adopted ones. Some authors have excluded only trade credit, short-term accruals from debt, or other spontaneous liabilities. This was the case of Rajan and Zingales (1995 p.1434) in the part of their work on cross sectional evidence. Many authors have reported that results with the narrow and the broad concepts are either very similar or better with the use of the broader concept. Third, authors also differ when making use of either book or market values. The majority of the reviewed authors have reported using book values. Ferri and Jones (1979 p.632-3) decided to use book value on the grounds of conceptual simplicity. Belkaoui (1975 p.75) justified his choice on the assumption that the relationship between the book value of debt and equity is the most relevant in determining lenders' and investors' claims to the profits of the firm. MacKie-Mason (1990 p.1489) quoted Myers (1977, 1984) who suggests that managers may rely on book measures because book value represents the fixed, or sunk, value of firm assets. Barclay and Smith (1996 p. 8) made their choice for market value by claiming that it is ultimately the long-term cash-generating ability of the firm, captured in its market value, not its balance sheet, that provides a better guide to corporate leverage. Fourth, a great number of authors use time-series-average measures of financial leverage and only a few make use of single period or year-end versions. Barton and others (1989 p.40) say that the aim of calculating an average is to capture the 'target' nature of leverage ratios by a simple smoothing of year-to-year data. Justification for averaging is that firms tend to have target leverage ratios, but year-to-year fluctuation may occur as different forms of financing are used. According to Shyam-Sunder and Myers (1999 p.220), the traditional theory of finance predicts a cross-sectional relation between average debt ratios and characteristics of the firm as a result of reversion of actual debt ratios towards a target or optimum. Only Rajan and Zingales (1995 p.1452 footnote 27) and MacKie-Mason (1990 p.1478) reported lagging one period to reduce the problem of endogeneity and avoid simultaneity bias, respectively. Fifth and last, authors also differ when choosing the denominator of the formula of the financial leverage measure. The majority of the authors make use of total assets, but there are those who choose to use other variables such as net worth, common stock at book value, or even capital, defined as total debt plus equity.

The foregoing has dealt with the most commonly used measures of financial leverage. Some authors use a non-conventional measure as their sole or together with conventional measures of financial leverage. Flath and Knoeber (1980 p.105) and Kale and others (1991 p.1705) made use of the ratio of interest payments to EBIT and cash flow, respectively, as their measures of financial leverage. Castanias (1983 p.1627) additionally worked with the sample semi-enterquartile range of total liabilities to net worth as a measure of financial leverage. Fischer and others (1989 p.34) worked with the concept of debt ratio range instead of that of debt ratio. Thus, their measure of financial leverage was the difference between the maximum and minimum debt ratio over their studied time span. Agrawal and Nagarajan (1990 p.1326) worked with the concept of all-equity firms as opposed to that of levered firms. They defined all-equity firms to be firms that used no long-term debt over a continuous five-year period. Levered firms were firms that maintained a ratio of book value of long-term debt to firm value of at least 5% in each of the five years studied. Last, Taub (1975 p.411), Marsh (1982 p.127) and MacKie-Mason (1990) used a dycotomicous variable that took the value of 0 when the firm issued equity and 1 when the firm issued bond. It may be accepted that some of the variables described in this paragraph are not really measures of financial leverage but of related concepts instead. MacKie-Mason (1990) worked with the traditional measure of financial leverage, as reported in the previous paragraph, but as an independent variable instead.

All the six basic choices in this study follow those of the majority of the authors reviewed in the two previous paragraphs. Following the majority of authors seems to be a reasonable justification for the approach taken, but for some of the basic choices additional arguments are put forward. First, a conventional measure of financial leverage is used. Besides the argument of following the choice of the majority of authors, it can be said that the approach taken corresponds to the simplest, most feasible and most reliable way of measuring financial leverage in this work. Trying to make use of, for example, the ratio of interest payments to EBIT would mean facing three great difficulties. One of them is that there are no direct, explicit and accountable interest costs for most of the debt available to small firms. Another one is that small firms generally refuse to provide information on profit and loss accounts much more than they do with relation to balance sheets. The third difficulty is that profit and loss accounts are much more prone to be artificially manipulated with the intention of tax evasion than balance sheets are, as will be seen in the section on business risk below. Second, debt, instead of equity or net worth, is the numerator of the formula of the measure of financial leverage. The lack of arguments in the reviewed literature in favor of either approach compounded with the argument of following the majority of authors seems to sufficiently back the choice made. Third, the use of the more inclusive measure of debt is the choice for this study. The arguments of the scholars who favor the use of total debt is in this case the second justification for the choice, for they seem to make it more sensible to adopt the broader concept of debt. A third justification is the conviction that to study the relationships that are investigated in this research by taking into consideration only long-term debt is a task that is for the present sample certainly destined to failure. The reason for this is that the mean proportion of that type of funding among the surveyed firms is only 3.6% with a standard deviation of 6.4%[7]. Such a justification appears to be so much more important than the other two as to eliminate their weight. Furthermore, this decision is in accordance with the opinion by Rajan and Zingales (1995 p.1428 footnote 11) that in countries or specific classes of firms that use trade credit as a means of financing, accounts payables should be included in the measures of leverage. Fourth, as to the choice between book and market value, the former one is used since there is no formal market value for the liabilities of the very small firms studied. The fact that the majority of authors reviewed have made use of book values and the existence of very convincing arguments that favor their use are not relevant. Fifth, the total asset figure is the denominator of the formula of the financial leverage measure. Since no arguments have been offered in the reviewed literature to favor or otherwise this choice or any other, following the majority of authors seems to be the best justification for the choice made in this study. Sixth and last, both a time-series-mean measure in a main cross-sectional regression equation and a single-period, year-end measure in a main and in four auxiliary pooled time-series cross-sectional regression equations are used. In the time-series-mean measure, the ratios are calculated for a time span of one to six years, depending on the availability of data, which is three years for the majority of cases. Three years may seem too few, but Jalilvand and Harris (1984), who worked with financial leverage target-adjustment models, reported that

[7] Analyses carried out after the writing of this paper for short and long-term financial leverages in separate confirm that interpretation of results becomes very difficult. This is due more to loss of significance levels for some independent variable coefficient estimates in either or both specifications, since there is only one case of sign reversal. The sign of the growth variable coefficient estimate becomes negative in the long-term financial leverage regression equation.

use of a three-year moving average did not alter their results obtained with a long-term historical average. A second justification for additionally working with a time-series-average measure is the argument by the reviewed authors that firms tend to have target leverage ratios, but year-to-year fluctuation may occur as different forms of financing are used. For the sake of precision,

$$FINANCIAL\ LEVERAGE = \frac{Total\ Debt}{Total\ Assets}. \quad (1)$$

Some work has been done before the calculation of the values for financial leverage so that the balance sheets first reflected the perspective of finance instead of that of accounting. The first change has concerned that part of accounts receivable discounted by commercial banks, which from the viewpoint of accounting in Brazil is deducted from the total of accounts receivable. It has been added back to the total of current assets and to the total of short-term liabilities. This is accepted as a financially correct procedure since what the commercial banks really do is money advancement guaranteed by trade notes receivable and not factoring. The second change has concerned the amount of the reserve constituted to account for future expected bad debt loss, which from the point of view of accounting in Brazil is deducted from the total of accounts receivable. This reserve account has been added back to the total of current assets and to net worth. Justification here is that bad debt loss does not occur in the moment that the reserve account is created, which is in reality a moment in which a tax incentive is given to the firm. The third change has consisted of submitting leasing transactions to an adjustment procedure to make them part of the long-term debt financing and at the same time represent an item of the fixed asset account group. In Brazil, this kind of transaction is not registered in the accounting system of the firm, since it lacks the characteristics of a conventional financing transaction. From the viewpoint of finance, it represents a medium-to-long-term kind of funding. The fourth and last change has consisted of making fixed assets net of depreciation in those cases where depreciation was still represented in the balance sheet by a reserve account of the net worth group. The corresponding amount has been deducted from both net worth and fixed assets. In the Brazilian accounting system, depreciation is not directly deducted from fixed assets in face of the difficulty of precisely determining it.

Cash, inventories, accounts receivable, notes receivable, operating fixed assets and financial fixed assets are the only accounts to enter the computation of the denominator of the formula of the financial leverage measure. Items like prepaid expenses, expenses of future fiscal years, money advancements to employees, prepaid income tax, recoverable costs, expenses to be appropriated are not considered. The justification for such a procedure is that, in principle and from the viewpoint of finance, the investment decisions that really influence the firm's financing decisions are only those that are non-transitory and essential for the efficient and effective operation of the firm. From this point of view, cash balance and inventory, for example, are items that, instead of being viewed as mere net results of debit and credit account entries, goods and rights, or even sources of resources to pay for maturing short-term liabilities (an accounting viewpoint), should be considered in terms of their fundamental justification for economic existence. Thus, cash balance should be viewed as a reservoir that plays the role of a regulator in view of the fact that individual cash receipts and cash disbursements rarely coincide as to both the moment and magnitude of occurrence. Inventories of raw materials, semi-processed products and finished goods consist in reservoirs that exist to make it possible for the purchasing, production and sales departments to function according to their best working cadence (for instance, difficulties experimented with relation to raw material suppliers should not in principle become production stoppage). Operating on a hand-to-mouth basis is typically expensive. The items excluded from the calculation of the denominator of the formula of the financial leverage measure may belong to one out of three classes. They may be items whose existence does not have important implications for the enterprise. They may consist in losses that should already been diminished from the net worth. They may represent either operating small and transitory credit values or special treatment spared to employees, clients or suppliers, which are not common to or do not make part of the day-to-day operations of the enterprises. Moreover, it is very possible that the year-end balance sheets are biased in such a way to show these items having both diversity and magnitudes not observed along the rest of the year.

As to the numerator of the formula of the financial leverage measure, accounts payable, commercial banks discounted accounts receivable, short-term loans and long-term debt financing are the only items to enter its computation. Accounts such as outstanding salaries, income tax provision, outstanding labor taxes, profits to be paid out, and the like are not considered. In addition, owners' loans to

the firm are not considered. With the exception of this last item, such accounts are more what are generally called in Brazil functioning debts than funding sources. They are very short-term transitory liabilities. No firm should build any financing strategy upon such "kind of financing". Moreover, they probably are over-represented in year-end balance sheets. As to owners' loans to the firm, it seems more appropriate to consider them transitory equity than debt. Money belonging to small firms interchanges with money belonging to their owners possibly with favorable implications. It is well known that small firms take resort to this kind of funding quite frequently. Moreover, it is assumed that owners' loans are not comparable to actual debt financing when creditors' claims and rights are considered. Thus, incorporating owners' loans to the firm back to net worth seems a desirable correction, at least as far as the computation of meaningful debt ratios is the objective.

Most of the adjustments described in the last two paragraphs are similar either in nature or in objective to the ones carried out by Ranjan and Zingales (1995 pp.1428-34). A version of this work without most of these adjustments has yielded results qualitatively inferior to the ones that will be reported in Part III.

B.2. BUSINESS RISK

Baxter and Cragg (1970 p.229 footnote 12) observe that textbooks in corporation finance suggest that many variables may capture the influence of business risk on financial leverage. According to them, variance of earnings would be very relevant, but other measures may also be indicative. Examples would be the ratio of the minimum to the average value of earnings over some period, the growth rate of earnings, the level of current assets, the ratio of fixed to total assets, and other balance sheet ratios. In effect, researchers do use a variety of measures, sometimes more than one in the same research, being earnings before interest payments and taxes the most common choice as the basis for constructing such measures. This was the case of Taub (1975 p.411-2), Carleton and Silberman (1977 p.817-8), Flath and Knoeber (1980 p.101), Marsh (1982 p.132), Kim and Sorensen (1986 p.136), Kester (1986 p. 12), Friend and Lang (1988 p.273), Wedig and others (1988 p.32), Barton and others (1989 p.40-1) and John (1993 p.95). Bradley and others (1984 p.871), MacKie-Mason (1990 p.1490), Kale and others (1991 p.1704), Roden and Lewellen (1995 p.80) and Johnson (1997 p.54) reported using operating income before depreciation, interest and taxes instead of EBIT. Kim and others (1998 p.349) worked additionally with operating income before depreciation, interest and taxes minus capital expenditures. Baxter and Cragg (1970 p.231) and Ferri and Jones (1979 p.633) made the option for pre-tax cash flow. Archer and Faerber (1966 p.76), Toy and others (174 p.878), Titman and Wessels (1988 p.6) and Mehran (1992 p.545) only stated that used earnings or operating income.

MacKie-Mason (1990 p. 1476) states that the "correct" measure of risk depends on the stochastic process generating net income. Contrary to what might be expected, calculating the coefficient of variation of earnings is not the commonest manner in which authors handle this variable to obtain their measure of business risk. In fact, of the authors reviewed, only Archer and Faerber (1966), Ferri and Jones (1979) and Kim and Sorensen (1986) reported using this measure in the final statistical analyses. Toy and others (1974) reported measuring the coefficient of variation of the earnings rate and Barton and others (1989) of EBIT/TA as their proxies for business risk. Friend and Lang (1988) made use of the ratio of the standard deviation of EBIT to assets. Baxter and Cragg (1970 p.231) opted for calculating the ratio of the variance of cash flow to the average cash flow. Carleton and Silberman (1977 p.817-8) made the choice for the variance of EBIT/assets calculated for the industry level. Roden and Lewellen (1995 p.80) reported using the standard deviation of earnings. However, the commonest fashion in which scholars use earnings seems to be the standard deviation of either their percentage changes or first annual differences scaled by some size variable, such as average total assets or annual mean of earnings. The second of these two ways of measuring business risk is sometimes called standardized growth. Examples of use of these measures were given by Ferri and Jones (1979), Marsh (1982), Bradley and others (1984), Wedig and others (1988), Titman and Wessels (1988), MacKie-Mason (1990 p.1490), Mehran (1992), Johnson (1997 p.54) and Kim and others (1998). Authors point it out that one of the advantages of these measures is that, as they are standardized, they are independent of size, what means decoupling volatility from the sheer effects of size. Taub (1975) regressed earnings per share against time and used the residual variance divided by the square of average earnings as his proxy for business risk. Flath and Knoeber (1980) regressed earnings against time and used the residual variance divided by one minus the coefficient of determination for the same purpose. These two authors state that these measures are invariant to the scale of the firm and avoid the

error of giving a high uncertainty value to a growth firm. Kester (1986 p.12) regressed his measure of return on assets against time and used the sum of squared residuals as a proxy for volatility. Finally, Marsh (1982) and Kale and others (1991) provided the most sophisticated examples of ways of working with earnings. The first author calculated one of his measures by dividing fixed charges-earnings before income and tax into the estimated standard deviation of earnings. The second constructed two proxies for the standard deviation of the coefficient of variation of earnings. They were (i) the standard error of an OLS regression on time and (ii) the maximum likelihood estimate of the standard deviation of a linear regression of earnings on time assuming a first-order autoregressive process in the error term (AR). Marsh (1982), himself, confessed that his measure did not measure business risk but total risk instead, given the influence of the level of gearing on it.

Researchers compute their measures of business risk also from bases other than earnings. Ferri and Jones (1979 p.633) additionally used sales and Fischer and others (1989 p.34) size, that is, total liabilities plus common equity market value. The first author computed both the coefficient of variation of sales and the standard deviation of the standardized growth in sales. The second author computed the standard deviation of the logarithm of the ratio of $size_{(t)}$ over $size_{(t-1)}$. Baker (1973 p.504) made use of industrial output by means of computing the adjusted coefficient of determination of a regression against time. Petersen and Rajan (1994 p.17) calculated the standard deviation of the gross-profits-to-assets ratio for each firm but averaged the resulting figures to obtain a measure of risk for each firm's industry. Castanias (1983 p.1624), although not declaring, apparently equivocally used historical failure rates, a clear total risk variable, most probably affected by the firms' debt level and ratio, as his measure of business risk. Among the articles reviewed, authors have reported working with a variety of time spans, ranging from 3 to 20 years. Archer and Faerber (1966) used 3 to 5 years, depending on availability, Baxter and Cragg (1970) 4 and Carlenton and Silberman (1977) and Ferri and Jones (1979) 5.

Naturally, many authors have reported experimenting with other measures not shown in the analyses presented by them. The reasons put forward for not showing the results vary. First, the measures have not worked as expected. Second, they have worked but the one fully reported provided more insight or otherwise. Third, they have not changed the results in any way or not substantially. Fourth, they have worked but results from them might be due to spurious correlations. Last, still not exhausting the possibilities, data have not been available for many firms in the sample.

Sales are the pertinent revenue selected for this study because of their obvious importance and other reasons. Sales constitute the basis and source of the bulk of a firm's income. It is then the variability of sales, before anything else, that is magnified by the mechanism of operating leverage to obtain most of the variability of EBIT, which is apparently the most accepted measure of business risk. If things were different, such a theme would not receive so much attention in textbooks on financial management. Besides the importance of sales and the meaning of its variability, there is the fact that a measure for operating leverage, though to some extent flawed, is included in the regression analyses. This is asset composition. Hence, there is the hope that the research captures through sales variability and asset composition most of the influence of business risk on financial leverage.

Another reason, certainly more important than the one above from a point of view of research feasibility, concerns the availability and reliability of data on EBIT in Brazil and for the size of the companies studied. To the authors' knowledge, no data sources like COMPUSTAT data tapes existed in Brazil until the time of this research fieldwork, let alone something in this line for very small firms. The Brazilian equivalent to the United States Internal Revenue Service is obliged by law not to disclosure fiscal data. Data on small firms have then to be gathered from these enterprises themselves. However, no academic in Brazil challenges the widespread belief that the refusal rate on the part of businessmen to give over year-end profit and loss accounts, from which EBIT could be calculated, is very high. Besides, as stated with relation to most countries by Tamari (1980 p.30), it is even more peculiar to small businesses to fail to completely record the accounting effects of their operations and to manipulate profit and loss accounts and income statements to lower the amount of federal, state and municipal taxes. Consequently, the sad reality is that, even if a few profit and loss accounts were collected, the EBITs calculated from them would be either unreliable or useless and would yield either unsatisfactory or misleading statistical results. It is a widespread belief that such profit and loss accounts follow no pattern other than that of randomness. Confronted by this, it seems much wiser to try to get by means of interviews with entrepreneurs the actual figures only on sales and under a secrecy commitment. Acceptance of this research strategy on the part of entrepreneurs has

proved to be higher than trying to get the whole profit and loss accounts. However, a later checking with the Brazilian equivalent to the United States Internal Revenue Service's files has shown that the sales information handed over to the researchers corresponds without exception to the same declared in the firm's annual tax statement.

Only two researches on the determinants of financial leverage have reported using sales as the basis for a measure for business risk. Ferri and Jones (1979) have already been mentioned above. Baxter and Cragg (1970, p.231 footnote 15) experimented with the variances of sales divided by their averages, but did not show the results because this measure worked no differently from that based on cash flow. The use of EBIT is overwhelmingly, but it should not necessarily imply on this ground only that sales are not an appropriate basis for calculating a measure of business risk. It is an undeniable fact that a measure based on sales captures the effects of only one of the main components of business risk, but it is undeniable too that it may be the most important of all them. Besides, operational leverage, another widely accepted major component of business risk, is supposed to have its effects captured through the variable asset composition. Finally, it is only natural that researchers make practically total use of EBIT. If there is availability of reliable data for big businesses and in developing countries, it would be worrying if they did not make such a use without adequate justification. Nevertheless, it is felt that, had they to work with very small firms, then, most certainly they would have no alternative other than to resort to sales to work in the way it is done in this research.

As to the manner to work with the basis variable to get a measure of business risk, the choice is calculating the standard deviation of the first annual differences in the basis variable scaled by its mean. For the sake of precision:

$$VARIABILITY\ OF\ SALES = Stddev\left[\frac{Sales_t - Sales_{t-1}}{Mean\ Sales}\right], \tag{2}$$

where t is time, ranging from three to five years, depending on either for how many years the firm had been operating until the time of the research or availability. The appropriateness of such a choice is supported by three arguments. First, the present study follows in this respect the majority of the authors above reviewed. Second, Bradley and others (1984 p.871) cited Chaplinsky (1983), who presented a discussion of why the standard deviation of the first differences in earnings is the appropriate proxy for firm volatility. According to her, the standard deviation of the first differences in annual earnings, scaled by the average value of the firm's total assets over the period, does not suffer from the statistical problems associated with alternative measures of firm volatility. Since the case made by the quoted author appears to concern more the manner of working with the basis variable than the chosen basis variable itself, it lends additional support for the choice made in this research. Third, the very way the measure works reinforces the appropriateness of its choice. This will be revealed in the next paragraphs and in Part III. The logarithm to the base ten of the measure works a little better in the regression analyses and consequently it is the version used in the reported results.

Many other measures have been tried, but it seems worth reporting only on the coefficients of variation and determination because the others have been only tentatively used without precedent in the literature. On the one hand, the coefficient of variation of sales appears to measure variability. It correlates with the standard deviation of standardized growth, defined in equation (2), being r=0.69 and s=0.00, and with other independent variables with which the standard deviation of standardized growth also correlates. On the other hand, however, it appears to measure growth too, because of its simple correlation coefficients with two growth measures, with which the standard deviation of standardized growth does not correlate at all. With growth on sales the simple correlation coefficient is r=0.60, s=0.00, and with growth on the number of employees it is r=0.48, s=0.00. Most probably because of this, it does not correlate with the measure of financial leverage and does not yield 'good results' in the regression analyses. It seems adequate to stress that the standard deviation of standardized growth does not correlate even with a measure of growth built upon the same basis variable as it itself is, that is sales. The simple correlation coefficient between growth on sales and growth on the number of employees is r=0.74, s=0.00. All this is taken as validating the measure chosen and enough ground to discard the coefficient of variation of sales.

As to the coefficient of determination, data for three to five years are considered too few to allow constructing a measure from regressing sales on a time trend. The variable number of employees, for which

data have been gathered for six points in time and the data set is more complete, is consequently used in place of sales. Instability is defined then as one minus the coefficient of determination of a compound model of regression of number of employees on time. As results with this measure are totally disappointing, it is discarded too. At first glance, this discarding could be seen as a great loss, since the advantage of such a measure, according to its users above reviewed, is to avoid giving a high uncertainty value to a growth firm. However, as seen in the previous paragraph, the standard deviation of standardized growth, differently from the coefficient of variation of sales, is totally independent of growth.

Last, it should be reported that it has been necessary to complete missing years of first differences in annual sales scaled by mean sales with first differences in year-end employment scaled by mean employment for one year in three cases. This procedure has made it possible to get more values of variability of sales and, consequently, more firms in the analyses. Nerlove (1968 p.318) reported interpolating missing observations of yearly sales from adjacent values in a time series, but other authors may do it without reporting.

B.3. SIZE

Aggarwal (1981 p.80) affirms that sales are the most common measure of size. Besides him, Remmers and others (1974 p.30), Ferri and Jones (1979 p.633), Kester (1986 p.12), Titman and Wessels (1988 p.6), Barton and others (1989 p.41), Kale and others (1991 p.1703), Mehran (1992 p.555) and John (1993 p.95) made use of this basis variable to obtain the figures for their measures of size. As to the way sales are dealt with, most authors take their logarithm natural and a few use interval classes of sales volume, which may be equivalent to the logarithm natural depending on the criterion utilized to define the range of the classes. Some researchers use the sales figure for the current year, but the majority takes resort to an average of sales for some period. Contrary to Aggarwal's assertion, assets and not sales have been the most commonly measure used by the authors herein reviewed to study the effects of size on financial leverage. Thus, Archer and Faerber (1966 p.75), Scott and Martin (1975 p.70), Taub (1975 p.412), Ferri and Jones (1979 p.633), Marsh (1982 p.132 footnote 37), Colins and Sekely (1983 p.48 exhibit 3), Castanias (1983 p.1627), Kim and Sorensen (1986 p.137), Titman and Wessels (1988 p.6 footnote 5), Friend and Lang (1988 p.274), Fischer and others (1989 p.34), Mehran (1992 p.550), Roden and Lewellen (1995 p.79), Barclay and Smith (1996 p. 16) and Kim and others (1998 p.349) all made the choice for assets as their sole or one of their basis variables for deriving the measure of size. MacKie-Mason (1990 p.1491) preferred to use net assets, which were defined as total assets less current payables. Out of these 16 works, 10 took directly total assets to express size against 6 that used either the logarithm of assets or interval classes of the assets figures. The overwhelming majority of these works made use of book value of total assets instead of market value and an expressive number of authors worked with an average of five-year total assets figures as opposed to the current year figures. Ferri and Jones (1979 p.633), who worked with both, single and long-term measures of size, felt that the latter might give a truer indication of firm size than single period measures. Aggarwal (1981 p.80) reported using additionally profits and number of employees as measures of size. Equity market capitalization, quit rates and hospital bed numbers are other examples of variables used as the basis for calculating measures of size.

The research by Leeth and Scott (1989) deserves separate mention. Two aspects of their work make their case very pertinent to the present research. First, their sample was composed of over two thousand cases, all of which from very small businesses. Second, their study on the determinants of the incidence of secured debt used number of workers as the main size measure (p.392). They reported attempting alternately to measure size by using the dollar value of sales and the book value of assets, but also reported that results were inferior.

From four possibilities, namely, total assets, fixed assets, sales and employment level, this last is the chosen one to be the variable basis from which to compute the values of the measure of size in this study. Total assets and fixed assets would not be good choices because they are more likely to generate spurious results in a multiple regression analysis than number of employees. This is very possible because total assets and fixed assets are used in the computation of another measure, namely, asset structure, and, because, like the variables from which the measure of financial leverage is computed, they are balance sheet data. Although this a very sound criterion to guide the choice, the main reason for the option made is that employment level is the only variable basis whose measure works as expected in the regression analyses.

While the other three variable bases are highly correlated with each other, being r=0.97 and s=0.00 or higher, number of employees correlates with each of them at the level of around r=0.50 and s=0.00. Following an expressive number of authors, the final expression of size is the logarithm to the base 10 of the number of employees instead of the original figure. Contrary to what Ferri and Jones (1979) felt (p.633) and found (p.642), the current year figures work a little better than the time-series-average. Interestingly, they work a little better than the year-end figures in the pooled time-series cross-sectional regressions too.

Because of the above reported and because the option made here runs against the overwhelming majority of authors' choices, the question of robustness of results, or perhaps more correctly put, the lack of it, must be addressed. Although the issue will be completely addressed in the part on results, two things can be said here. First, because of the labor-intensity nature of the very small firms studied in this work, employment level may really be a better indication of their size than total assets, fixed assets and even sales. Second, because they are not accounting items, figures on employment level may be more suitable to capture the size effect on financial leverage. During data collection, they seemed to be less subject to the tax evasion lowering bias on values of variables and to the accounting randomness phenomenon already discussed in the section on business risk. Rejecting these arguments may imply the belief that social nature likes to play around and so has amazingly arranged for two sampling errors to coincidently happen in this work on very small and labor-intensive enterprises. The first sampling error would be that these enterprises' measure of size and labor intensiveness is associated in the expected direction with financial leverage. The second would be that financial leverage is not associated with other measures of size usually used in studies on big enterprises.

B.4 ASSET COMPOSITION

The majority of authors discussed in the part of this work on literature review have worked with the ratio of fixed to total assets as the sole or one of the measures of the concepts investigated by them. Ferri and Jones (1979 p.634) used the ratios of percentage change in EBIT to percentage change in sales and of fixed to total assets, both for the current year and for a five-year interval, as their measures of operating leverage. The average ratio of fixed to total assets yielded better results than its single-year equivalent (p.641). Different authors have used different measures for the concept of collateral value of assets. Titman and Wessels (1988 p.3) took the ratio of intangible assets to total assets and the ratio of inventory plus gross plant and equipment to total assets. Wedig and others (1988 p.33) made use of the ratio of plant and equipment to total assets. Friend and Lang (1988 p.273) chose the ratio of net property, plant and equipment to total assets. Mehran (1992 p.545) selected inventory plus gross plant and equipment as a percentage of total assets. Some of these authors have stressed their use of book values as opposed to market values and of multi-period averages to reduce measurement error due to random year-to-year fluctuations in the variables. Bradley and others (1984 p.871) measured their concept of non-debt tax shield by means of the use of the sum of annual depreciation charges and investment tax credits divided by the sum of annual earnings before depreciation, interest and taxes. They arrived at the conclusion, though, that this measure of non-debt tax shield worked in fact as measure of asset composition, since they found a significant positive coefficient with financial leverage (p.874). Kim and Sorensen (1986 p.138), studying the same concept as Bradley and others, made the choice for measuring it by means of the average rate of depreciation for 6 years, that is, depreciation charges divided by fixed assets. Baker (1973 p.505) investigated the concept of cost fixity that he took to be indicated by one minus the ratio of variable costs to total revenue net of advertising and profit. Marsh (1982 p.132) made use of the ratio of fixed to total assets, both net of depreciation, as his measure to study the concept of asset composition. Last, MacKie-Mason (1990 p. 1477,1490) made use of the ratio of plant less accumulated depreciation to total assets less current liabilities to proxy for the concept of committed investment already in place. This author needed to control for moral hazard effects of debt.

The ratio of fixed to total assets is taken as the appropriate measure to investigate most of the above concepts that in this study the concept of asset composition is understood to summarize. Following an expressive number of authors, a time-series-average version of this measure is used in the cross-sectional regression and it is in the majority of the enterprises on a three-year average basis. Rajan and Zingales (1995 p.1452 footnote 27) reported averaging their explanatory variables to reduce the noise and to account for slow adjustments. Year-end figures are used in the pooled time-series cross-sectional regressions. Values are book values and net of depreciation.

B.5. PROFITABILITY

The choices of variables to serve as bases for the measure of profitability vary among the reviewed authors in such a way that sometimes it is difficult to tell if they are any different from each other. Earnings available for common equity, EBIT, EBT, EBIT minus nonoperating income, cash flow, operating income, net income, profits, gross profits are examples of the variables that are taken for the numerator of the formula of profitability. For the denominator, the most common ones are common equity, total assets, stockholders' equity, shareholders' funds and net fixed assets plus working capital. Gale (1972 p.420), Toy and others (1974 p.877), Sullivan (1974 p.1409), Carleton and Silberman (1977 p.812), Marsh (1982 p.134), Collins and Sekely (1983 p.47), Barton and others (1989 p.40), Friend and Lang (1988 p.273), Petersen and Rajan (1994 p.17), Roden and Lewellen (1995 p.80) and Kim and others (1998) all made use of a combination of these numerators and denominators. Aggarwal (1981 p.80) and Titman and Wessels (1988) additionally used sales as denominator. Most of these authors have informed taking book values. Baker (1973 p.503) reported using after-tax profit rate without specifying the denominator. Hall and Weiss (1967 p.320) took rate of return after tax on year-end equity plus and minus windfall losses and gains. Four scholars have differed greatly from the others. Nerlove (1969 p.316) chose to work with the rate of discount that equates the discounted value of the flow of dividends during the period and the stock price at the end of the period to the initial stock price. Taub (1975 p.411-2) calculated profitability as the difference between the expected future return on the firm's capital and the pure rate of interest, being an earnings price ratio the proxy for the expected future return. Kester (1986 p.11) calculated a return-on-assets ratio based upon a combination as above, but worked in the regressions with expected profitability. This was obtained from the calculation of a simple OLS prediction of return on assets for each company using observations for the preceding years. Kale and others (1991 p.1704) tried to capture firm profitability by means of the use of the ratio of capital expenditure to total assets. Some authors have reported taking an average of either ten or five years and weighing differently the years of the time series.

Shortcomings of using data from very small firms' profit and loss accounts for computing research measures in developing countries have been dealt with in the subsection on business risk. Because of them, data for use in any of the above ways of measuring profitability have not been collected. It has not even been tried a perceptive question on what level profitability was felt to be by the entrepreneurs for fear that they would feel tempted to dissimulate. The measure used is constructed from an interview question asking the entrepreneur to rank from alternatives given in the schedule the relative importance of each source of funding. Therefore, for the answer that profits are the most important of all sources is given value 5 for the corresponding firm in the scale of profitability. For the answer that profits are the second most important source of funding is given the value 4 for the corresponding firm in the scale of profitability. The procedure goes on like that and the lowest value, that is, zero is given to an enterprise for which the answer is that profits are not among the five most important sources of funding.

Rajan and Zingales (1995 p.1457) state that profitability for small firms may proxy for the amount of internally generated funds. This should be even truer for the present work whose enterprises are much smaller than Rajan and Zingales' small firms. The original interview schedule question upon whose answers the measure of profitability is built had as the main goal to evaluate the relative importance of internally generated funds. Therefore, this is the rationale behind the decision to measure profitability the way it is measured in this work. The very small firms that assess profits as the most important of all sources of funding would most likely be the most profitable of them all. The above seen conventional ways of measuring profitability do not seem to be viable in the case of very small firms situated in developing countries. Consequently, alternative ways must be tried.

B.6 GROWTH

Carleton and Silberman (1977 p.818) affirm that from the point of view of finance theory, for a firm in equilibrium, sales, assets, earnings and dividends are all expected to grow at the same rate. Accordingly, authors vary on the use of these variables to generate measures of growth to study its influence upon financial leverage. Carleton and Silberman (1977 p.818) and Barton and others (1989 p.41) made use of sales to obtain the values of their measures for growth. The first authors did so by means of a log linear

growth regression model and the second authors by means of a uniform one. Toy and others (1974 p.877) made use of total assets by means of a simple linear regression model to compute the values of their measure for growth. Titman and Wessels (1988 p.4) and Roden and Lewellen (1995 p.80) made use of the same basis variable but by means of percentage changes to compute the values of their measure for growth. Archer and Faerber (1966 p.76) and Kim and Sorensen (1986 p.138) chose earnings as the basis variable from which to calculate the values of the growth measure by using a simple linear regression model and the geometric mean, respectively. Kester (1986 p.12) made use of revenues as a basis for calculating his measure, which was the compound average annual rate of growth in that variable. According to him, revenues have the overriding virtue of being measured on a current dollar basis. Bruno and Tyebjee (1985 p.68) worked with three arbitrarily defined sales growth classes. Other scholars have used these basis variables and other variables in a combined way, alternatively to the use of a regression on time, means and percentage changes, to generate ratios as their growth measures. Thus, Kale and others (1991 p.1704) made use of the ratio of capital expenditures to total assets and Mehran (1992 p.551) resorted to the ratio of research and development expenditures to sales. Titman and Wessels (1988) used these two ratios also in addition to the one above referred. Roden and Lewellen (1995 p.80) worked with the ratio of the market value of the firm's common equity plus the book value of its debt and preferred stock to its net assets as an additional measure of growth opportunities. Lang and others (1996 p.6) worked with three measures of growth, of which one was based on number of employees.

Number of employees is chosen as the basis variable for this study. Because it is not among the ones generally chosen by researchers on the determinants of financial leverage, justification seems to be necessary. In relation to total assets, the preference is twofold. First, Carleton and Silberman's above assertion on what finance theory predicts may in its totality only concern big enterprises. It seems intuitive that for the sizes of the enterprises studied in this research, because of their notorious labor-intensive nature, growth in their operation level would be reflected more quickly and more thoroughly in growth in their employment level. Second, as reasoned in a previous section on size, total assets are more likely to generate spurious results in a multiple regression analysis than number of employees. In relation to both, sales and total assets, number of employees seems to be a better choice because there are more data and more points in time from which to compute values for the measure of growth in a theoretically more reliable way. In relation to sales, experimenting with them in one measure produces disappointing results. As to the way the number of employees is dealt with in order to get the growth measure figures, the choice made is in accordance with the above reviewed authors, since a regression on time is used. The compound model yields the highest simple correlation coefficient with the measure of financial leverage and because of this it is the chosen one. For the sake of precision,

$$Number\ of\ Employees = a\, b^{Time}, \tag{3}$$

where the rate of growth = b – 1. It should be stressed that only five cases are calculated with less than 6 years of data on employment level. Reporting on other measures of growth worked with is here omitted because there is no precedent for them in the literature and results are not improved by their use.

B.7. INDUSTRY

Schwartz and Aronson (1967 p.10-1) used 4 broadly classified firm groups, which were railroads, electric and gas utilities, mining, and industrials. Remmers and others (1974 p.25) limited their choice of industries in their international study to the manufacturing sector. Their nine-industry sample included appliances and electronics, chemicals, farm and industrial machinery, food, metal manufacturing, metal products, motor vehicles and parts, paper and wood products, and petroleum refining. Scott and Martin (1975 p.67,73) worked with 12 industries belonging to a classification showing some overlapping with that studied by Remmers and others (1974) and including industries out of the manufacturing sector, such as retail stores. Belkaoui (1975 p.75) made use of 13 industries quite similar to those of Remmers and others (1974) and Scott and Martin (1975), adding two new ones, namely, construction and materials and transportation. Errunza (1979 p.74) studied 10 other specific types of industries. Ferri and Jones (1979 p.633) used two different measures of industry type. One was the conventional four digit SIC code, with 25 groups of firms. The other one was a generic measure combining similar dominant product lines and SIC codes, with 10 groups. According to information given more specifically on the second measure, the industry classes by Ferry and Jones (1979) did not differ much from those of the other works. Aggarwal

(1981 p.77) worked with thirty-eight different classes. Bowen and others (1982 p.13) worked with 9 industry dummies, introducing for the first time air transportation and treating retail department stores as a distinct class from retail food chains. Colins and Sekely (1983 p.47) dealt with 9 very commonly used industries, Boquist and Moore (1984 p.7) made a choice of 7 industries very similar to those of Bowen and others (1982), and Bradley and others (1984 p.869) chose 25 industries classifying retail department stores and retail grocery stores as distinct types. Finally, Flath and Knoeber (1980 p.108), Fischer and others (1989 p.35) and Kale and others (1991 p.1706) made use of very different industry variables given their specific hypotheses to be taken to test. The first authors worked with one class of three regulated industries and one class for all others. The second ones divided the sample into, on the one side, machine- and equipment-manufacturing firms and, on the other, all others. The third authors investigated the classes representing extractive, manufacturing and transportation. Kim and others (1998 p.351) grouped their sample firms into industry categories by using three-digit sic codes. Kim and others (1998) did not study financial leverage but corporate liquidity instead. All authors have treated the industry classes as dummy variables when using regression analysis or in an equivalent way when using other analytic techniques.

The aim to investigate the influence of industry classification on financial leverage is restricted in this work to only three groups. Attempting to fully explore the factor by adding more industry types would imply high costs, which would be most certainly well beyond the funds available to the research. These costs would rise not only as a function of the number of additional industries but also because there are much fewer small firms out of the traditional manufacturing sectors. Thus, furniture, food and clothing are the three industries here considered. Retail, and services as a whole, where small firms are prevalent, is not considered. This exclusion is justified by the choice for concentrating resources for a deep investigation of the studied phenomena that are known to manifest themselves more fully in the manufacturing sector because of the additional activity of transforming goods. Inserting the industry variable into the regression equation as if it were an interval variable produces much better results. Handling the industry variable like this supposes that the difference in financial leverage between the manufacturing sectors of furniture and food is the same as the one between the manufacturing sectors of food and clothing. Although this is different from the approach of all the authors reviewed, all presented equations are regressed in this way.

B.8. AGE

As seen in the part of this work on review of literature, few researchers interested in studying the determinants of financial leverage have included age in their works. Consequently, little exists in this literature on the ways age of the firm is measured. Taub (1975 p.412) dealt with period of solvency, which was equivalent to age if the enterprise never experienced bankruptcy or a financial compromise settled for less than 100% of creditors' claims. Wedig and others (1988 p.34) used in their study on hospitals cumulative depreciation divided by annual depreciation payments as their measure of age. Archer and Faerber (1966 p.76) expressed age of the firm in terms of years since formation as reported at the time of issuance of the funding instrument studied. Leeth and Scott (1989 p. 387) worked with the number of years the firm had been in business. Johnson (1997 p.54) defined age as the number of years since first incorporation. It should be noted that these last three authors did not study financial leverage but, respectively, cost of externally secured equity capital, incidence of secured debt and corporate debt ownership structure instead. Last, it is very unfortunate that Petersen and Rajan (1994) did not describe the way they measured their age variable in their study on small enterprises. However, it seems only natural to assume that they measured directly as Archer and Faerber (1966) did.

Age is measured directly in this study. The corresponding data have been collected through interviews by means of asking the entrepreneur when the firm was founded and calculating the number of years until when the research fieldwork took place. The logarithm to the base ten of age shows better results and so it is used in the reported analyses.

B.9. OPERATIONAL CYCLE

As seen in the part of this work on review of literature, Gupta (1969 p.522) was the only author to look at the interrelationship between operational cycle and financial leverage. His approach was indirect, as already seen, and he made use of financial ratio analysis. Thus, his conclusions on what in this work is

called operational cycle were reached via observing the behavior of the fixed asset turnover ratio in relation to the ratio of total debt to total assets.

In this work, operational cycle is measured by summing the answers by the entrepreneurs to the questions in the interview schedule on the average ages of inventories (raw material, semi-processed and finished products) and accounts receivable for their enterprises. The decision to measure operational cycle in this way reflects the view that one more measure computed from accounting data might yield spurious results in a multiple regression analysis. As already seen, fixed assets, total assets and total debt are balance sheet figures used to calculate two other measures, namely, asset composition and financial leverage.

It seems worth reporting on a balance sheet measure computed with the sole purpose of validating the interview schedule one. Such a measure is inventories and accounts receivable accounting age, calculated by means of multiplying the sum of the figures of inventories and accounts receivables by 360 and dividing this product by sales. The simple correlation coefficient between this measure and that of asset composition, that is, the ratio of fixed to total assets, is r=-0.47, s=0.00. This is a figure very much around the one to expect having as a reference the figures found by Gupta (1969). The simple correlation coefficient between the natural logarithm of the interview schedule measure of operational cycle and the accounting inventories and accounts receivable age is r=0.49, s=0.00. Such findings seem to indicate that the measure of operational cycle used in this work really measures what it is supposed to measure. Besides, both measures of inventories and accounts receivable age correlate with a measure of industry, where food=0, furniture=1 and clothing=2. The correlation coefficients are r=0.67, s=0.00, and r=0.43, s=0.00, for the accounting version and the natural logarithm of the interview schedule version respectively.

B.10. ENTREPRENEUR'S RISK TOLERANCE

The time when the interviews were carried out was characterized by very high inflation rates, ambiguous economic set up, examination by the Brazilian Congress of the Country's President impeachment and widespread fear in face of recurring governmental recessionary economic packages. Entrepreneurs were asked how they thought the market should be exploited in this all-unfavorable social and economic atmosphere. Specifically, they were asked to position themselves on a scale ranging from 1 to 5, corresponding 1 to maximum caution and 5 to maximum entrepreneurial riskiness. Taking these values directly is the way entrepreneur's risk tolerance is measured in this work.

B.11. INFLATION AND GENERAL ECONOMIC CONDITIONS

Leeth and Scott (1989 p.388), who studied the determinants of pledging collateral, controlled for the expected rate of inflation and general economic conditions by using a fixed effects framework. Specifically, they created a series of 26 binary variables to measure the quarter in which each loan was originated.

Following the above authors, five binary variables are used to estimate the effects of inflation. However, results will be reported in the next part of the work on only the one that is statistically significant in the regression analyses. It is set equal to one for observations taking place in the year 1989 and zero otherwise. 1989 is the year when inflation was very high and the highest amongst the studied years. The inflation rates for these years were 65% in 1986, 416% in 1987, 1,038% in 1988, 1,783% in 1989 and 1,477% in 1990, according to variations in the general price index run by Fundação Getúlio Vargas.

Running the regression equations with the above inflation rates in place of the 1989 dummy variable produces unsatisfactory results. On the other hand, results with a measure whose values are the exponential transformations of the inflation rates are almost the same as those obtained with the 1989 dummy variable. The coefficient estimate of the exponentially transformed variable is the only thing that is different. This exponential transformation implies than that the impact of inflation on financial leverage is the bigger the bigger inflation is. For ease of presentation of results, the 1989 dummy variable is preferred.

Estimates of the effects of general economic conditions are obtained by means of the use of many economic indicators, like gross domestic product and rate of unemployment. Best econometric results are

obtained from the use of annual variation in the manufacturing gross domestic product. Consequently, results will be reported in the next part of the work on only this measure of general economic conditions.

C. INSTRUMENT OF ANALYSIS

The method of analysis used is that of multiple regression. The method of estimation used is that of OLS. The mathematical model used is:

$$Y = \frac{1}{1 + e^{-(a+\Sigma b_i X_i)}} \cdot \tag{4}$$

Following the logic choice of Flath and Knoeber (1980), this mathematical model is adopted for two reasons. First, because it is assumed that the financial leverage measure is constrained to lie between zero and one. Second, because out of the many functions that have this characteristic, the above one permits linear estimation, simplifies calculations, and at the same time is somewhat general. Barclay and Smith (1995 p.621) also preferred the use of OLS to the appropriate Tobit estimator in their study on the determinants of corporate debt maturity, where their dependent variable was restricted between zero and one. Rajan and Zingales (1995 p.1452 footnote 28) reported that Tobit and OLS results were very similar. Petersen and Rajan (1994) made use of a one-sided Tobit model as they assumed that the firm's debt ratio was censored only at zero. However, it seems highly unrealistic to work with this assumption if the dependent variable studied is the firm's target debt ratio, which as already seen is best represented by an average of a historical series of debt ratios. In addition, debt ratios above 1 are very difficult to find among firms operating normally in the market. In this sample, the maximum is 0.71 for the time-series-average cross-sectional data set and 1.05 for the pooled time-series cross-sectional data set. Furthermore, the above authors had as their focus the determinants of the availability of credit to the firm and not the determinants of the firm's financial leverage and this might explain their choice of equation. Anyway, running a regression under the same assumption as theirs produces results very much similar to those to be reported later in this work.

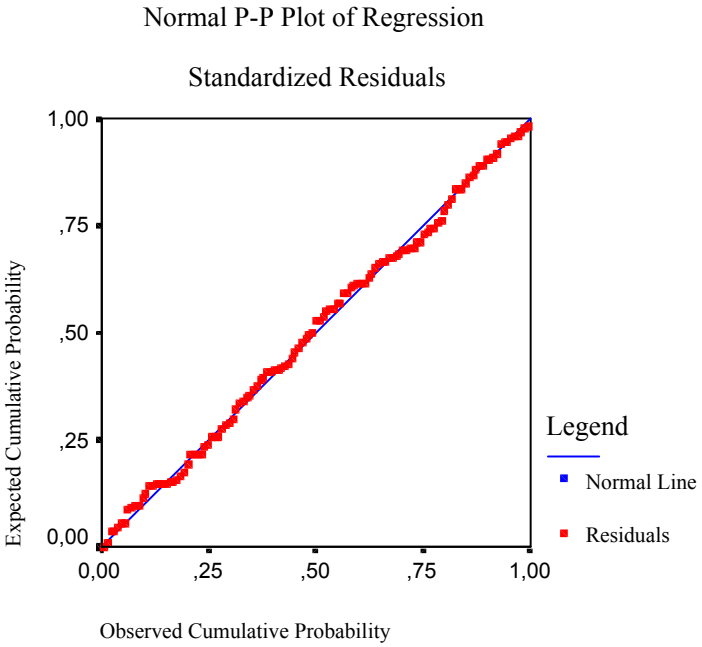

Figure 1

To investigate the hypothesized financial leverage relationships, cross-sectional and pooled time-series cross sectional regressions are estimated on the various explanatory variables. The cross-sectional specification is useful because it exploits cross-sectional variation in the data. The pooled regression

specification is useful because it exploits additionally time-series variation in the data. Besides, it enhances significance through increasing sample size. Errunza (1979 p.74), in a piece of research facing difficulties for collecting data similar to those of the present work, justified using total debt ratios for different years as replicate observations as a recourse to improve statistical significance by means of increasing sample size.

It is felt that, because of the highly satisfactory results to be described later, searching for violations of the assumptions underlying multiple regression analysis is very appropriate. The normal probability (p-p) plot, Figure 1, shown on the previous page, makes it possible to examine the residuals for departures from normality. Inspection of the graph reveals that there seems to be no reason to conclude that the assumption of normality of residuals is incorrect, since the points fall overall close to a straight line. While the graph exhibits very slight irregularity, it does not appear abnormal for a sample of 123 observations from a normal distribution.

The plot of the residuals against the predicted values, Figure 2, shown below is one of many tools used to check for violations of the equality-of-variance assumption. The graph does not seem to exhibit any systematic pattern, suggesting that perhaps no heteroscedasticity is present in the data. According to Gujarati (1988), because of results of pioneering past research on family budget, it is now generally assumed that in cross sectional data involving heterogeneous units, heteroscedasticity may be the rule rather than the exception. Thus, heteroscedasticity is generally expected if small-, medium-, and large-size firms are sampled together. Perhaps it does not happen in the case of this study because the sample is composed of only very small firms, although of differing sizes. The use of Spearman's rank correlation test to verify if the spread of the residuals increases or decreases with values of the independent variables signalizes absence of heteroscedasticity in the data. The correlation coefficients are always very small and non-significant.

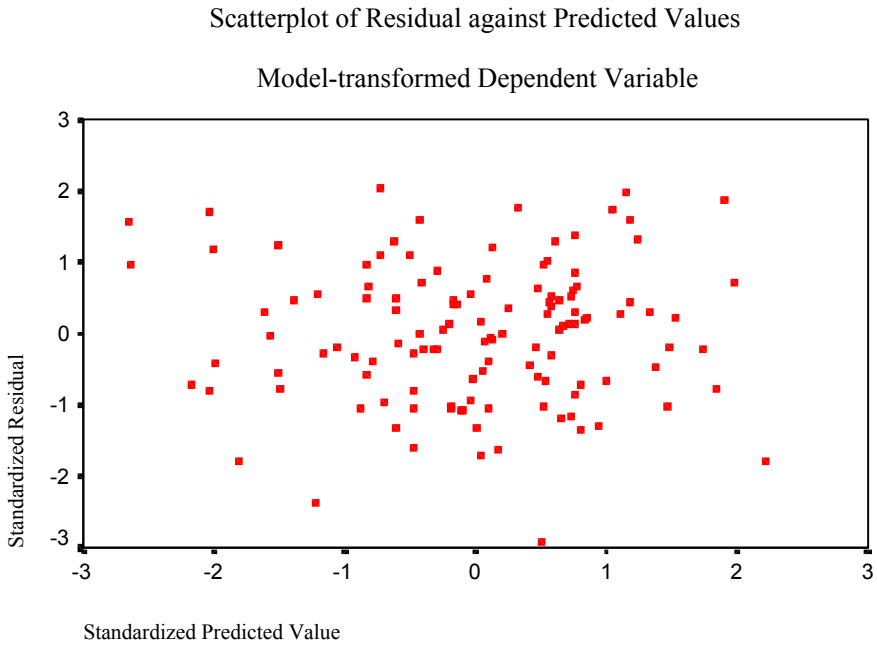

Figure 2

Another assumption of the classical linear regression model is that there is no multicollinearity among the explanatory variables included in the model. According to Gujarati (1988), some authors believe that the condition index is the best available multicollinearity diagnostic. It is used here for detecting multicollinearity based on the following definition:

$$CI = \sqrt{\frac{Maximum\ \ eigenvalue}{Minimum\ \ eigenvalue}}\,. \qquad (5)$$

The calculated value for the present sample data is 24.67. As the value interval 10 to 30 would indicate, according to a rule of thumb, the existence of moderate to strong multicollinearity, the phenomenon under

discussion does not seem to pose a problem for this work. Severe multicollinearity is the real problem, but this, according to the same rule of thumb, only happens if the CI value exceeds 30.

The Durbin-Watson *d* statistic is used to check for the presence of autocorrelation. The estimated figure is 2.066, which falls in the zone of rejection of the existence of both negative and positive autocorrelation. Textbooks on statistics do not seem to display tabulated values of d_L and d_U for 123 cases, but the test is robust for either 100 or 150 cases and 9 explanatory variables. The test is significant at the levels of 1% and 5%. Barclay and Smith (1995 p.619) state that running the regression in a single cross-section eliminates the problem of serially correlated errors. As in their case, the cross-sectional regression here is a cross-sectional regression using the time-series mean of each variable by firm. Thus, the use of the cross-sectional regression in this study serves also as another way to account for the potential error-dependence problem.

Some observations on this checking for violations of assumptions are necessary to end the subject. First, it should be said that all these analyses are carried out in relation to the main regression equation for the pooled time-series cross-sectional data set to be presented in the next part of the work. Carrying them out in relation to the equation run for the time-series-average cross-sectional data set produces results that are very alike. Because of this, they are not reported. Extending the analysis to the remainder equations seem to be unessential for the very reason that they are only secondary to the work, although helpful. Second, it seems to be important to call attention to the fact that the dependent variable in these analyses is not 'Total Debt/Total Assets', but instead, as a result of linear transformation of the mathematical model adopted, the following:

$$LN \frac{Total\ Debt / Total\ Assets}{1 - (Total\ Debt / Total\ Assets)}. \tag{6}$$

One consequence of such a transformation is that some work towards correcting for violations of assumptions is done by it, since the shapes of the frequency distributions of the two variables are different from each other. These distributions will be shown in the next part of the work. Finally, this observation takes the discussion to another checking for violation of assumptions, namely, that the model of linear regression is correctly applied to an actual linear relationship between variables. Figure 2 shown in the previous page confirms this, since the plotting of residuals shows to follow no definite pattern.

III. EMPIRICAL RESULTS

A. SAMPLE CHARACTERISTICS

Table I on next page reports summary statistics on all of the variables for the pooled time-series cross-sectional data. If shown, the logarithmic or model transformed is the specification entering the linear regression equations, except for operational cycle. As can be seen, the majority of the variables are "well behaved", with roughly symmetric distributions, and with very few outlying observations of the sort likely to cause estimation problems. Considering only the specification entering the linear regression equations, the only great exceptions in terms of symmetry appear to be the measures of business risk and operational cycle that are respectively negatively skewed and positively skewed. The original specification of the measure of business risk is much nearer the normal distribution but the logarithmic one is used in the regression analyses because it obtains results that are a little more satisfactory. The use of this logarithmic specification implies that the effect of risk is the greater the lower the firm finds itself in the risk scale. As to the measure of operational cycle, the logarithmic scale is much nearer the normal distribution, but the original is used for two reasons. First, its use seems to be more logical because there is no reason to believe that the strength of the impact of operational cycle should not be the same all across its scale. Second, it obtains results that are a little more satisfactory.

The logarithmic scales of the measures of size and age have more symmetric distributions and work much better than the original ones. Therefore, they are the preferred ones. Furthermore, the literature

suggests that these two variables, as measures of risk, should not have as a rule a linear effect on variables dependent on them. The logarithmic scale of the measure of asset composition, not shown in Table I, has a distribution much nearer the normal one than its original specification. However, the original specification produces results that are much more satisfactory. Consequently, preference is given to it. Besides, it seems much more reasonable that the impact of asset composition in decreasing the relative use of credit should maintain itself constant all across rather than decrease as higher values on its scale are observed. This belief

Table I
Summary Statistics of Variables

Financial Leverage (FL): (Total debt/Total assets); Model-transformed Dependent Variable: LN{(FL)/[1-(FL)]}; Business Risk: Sales Variability; Size: employment level; Asset Composition: (Long-term assets/Total assets); Profitability: perceptual scale; Growth: growth in employment level; Industry: 0 if furniture, 1 if food, and 2 if clothing; Age: number of years since establishment; Operational Cycle: average inventory age + average receivables collection period; Entrepreneur's Risk Tolerance: perceptual scale; Inflation: 0 if years 1987-88 or 1990-92, 1 if 1989.

Variables	Version	Mean	Standard Deviation	Minimum	Maximum	Fractiles			Kurtosis	Skew-ness
						0.10	0.50	0.90		
Dependent Variable	Financial Leverage	0.33	0.20	0.02	0.88	0.10	0.29	0.59	-0.18	0.64
	Model-transformed	-0.88	1.07	-3.74	2.02	-2.25	-0.88	0.35	0.14	-0.04
Business Risk	Original	0.52	0.25	0.01	1.20	0.18	0.53	0.83	-0.30	0.09
	Logarithmic	-0.37	0.35	-2.00	0.08	-0.76	-0.28	-0.08	8.08	-2.49
Size	Original	57.20	35.52	12.00	140.00	23.20	48.00	124.20	-0.25	0.83
	Logarithmic	1.67	0.28	1.08	2.15	1.37	1.68	2.09	-0.87	-0.13
Asset Composition	Original	0.34	0.24	0.02	0.96	0.08	0.26	0.75	-0.42	0.82
Profitability	Original	3.20	1.58	0.00	5.00	1.00	3.00	5.00	-0.70	-0.41
Growth	Original	6.43	18.07	-44.30	62.40	-13.10	5.50	30.72	1.37	0.87
Industry	Original	1.43	0.76	0.00	2.00	0.00	2.00	2.00	-0.67	-0.91
Age	Original	18.22	11.76	2.00	59.00	7.00	15.00	35.80	2.60	1.55
	Logarithmic	1.18	0.27	0.30	1.77	0.85	1.18	1.55	0.18	-0.18
Operational Cycle	Original	101.33	46.83	24.00	235.00	53.40	89.00	190.00	1.44	1.38
	Logarithmic	1.97	0.19	1.38	2.37	1.73	1.95	2.28	0.96	0.04
Entrepreneur's Risk Tolerance	Original	2.59	1.30	1.00	5.00	1.00	3.00	5.00	-0.70	0.39
Inflation	Original	0.29	0.47	0.00	1.00	0.00	0.00	1.00	-1.17	0.92

Obs.: 1) Number of cases: 123; 2) If shown, the logarithmic or model transformed has been the version entering the linear regression equations, except for Operational Cycle.

rests on the fact that values on the scale of asset composition are restricted to the interval 0 to 1, not taking disparate values as in the scale of size, for example. The related literature seems to be silent as to this aspect of the behavior of asset composition.

The original scale of the measure of growth is the one that fits best the data, no matter the nature of the many different ones that are tentatively used. The measures of the variables entrepreneur's risk tolerance, inflation, industry and profitability have all peculiar scales described in the part on methodology and are listed in Table I mostly for the sake of completeness. However, more or less the same that happens to the measure of growth happens to the scales of these four variables.

The distribution of the model-transformed dependent variable is, out of all distributions generated by the work, the nearest the normal distribution. As already noted, the linear transformation of the adopted mathematical model changes the distribution of the measure of the dependent variable in such a way to correct for violations of the assumptions underlying the model of linear regression analysis. From Table I, it can be seen that the mathematical model transformed dependent variable is more symmetric than the original specification. Besides, the original one will never be normal, since its values are on one side logically and on the other commercially restricted to a finite range, that is, they must fall between 0 and 1. The transformed one is not subjected on precision terms to such restriction.

Finally, outliers seem to be more of a problem in the logarithmic scale of the measure of business risk and in the original scales of the measures of operational cycle and growth. For both business risk and operational cycle, two facts prove that results are not to any expressive extent influenced by extreme cases. The two facts are that the alternative scales to the used ones do not have the problem of outliers and that they work in the regression equations with almost the same efficiency as the used ones. Specifically for operational cycle, the problem in fact has been pre-empted during the work of coding the questionnaire answers when the averages for the industries have replaced two extreme, totally unreasonable, values. As to the measure of growth, removing the two outliers from the data set leaves the results almost unchanged in terms of statistics that measure the strength of relationships. Significance levels, however, show a non-trivial fall by force of the small size of the sample.

B. CORRELATIONS AMONG THE INDEPENDENT VARIABLES

Table II below exhibits the Pearson simple correlation coefficients between the measures of the variables of the study. Each correlation coefficient for each pair of variables is the highest that obtains from all the possible combinations of the specifications shown in Table I. No shortcomings of this way of reporting results are anticipated since differences in relation to other ways are not relevant. Correlation coefficients for the model-transformed independent variable are not exhibited.

Table II
Intercorrelation Matrix

Financial Leverage (FL): (Total debt/Total assets); Asset Composition: (Long-term assets/Total assets); Operational Cycle: average inventory age + average receivables collection period; Size: employment level; Business Risk: Sales Variability; Growth: growth in employment level; Entrepreneur's Risk Tolerance: perceptual scale; Industry: 0 if furniture, 1 if food, and 2 if clothing; Age: number of years since establishment; Profitability: perceptual scale; Inflation: 0 if years 1987-88 or 1990-92, 1 if 1989.

	Financial Leverage	Asset Compo-sition	Opera-tional Cycle	Size	Business Risk	Growth	Entrepre-neur's Risk Tolerance	Industry	Age	Profit-ability
Financial Leverage	—	-0.4930 S=0.001	0.3906 S=0.006	0.3767 S=0.008	-0.3731 S=0.008	0.3142 S=0.023	0.1910 S=0.116	0.1831 S=0.126	-0.1410 S=0.190	0.0364 S=0.411
Asset Composition	-0.3749 S=0.000	—	-0.2006 S=0.104	-0.1685 S=0.146	0.2213 S=0.082	-0.1985 S=0.107	0.0440 S=0.392	-0.5287 S=0.000	0.4208 S=0.003	-0.0972 S=0.273
Operational Cycle	0.2189 S=0.008	-0.1596 S=0.039	—	-0.1186 S=0.230	-0.0619 S=0.350	0.1295 S=0.210	-0.1904 S=0.117	0.1264 S=0.215	0.2259 S=0.078	0.1230 S=0.222
Size	0.3262 S=0.000	-01521 S=0.047	-0.1394 S=0.062	—	-0.2970 S=0.030	0.0303 S=0.425	0.0479 S=0.383	0.2121 S=0.092	-0.1288 S=0.211	0.1484 S=0.177
Business Risk	-0.2461 S=0.003	0.1429 S=0.057	-0.0415 S=0.324	-0.2793 S=0.001	—	0.1194 S=0.229	0.0751 S=0.320	0.0446 S=0.391	-0.2772 S=0.040	-0.1859 S=0.122
Growth	0.2255 S=0.006	-0.1895 S=0.018	0.0892 S=0.163	0.0127 S=0.445	0.1391 S=0.062	—	0.2553 S=0.054	0.1950 S=0.111	-0.2467 S=0.060	0.3297 S=0.018
Entrepreneur's Risk Tolerance	0.1040 S=0.126	0.1492 S=0.050	-0.1632 S=0.036	-0.0367 S=0.344	0.1211 S=0.091	0.2819 S=0.001	—	0.2248 S=0.079	-0.1830 S=0.126	-0.0926 S=0.282
Industry	0.1022 S=0.130	-0.4970 S=0.000	0.1616 S=0.037	0.1782 S=0.024	0.1166 S=0.099	0.1362 S=0.067	0.1044 S=0.125	—	-0.5066 S=0.001	-0.0180 S=0.456
Age	-0.1580 S=0.040	0.3969 S=0.000	0.1411 S=0.060	-0.2176 S=0.008	-0.3284 S=0.000	-0.4055 S=0.000	-0.1559 S=0.043	-0.4988 S=0.000	—	0.0359 S=0.412
Profitability	0.0190 S=0.418	-0.1536 S=0.045	0.1546 S=0.044	0.1135 S=0.106	-0.1634 S=0.035	0.2296 S=0.005	-0.1171 S=0.099	0.0388 S=0.335	-0.0664 S=0.233	—
Inflation	-0.1650 S=0.034	-0.0060 S=0.472	0.0150 S=0.433	-0.0510 S=0.288	-0.0380 S=0.336	0.0160 S=0.429	-0.0190 S=0.418	-0.0360 S=0.347	0.0290 S=0.375	0.0450 S=0.310

Obs.: 1) Upper Triangle: variables entering the time-series-average cross-sectional regression / Lower Triangle: variables entering the pooled time-series cross-sectional regressions; 2) Number of cases: 41 and 123 respectively for time-series-average and pooled time-series cross-sectional regressions.

The coefficients on both the financial leverage column and row confirm more than half of the expected associations between the independent variables and the dependent variable, at highly significant levels and in the expected directions. However, since regression analysis is a much more powerful analytic instrument than single correlation analysis, complete discussion of the financial leverage column and row is left for the next section. It seems more appropriate for this moment to discuss the results shown on the intercorrelation matrix having as the focus the question of validating the research main findings. In this respect, the correlation coefficients between asset composition and size, at first glance, seem to stand out as a shortcoming facing validation arguments. On the one hand, asset composition may be seen as a measure of capital intensity and capital intensity, because of indivisibility of capital, may mean more often than not bigness. On the other hand, the correlation coefficients between asset composition and size are too low, statistically non-significant in one case, and, worse of all, negative. However, there is an explanation for this apparent contradiction and this is that the measure of size is based on employment level and this has much more to do with labor-intensity, which is opposite to capital intensity. Consequently, higher levels of employment would be, at least in the case of very small, labor-intensive enterprises, associated with low fixed to total assets ratios.

The low, statistically non-significant in one case, and negative correlation coefficients between size and age also seem to work against validation arguments. It is intuitive that firms grow as they age. The explanation here is twofold. First, the fact that size is measured in terms of employment levels once more influences the results, since when total assets replace number of employees the correlation coefficients become positive, higher and statistically significant. Second, age has a relatively high positive correlation with asset composition and, as already seen in the previous paragraph, the direction of the relationship between size and asset composition is inverse. Thus, it may be that asset composition is working indirectly through age. This relatively high correlation between asset composition and age poses even greater difficulties, which will be better addressed in the next section.

Another finding that seems to work against validation is the sign of the correlation coefficients between business risk and profitability. Only higher profitability would drive enterprises into operating in riskier environments. Explaining this contrary to expected result here is made difficult by the fact that data on other determinants of profitability have not been collected. Without controlling for them it is not possible to assess whether or not it is the case of a spurious correlation. Besides, it may be the case of a temporary situation captured by the research because of its short time span.

The total absence of correlation between business risk and growth appears to be a little puzzling. Since, whatever the way instability is measured, there is always the danger that continuous variations in size in only one direction may mistakenly be assessed as instability, it may be expected at least a small spurious correlation between the variables. Besides, as seen in the part on review of literature, there is the belief that growing business sectors are unstable. In this study, the measure of growth is based upon employment levels and that of instability on annual sales levels, and this use of different basic variables may explain the absence of a spurious correlation between business risk and growth. As to unstable growing business sectors, there is a tendency for industry to correlate positively with growth, according to Table II, although the respective coefficients are not statistically significant. This would seem to be in agreement with the referred belief in view of the fact that dress fashion would seem to be more volatile than consumer tastes for food and this in turn to be more changeable than furniture styling. However, what may be true for sectors does not have necessarily to be true at the enterprise level.

Table II shows another pair of figures that could be seen as another puzzling absence of association. These are the correlation coefficients for the measures of the variables industry and business risk. Fortunately, the puzzle is only apparent, as it will be possible to clear it up in the next section by means of the use of the more powerful multivariate regression analysis.

Many correlation coefficients in Table II, because they confirm relationships that may be expected, run in favor of validation. The relatively high correlation coefficients between, on the one hand, asset composition and, on the other hand, age and industry are good examples. It seems intuitive to expect and it is part of the theory of firm development that as enterprises grow and mature they tend to become more mechanized, automated, capital intensive. In addition, it is well known that industries differ with relation to varying aspects, being one of them the level of capital intensity. Thus, the existence of such associations between those variables in this very small firms sample is not surprising. The effects of the degrees of

volatility of dress fashion, consumer tastes for food flavors and consumer preferences for furniture styles on the extent that product standardization is possible certainly determine the nature and strength of the observed relationships. Dress fashion probably makes standardization more difficult in the clothing industry than consumer tastes for food flavors do in the food-manufacturing sector. In turn, consumer tastes for food flavors probably make standardization more difficult in the food-manufacturing sector than consumer preferences for furniture styles do in the furniture-making industry. Mechanization, automation and capital-intensity are only feasible if, and to the extent that, standardization is possible. Putting together these realizations explains why the furniture sector has in relative terms more fixed assets than the food sector and this in turn more than the clothing one.

The signs of the correlation coefficients between, on one side, size and, on the other side, industry and age are probably due to the same effects as those discussed in the previous paragraph. The measure of size in this study tends to be also a measure of the level of labor-intensity and the clothing industry tends to be more labor intensive than the food industry and this one more than the furniture one. Hence, the positive sign. Age is, as already seen, positively correlated with asset composition, which is a measure of capital-intensity. As the measure of size tends to be also a measure of labor-intensity, it is only natural that the sign of the correlation coefficients between age and size be negative. These correlation coefficients are not statistically significant for the time-series-average cross-sectional data, though.

As shown in the part on review of literature, it is widely believed that operational stability increases with size. This is confirmed by the correlation coefficients between the measure of size and that of business risk. They are negative and statistically significant. It is also believed, as shown by the review of literature, that operational stability increases with age. This tends to be confirmed by the negative, statistically significant correlation coefficients between the measures of business risk and age. These are two more findings that strongly support the arguments of validation of research methodology and results.

Three pairs of correlation coefficients of the growth measure may be brought into the discussion in order to reinforce validation. The most important of them are the relatively high, positive and statistically significant correlation coefficients with the measure of profitability. It seems intuitive to expect and correct in economics to believe that few other things, besides higher profitability, would make firms to pursue higher growth rates. Hence, the importance of this research finding. It seems also intuitive to expect that higher growth rates should be pursued by entrepreneurs with higher risk-taking propensity. The correlation coefficients between the measures of growth and entrepreneur's risk tolerance seem to confirm this tendency, since they are positive and statistically significant. Last, it seems reasonable to expect that older enterprises grow more slowly. It is intuitive to think that older enterprises are more traditional and because of this are not so eager in searching for new opportunities that probably more often than not imply growth if advantage is taken of them. The negative, moderate and almost statistically significant correlation coefficients between the measures of age and growth shown on Table II come some way towards confirming this reasoning.

Two more pairs of correlation coefficients with the measure of entrepreneur's risk tolerance can be taken as evidence, although not strong, in favor of validation. It appears a sound idea that entrepreneurs with low levels of risk aversion should be found more often than not in stable trades. This is exactly the meaning of the positive sign of the correlation coefficients between the measures of entrepreneur's risk tolerance and industry. It seems reasonable to think that dress fashion is more volatile than consumer tastes for food flavors and that consumer tastes for food, in turn, is more volatile than consumer preferences for furniture styles. This sequence in volatility levels would make the clothing sector more unstable than the food sector and the food sector, in turn, more unstable than the furniture sector. Likewise, it appears to be another sound idea that the same kind of entrepreneurs should be found more often than not in younger small firms than in their older, traditional counterparts. This is precisely the interpretation of the negative sign of the correlation coefficients between the variables age and entrepreneur's risk tolerance.

The final considerations go to the correlation coefficients between the measures of industry and age. They are relatively sizeable, negative and highly statistically significant. Besides, they seem to make much sense, if it is realized that mortality rates amongst very small businesses should be higher in trades more prone to instability. However, it cannot be said that this finding is strong evidence in favor of validation of results and methodology. This is because measurement of these two variables appears to be a relatively straightforward task, in the sense that there cannot be much room for errors in building scales and

ascribing values to enterprises. On the other hand, were the finding opposite, that is, positive signed coefficients, then it would really be strong evidence, but against validation.

C. REGRESSION RESULTS

Table III below reports the results of the time-series-average cross-sectional and pooled time-series cross-sectional regressions of firm leverage ratios on their hypothesized determinants. Findings from the regression equations as a whole are dealt with first. Findings related to the independent variables individually are addressed next. For the sake of clarity, discussion on results on each of the studied independent variables is presented separately under the respective heading. Independent variables are displayed from top to bottom in the column of main regression equation (1) in a decreasing order of relative

Table III
Determinants of Financial Leverage

Financial Leverage (FL): (Total debt/Total assets); Model-transformed Dependent Variable: LN{(FL)/[1-(FL)]}; Asset Composition: (Long-term assets/Total assets); Operational Cycle: average inventory age + average receivables collection period; Size: Log_{10} of employment level; Industry: 0 if furniture, 1 if food, and 2 if clothing; Profitability: perceptual scale; Entrepreneur's Risk Tolerance: perceptual scale; Growth: growth in employment level; Business Risk: Log_{10} of Sales Variability; Inflation: 0 if years 1987-88 or 1990-92, 1 if 1989; Age: Log_{10} of number of years since establishment.

Regressors/ Independent Variables	Expected Sign	Main Cross-Sectional Regression Equations		Auxiliary Pooled Time-Series Cross-Sectional Regression Equations			
		Time-Series-Average	Pooled Time-Series				
		(1)	(2)	(3)	(4)	(5)	(6)
Constant	-	-2.182 (-3.41)***	-2.732 (-4.66)***	-3.112 (-5.31)***	-0.569 (-1.33)	-2.377 (-3.10)**	-2.667 (-3.26)***
Asset Composition	-	-1.871[1] (-3.96)***	-1.838[1] (-4.55)***	-1.259[2] (-3.55)***	-1.855[1] (-4.18)***	-1.758[1] (-4.19)***	
Operational Cycle	+	0.007[2] (3.49)***	0.006[3] (3.41)***	0.005[3] (2.94)**	0.005[2] (2.68)**	0.006[3] (3.46)***	0.006[3] (3.13)**
Size	+	0.967[3] (3.13)**	1.362[2] (4.93)***	1.259[1] (4.47)***		1.343[2] (4.82)***	1.322[1] (4.43)***
Industry		-0.280[4] (-2.07)*	-0.336[4] (-2.75)**		-0.254[5] (-1.91)*	-0.365[4] (-2.83)**	-0.153[8] (-1.20)
Profitability	-	-0.110[5] (-1.86)*	-0.125[7] (-2.39)**	-0.120[6] (-2.24)*	-0.097[7] (-1.70)*	-0.125[6] (-2.39)**	-0.116[6] (-2.06)*
Entrepreneur's Risk Tolerance	+	0.130[6] (1.75)*	0.122[9] (1.85)*	0.081[8] (1.22)	0.113[8] (1.56)	0.118[9] (1.77)*	0.036[9] (0.52)
Growth	+	0.009[7] (1.80)*	0.011[6] (2.36)*	0.012[5] (2.38)**	0.011[4] (2.07)*	0.010[7] (2.01)*	0.012[4] (2.34)*
Business Risk	-	-0.428[8] (-1.93)*	-0.577[5] (-2.52)**	-0.665[4] (-2.85)**	-0.667[3] (-2.66)**	-0.644[5] (-2.60)**	-0.931[2] (-3.66)***
Inflation	-		-0.351[8] (-2.09)*	-0.336[7] (-1.95)*	-0.391[6] (-2.13)*	-0.349[8] (-2.08)*	-0.337[7] (-1.87)*
Age	+					-0.276[10] (-0.72)	-0.700[5] (-1.76)*
Linear Equation R^2		0.65	0.42	0.39	0.30	0.43	0.34
Non-linear Equation R^2		0.68	0.43	0.40	0.31	0.43	0.32
Regression F		7.35***	9.25***	8.95***	6.12***	8.34***	6.39***
Nº. of Obs.		41	123	123	123	123	123

Obs: 1) First values in the main body of the table are coefficient estimates; 2) numbers in parentheses are t-statistics; 3) numbers in brackets give the relative importance of the variables in a decreasing order; 4) *, **, and *** denote statistical significance in one-tailed tests, at the 5%, 1%, and 0,1% levels, respectively.

economic importance.

The marginal effects of an independent variable upon the dependent variable are given by the formula:

$$\frac{\partial Y}{\partial X} = \frac{1}{1+e^{-(a+\Sigma b_i X_i)}} \frac{1}{1+e^{(a+\Sigma b_i X_i)}} b_i, \quad (7)$$

which is derived from equation (4). The only thing that changes in the formula when evaluation goes from a specific independent variable to another one is the b_i that multiplies the fractions on the right side of the equality. Consequently, the relative economic importance of the independent variables would be given by the magnitudes of their estimated coefficients if they represented phenomena measured in scales that were directly comparable. The solution to overcome this comparability difficulty is a conventional one. Accordingly, the estimated coefficients are multiplied by the standard deviations of the respective variable measures. This is the way the relative economic importance of each explanatory variable reported in Table III is calculated. Absolute economic importance is given by the whole marginal effects, which, according to equation (7), depend on all of the data in a nonlinear manner. This makes interpretation difficult. Although the solution to overcome this interpretation difficulty may be flawed, the marginal effects of the independent variables are assessed at the point of the sample mean for financial leverage, that is, 0.33, as Table I shows. This sample mean substitutes for the first fraction on the right side of equation (7).

Regression equations (1) and (2), the main equations, are the best ever fitted and they may be taken as self-explaining. However, it appears worthwhile commenting upon the regression results as they reveal a number of issues for consideration. It is important to notice that amazingly almost seventy percent of the cross-sectional variation in debt ratios is explained by the included independent variables in regression equation number (1). Two implications of this result must be addressed at this point. The first one is that the widespread belief that small firms' accounting statements cannot be taken seriously whatever the use to be made of them should perhaps be rethought. This is certainly true for the balance sheets in view of the extensive use made of them in this research. It may be that for reasons worthy pondering about, or even researching on, profit and loss accounts are more prone to be flawed. Profit and loss accounts are a very important taxable base, a fact that may explain, as seen in the section on variable measurement, this higher tendency to be flawed. However, sales volume, which is the first and a most important item in profit and loss accounts, is used in this research for generating the measure of business risk and positive results are obtained from it. The fact that even a profit and loss account item challenges the above-referred general pessimistic belief leads to a very possible explanation for the satisfactory results obtained from the small firms' accounting statements. This is that undervaluing of accounting items for tax evasion perhaps happens to be more or less proportional across these items and across time and, as they are used in this research only as ratios, biases on results are minimized. The second implication is that the amazingly almost seventy percent of the cross-sectional variation in debt ratios being explained in regression equation number (1) is in total disagreement with many authors of studies on the determinants of financial leverage. For example, Kim and Sorensen (1986 p.138) concluded that debt decision was largely determined non-systematically by the managers across firms. Aggravating the inconsistency, there is the fact that the present research works with very small enterprises, within which decision-making is widely thought to be totally non-systematical. The fact that this research works with so many more independent variables into just one equation than any other work of the kind may be one of the reasons for obtaining such high econometric explaining of the dependent variable.

A second amazing result shown in regression equations (1) and (2) is that all the coefficients of all included independent variables and the constant are statistically significant at better than the conventional level of 5%. Besides, the signs of all coefficients are in accordance with expectations, which just follow in many cases the mainstream in the related literature. Moreover, the full equation is highly significant too. No other researcher has achieved so much and the explanation may be the same as the one given in the previous paragraph. Many authors have ascribed reaching inconsistent, bad or no results at all to missing variables in the equations regressed in their works.

A third amazing result concerns what the traditional theory of finance predicts as compared with what is obtained from regression equations (1) and (2). According to Shyam-Sunder and Myers (1999 p.

220), it predicts a cross-sectional relation between average debt ratios and many characteristics of the firm. Thus, the fact that a much higher R^2 coefficient is obtained with the time-series-average cross-sectional regression than with the pooled times-series cross-sectional one seems to be very suggestive of the meaning of the results obtained. This better fit with average debt ratios, as opposed to single-period debt ratios, would be one implication from another prediction of the traditional theory of finance, that is, reversion of the actual debt ratios towards a target or optimum. Results consistent with theory predictions augment research validity. This belief sustains even in face of Shyam-Sunder and Myers' argument that the statistical power of some usual tests of the optimal capital structure theory is virtually nil. These authors themselves made reservations to their own work and their work does not seem to have been yet analyzed by other researchers.

C.1. ASSET COMPOSITION

According to regression equations (1) and (2), asset composition is by far the most important of all determinants of financial leverage. This is in keeping with its position as measured by the simple correlation coefficients, according to Table II. Asset composition is very important in absolute terms too, since one standard deviation increase in it causes a very near 0.10 decrease in financial leverage to happen, according to the variable coefficient estimate given by main regression equation number (2). Taking into consideration that the sample mean for financial leverage is 0.33, this very near 0.10 decrease represents a 30% variation.

Titman and Wessels (1988 p.15) in a section on robustness called attention to the scaling of variables and to the possibility that findings might be more the result of common denominators than a reflection of a true relationship. They called for caution specially when interpreting variables scaled by operating income positively correlated with debt ratios and to a lesser extent variables scaled by total assets negatively related to the debt ratios. They asserted that the large simple correlation coefficient between their operating income over total assets and non-debt tax shields over total assets variables of r=0.31 was caused by their common denominators. In face of this, asset composition and financial leverage, which are in this study the only two measures scaled by the same variable, are tested to check whether theirs is or is not the case. A new variable is created for the time-series-average cross-sectional data set by replacing all the values which enter the computation of the numerator of asset composition by a constant, leaving total assets, the denominator, the only thing to vary. The simple correlation coefficient of this new variable with financial leverage is r=-0.04 with s=0.41. Such a practically nonexistent correlation proves that the corresponding correlation coefficients shown on Table II and the results attained in the various regression equations shown on Table III are not reflections of asset composition and financial leverage having common denominators. Thus the test not only refutes the above authors' hypothesis for this sample but also improves validation of variable measurement choices and results of this work.

It is too comfortable that the study results on the relationship between asset composition and financial leverage turn to happen in agreement with what according to Ferri and Jones (1979 p.643) the financial theory would suggest. For this not only lends support to a literature line of thought but also helps to validate the results themselves and the adopted methodology. Many scholars think that, since long-term assets over total assets would measure operating risk in an increasing scale, it should have a negative impact on total debt ratio, which measures financial risk in an increasing scale too. The strong negative association found in this study is also in agreement with findings of previous empirical research works, many of which have been reviewed in the literature section.

The results with the variable asset composition are also in agreement with expectations established in the beginning of this research report for a very small firms sample. Most important of all is that they are in agreement with the idea conveyed by Binks (1979) that a higher proportion of fixed assets does not mean higher capacity to collateralize debt. Very small firms are urged to start acquiring plant and equipment well before they are able to begin buying property, and plant and equipment are often considered unacceptable as viable security. Besides not having the effect of raising debt level via collateralization, a higher proportion of fixed assets leads to the use of less debt financing in relative terms. The reason for this is that the proportion of fixed assets is a measure of capital intensity and so the higher it is, the higher operating risk is, as seen on the part on review of literature. These are the implications for the technological modernization of very small firms.

C.2. OPERATIONAL CYCLE

Operational cycle is the second most important determinant of financial leverage in regression equation number (1) and the third in regression equation number (2). It is interesting to note that it interchanges the 2nd and 3rd ranks with size. Even more interesting is the fact that, although the reasons for including both variables in the study are the same, as seen in the part on review of literature, they enter the same equations without "troubling" one another. Longer operational cycles are associated with higher financial leverage, as expected.

Comparing regression equation number (4) with regression equation number (2) allows verifying the effects of introducing size into the regression equation, since the only difference between the two regression equations is the absence and presence of this variable. As far as operational cycle is concerned, this inclusion causes an overall improvement. The same happens to size when operational cycle is introduced into the regression equation, although this is not possible to see from Table III. The implication of these two findings is that these two variables do not seem to capture the same effects on financial leverage. Moreover, it is not possible from the research to gain any insight into this, since the introduction of operational cycle into the regression equation causes an improvement for all the other variables.

The foregoing has a very important implication, that is, as operational cycle does not capture the same effects as size, there is no theory that backs its inclusion in the study. However, excluding it from the main regression equations makes half of the other variables statistically insignificant. Consequently, it appears that the best decision is to keep the variable operational cycle in the equations in the hope that it is a true determinant of financial leverage. Future research on small business finance is left with the task of searching for theoretical and empirical explanations for the relationship observed in this study. It is hoped that a proposition made in the section on review of literature will be of help in this search. Recalling, this proposition is that, because the reality of small firms is relatively to that of larger firms more characterized by short-term phenomena, it is better captured by the variable operational cycle than by the variable size measured in conventional ways. A fact to be described in the next part of this work seems to make this proposition less speculative and more real. Such a fact is that operational cycle becomes in the cross-sectional regression the most important of all variables explaining own working capital, which is a financial risk measure perhaps much more important for small firms than financial leverage.

C.3. SIZE

Size is the third most important determinant of financial leverage according to regression equation number (1) and the second according to regression equation number (2) in Table III. One standard deviation increase in size causes an over 0.08 increase in financial leverage to happen, according to regression equation number (2). Size attains high significance in all regression equations. Larger enterprises tend to have higher total debt ratios. The results with the variable size are in keeping with the more numerous and more convincing arguments in the theoretical literature that posit a direct relationship with financial leverage. As seen in the part on review of literature, empirical works on the relationship between size and financial leverage are quite varying with respect to conclusions. Many researchers have found no relationship and few have found an inverse association. It is hoped that the strong evidence from this work helps to conciliate the empirical literature diverging findings. Hope rests upon the fact that it is in line with the argument that studies that find no relationship are the ones that include only very large enterprises in their samples. Expectations set for a very small firms sample are also fulfilled by the results attained with the size variable.

As seen in the part of this work on review of literature, size, like industry classification, is viewed as a proxy for business risk. However, this contrasts with the conclusion by Rajan and Zingales (1995 p.1457) that why size is correlated with leverage is not yet really understood. Regression equation number (4) is shown on Table III only to test the hypothesis that the variable size proxies for business risk. Comparing regression equation number (4) with regression equation number (2) allows verifying the effects of introducing size into the regression equation, since the only difference between the two regression equations is the absence and presence of that variable. An inspection of the t statistic for each variable reveals that from regression equation number (4) to regression equation number (2) they all are improved with only two exceptions. The first exception is business risk, which interestingly has its t statistic worsened and loses its third position in importance to operational cycle. This means that the size variable robs

explanation power from the business risk variable, most probably because they to some extent convey the same influence on financial leverage. This is so despite the fact that, according to Table II, they are not highly correlated with each other. So, the hypothesis is supported by the analyses and variable behavior in accordance with predictions in the literature serves to validate the choices of measures adopted in this study. This applies to both variables, that is, size and business risk.

The second exception to the general result of the experiment above is supportive of the hypothesis that size proxies for business risk too, but in this case explaining is made much more difficult. Inflation is this second exception and its t statistic is worsened alike. This means again that the size variable robs explanation power from the other independent variable, but in this case not because they to some extent convey the same influence on financial leverage. It is more probable that the reason is that the variable size buffers to some extent the impact of inflation on financial leverage. Running the same regression equation on both subsamples for the dummy variable gives the result that the coefficient for the business risk variable is far more negative and significant for the subsample that corresponds to the time when inflation is very high (Coef.: -0.437, t statistic: -1.508, for inflation = 0 and coef.: -1.090, t statistic: -3.212, for inflation = 1). This means that business risk has a greater impact on financial leverage when inflation is high. Most probably this is so because, as will be seen in the Subsection C.9, the measures of inflation and general economic conditions are highly correlated with each other in this research, high inflation being associated with high economic depression. As general economic conditions can be seen as a background where business risk takes place and exerts its influence upon financial leverage, the strength of business risk as a determinant of financial leverage depends upon the particular level assumed by economic activity. But, in turn, the strength of economic activity is buffered to some extent by size. This is coherent with the finding by Ferri and Jones (1979 p.640) and by previous studies referred to by them that in expansions even marginal firms have ready access to debt capital, but, in recessions the established firms that have both a record of past success and relatively good performance obtain a large percentage of the new debt. The buffering of the impact of inflation upon financial leverage by size turns to be the buffering of the impact of the variable business risk on financial leverage by size.

C.4. INDUSTRY

Industry is the fourth most important determinant of financial leverage as indicated by both main regression equations in Table III. As measured by the simple correlation coefficients, according to Table II, it is only the seventh most important correlate of financial leverage. Besides, the simple correlation coefficients of industry with financial leverage are statistically non-significant and positive, possibly influenced by the variables asset composition and age, which are negatively correlated with both financial leverage and industry. The reversal of sign and upgrading in importance shown in regression equations (1) and (2) must be the result of important forces acting through industry. Perhaps only profound technical and commercial knowledge of the three trades considered would help to identify the forces at work when the industry variable changes from the furniture manufacturing sector to the food one and from this to the clothing. The reviewed related literature, as seen in the respective section, points to some possible forces, being business risk the most important. Related to this, there are the phenomena of dress fashion, consumer tastes for food flavors and consumer preferences for furniture styles, already discussed in the section on correlations among the variables. It seems reasonable to think that dress fashion is more volatile than consumer tastes for food flavors and that consumer tastes for food flavors, in turn, is more volatile than consumer preferences for furniture styles. This sequence in volatility levels would make the clothing sector riskier than the food sector and the food sector, in turn, riskier than the furniture sector. If this is really so, then the observed negative relationship between the variables industry and financial leverage may be explained in this way.

Regression equation number (3) is shown only for the analysis of the behavior of the industry variable and helping with the discussion of the interpretation problem begun in the previous paragraph. Comparing regression equation number (3) with regression equation number (2) allows verifying the effects of introducing industry into the regression equation, since the only difference between the two equations is the absence and presence of this variable. An inspection of the t statistic for each variable reveals that from regression equation number (3) to regression equation number (2) there happens a worsening in only in one case for all practical purposes[8]. Interestingly, it is the t statistic for business risk that is worsened and , as a

[8] When this exercise is carried out with the time-series-average cross-sectional data set the t statistic for the growth variable coefficient is improved like those for the other variables' coefficients.

consequence, this variable loses its fourth position in importance to industry. This means that the industry variable robs explanation power from the business risk variable, most probably because they to some extent convey the same influence on financial leverage. Still more interesting is that the phenomenon takes place despite the fact that, according to Table II, industry and business risk are not correlated with each other at all. This finding is a very important one for at least two reasons. First, it lends support to the reasoning in the previous paragraph. Second, as seen in the section on review of literature, there has been some questioning whether the results shown by some researchers really mean that what is acting through industry classification is risk or something else. The relevance of this point is that in the positive case the results obtained by these authors would support the theory of optimal capital structure. Thus, the results of the research being reported here seem not only to support the hypothesized relationship but also the thesis that risk is represented by the industry variable, at least as part of what this variable represents. This is a point not addressed empirically by authors studying financial leverage up to now, although heavily urged to do so by criticisms put forward by opponents to the belief that industry determines financial leverage. To this author's knowledge, before this work only Kim and others (1998 p.352) found that industry classification subsumed much of the effect of the firm level business risk measure. However, theirs was a study on the determinants of corporate liquidity rather than financial leverage and their measure of business risk was cash flow uncertainty rather than sales variability.

Splitting the sample into three subsamples according to the manufacturing sectors studied and running the same regression equation shows that an apparently contradictory, though interesting, result takes place. In all subsamples the coefficient for the business risk measure is significant and negative. The apparently contradictory aspect of it is that it is the most negative for the furniture-manufacturing sector and the least for the clothing one. It would be more logical to expect the inverse to happen, since, according to previous discussion, business risk would be the highest in the clothing-manufacturing sector and the lowest in the furniture one. The interesting aspect of it is that it accords with the idea conveyed by the concept of operational leverage. The furniture-manufacturing sector is where the magnifying effect upon variability of sales, known as operational leverage, can be the strongest, for it is in this sector that the investment in fixed assets is normally the highest. The opposite would be true for the clothing-manufacturing sector. The existence of the phenomenon of operational leverage is dependent upon the existence of fixed costs and is the stronger the higher these costs are. Fixed costs are generally associated with employment of fixed assets. Splitting the sample on the median value of the asset composition variable confirms this reasoning. The coefficient of the business risk measure is significant and negative on both halves of the sample, but it is more negative for the sample half with the highest values for the asset composition variable.

Results in Table III do not seem to authorize use of the findings related to the relationship between industry and financial leverage as evidence that supports the proposition that non-debt tax shields have a negative impact on financial leverage. This can verified by observing the behavior of the variable asset composition, which could be taken as a measure of non-debt tax shields because most likely depreciation is the higher the higher the value of asset composition. Asset composition does not experience any decrease in its impact on financial leverage as the industry variable enters the multiple regression equation. On the contrary, a high increase is observed. However, DeAngelo and Masulis (1980 p.24), who made that use in relation to findings with industry prior to their work, assume that income tax is a most relevant aspect of corporate financial structure decisions. As already discussed, this is not the case for the very small firms sector.

Further analysis of the behavior of the industry variable provides additional evidence that supports the argument that this work produces much more results than others have produced because a larger number of independent variables are used. This additional evidence supports also the argument that multivariate analysis is perhaps the only adequate technique to investigate the determinants of financial leverage. In this sense, it is very suggestive that the industry variable shows power to explain variations in financial leverage so as to at the same time increment the R^2 statistic and hold its own significance high[9]. This happens even being industry respectively highly and moderately correlated with the variables asset composition and size, which on their turn are highly correlated with the dependent variable. The relevance of such an observation becomes patent when an analysis of the simple correlation coefficients shown on Table II is carried out against the regression results shown on Table III. First, it can be observed that the simple correlation coefficients between, on the one hand, asset composition and, on the other hand, financial leverage and

[9] When this exercise is carried out with the time-series-average cross-sectional data set, the difference in R^2 is even bigger.

industry are very high and those between industry and financial leverage are very low. Second, it could be concluded from this that no residual explaining power should be left for industry to additionally explain variations in financial leverage when introduced into the regression equation after asset composition having already been introduced. Third, the unexpected is, however, what happens. This can be seen through an inspection of regression equations (2) and (3) with a view to observing what changes from the latter, with asset composition already included and without industry, to the former, with both variables included.

The Pearson simple correlation coefficient is appropriate for data in which both the dependent and the independent variables are measured on an interval scale. According to Table II, the Pearson simple correlation coefficients between financial leverage and industry are low, insignificant and positive. The Eta coefficient, according to Norušis (1992 p.210), is appropriate for data in which the dependent variable is measured on an interval scale and the independent variable on a nominal or ordinal scale. Financial leverage and industry are measured respectively on an interval and nominal scales in this study. The Eta coefficient is equal to 0.21 for the time-series-average cross-sectional data set and 0.11 for the pooled time-series cross-sectional one (SPSS does not provide the significance level for this statistic). The Spearman correlation coefficient assesses the strength of the relationship when both variables are measured on ordinal scales. It is equal to 0.22 at the level of significance of 0.08 for the time-series-average cross-sectional and 0.12 at the level of significance of 0.10 for the pooled time-series cross-sectional data set. It should be stressed that like the Pearson ones these correlation coefficients are positive. Taken in isolation these results could lead to the conclusion that industry is not a determinant of financial leverage or that results from this sample could not be used as support for the thesis that it is. However, a totally different picture is depicted when the Pearson partial correlation coefficient is calculated controlling for all the other variables in regression equations (1) and (2). It is equal to -0.36 at the level of significance of 0.02 for the time-series-average and –0.22 at the level of significance of 0.01 for the pooled time-series cross-sectional data set. Such a finding is totally different also from that obtained by using bivariate analysis of variance. It is only unfortunate that a calculation controlling for other variables is not possible or available for the two non-parametric correlation coefficients above, since, if it were, the results would most probably corroborate even further the arguments put forward herein.

As it will be seen in the section on age, this variable hypothesized power of explaining variation in financial leverage is totally eliminated by the variable asset composition. Most probably, this happens because of the high correlation between the two independent variables and the high one between asset composition and financial leverage. The relationships between, on the one hand, industry and, on the other hand, asset composition and financial leverage are similar to those between, on the one hand, age and, on the other hand, asset composition and financial leverage. Despite this fact, industry does not suffer from the same interference. This is one more finding that lends support to the argument that industry determines financial leverage and that corroborates the methodology used in this work.

The findings with the variable industry in this study compare well also with those from past research in Brazil. Filardo (1980 p.71-7) studied financial leverage by means of the use of the ratio of financial expenditures to total sales. She found for the year 1972 the figures 0.0153, 0.0129 and 0.0127 for the furniture, food and clothing manufacturing sectors respectively, within the small and medium-size firms group. For the year 1975, the numbers were 0.0247, 0.0205 and 0.0188 for the food, furniture and clothing manufacturing sectors respectively. If it were not for the reversal of the positions of the furniture and food sectors in the year 1975, the sequence would be the same as that observed in this research. Account of the different ways of measuring financial leverage should be taken though.

Notwithstanding the foregoing, the evidence from Table III indicates that firm-specific characteristics are more important than industry-specific effects in explaining variation in financial leverage within the very small firms' segment. When the industry variable is introduced into the main regression equation number (2), with all the other variables already in, the R^2 statistic rises from 0.39 to 0.42. This change compares unfavorably with a rise from 0.30 to 0.42 caused by the introduction of size. It compares unfavorably with rises in the R^2 statistic caused by the introduction of other variables too. Thus, although not shown in Table III, the R^2 statistic changes from 0.32 and 0.37 to 0.42 when asset composition and operational cycle are in turn introduced into the regression equation, respectively. As to the remaining variables entering main regression equation number (2), changes in the R^2 statistic caused by their individual introduction are not expressively different from that caused by the individual introduction of industry. However, industry cannot be ignored as a determinant of financial leverage for two reasons. First,

attention has to be paid to the fact that either a change from the furniture-manufacturing sector to the food-manufacturing sector or a change from this to the clothing-manufacturing one is not really a big variation. This is even more so in the case of very small firms. The reason for this is that, as widely accepted, these three trades are very traditional, labor-intensive ones, where small firms are abundant and their larger counterparts are rare. Consequently, there cannot be much variation in the effects on financial leverage captured by the variable industry and so not much in financial leverage either. Second, the industry variable is important in absolute economical terms. The industry coefficient estimate given by main regression equation number (2) implies that changing from one manufacturing sector to the next causes an over 0.07 change in financial leverage to happen. Taking into consideration that the sample mean for financial leverage is 0.33, this over 0.07 change represents an almost 23% variation.

C.5. PROFITABILITY

Fulfilling expectations for a very small firms sample, higher profitability is associated with lower financial leverage. As can be seen from Table II, the simple correlation coefficients between profitability and financial leverage are practically nil and the smallest among all the calculated ones for the variable financial leverage. Despite this, profitability turns to be the fifth and seventh most important determinant of financial leverage in the main regression equations in Table III. Consequently, when controlling for all the other variables entering the main regression equations in Table III, Pearson partial correlation coefficients totally different from those in Table II are obtained. They are -0.31 at the level of significance of 0.04 for the time-series-average cross-sectional data set and –0,22 at the level of significance of 0,01 for the pooled time-series cross-sectional data set. This is one more piece of finding that lends support to validation arguments of methodological choices adopted in this work.

Another aspect of the behavior of the variable profitability reinforces the above conclusions. This concerns the interaction that exists between the variable profitability and that of inflation in the regression equations. The individual impacts of these two variables upon financial leverage diminish when they are alternately introduced into the main regression equations being all the others already in. Although Table III does not show, the diminishing effect is higher when profitability is introduced into the regression equations, thus reducing the impact of inflation. This means that it is profitability that reduces the impact of inflation upon financial leverage and not inflation that reduces the impact of profitability on financial leverage. Since, as already seen in the Subsection on industry, inflation is inversely associated with general economic conditions in this sample, this finding is in accordance with that by Ferri and Jones (1979 p.640) and the findings in previous studies referred to by them. This is that in expansions even marginal firms have access to debt capital, but, in recessions the established firms that have both a record of past success and relatively good performance obtain a large percentage of the new debt. In the present sample, financial leverage diminishes when inflation goes up, but this effect is smaller for small firms that are more profitable. Splitting the sample between the least and the most profitable very small firms confirms this. The regression coefficient for inflation is as expected significant and more negative for the subsample composed of the least profitable very small firms.

Even though the above results are in line with strong theoretical arguments and the findings of the majority of earlier studies, they are not seen as a challenge to what pure economic reasoning and high level corporate finance theory dictate. Rather, they might be used together with results from other works to make the point that pure economic reasoning and finance theory could perhaps be rethought to accommodate the certainly special reality of very small firms. Caution should be taken when using the findings with profitability from this work on their own, though, in view of the fragile way the variable is measured, as already declared in the methodology part of this report.

C.6. ENTREPRENEUR'S RISK TOLERANCE

The variable entrepreneur's risk tolerance is, out of all the ones that enter the main equations, the least important in regression equation number (2). It is the sixth most important determinant of financial leverage in regression equation number (1). This is in keeping with its position as a correlate of financial leverage, as shown in Table II. Accordingly, it is the sixth most important correlate of financial leverage for the time-series-average cross-sectional data set and the eighth for the pooled time-series cross-sectional one. The performance of this variable indicates that the reality of small firms is such that much more is imposed by circumstances than is left free for decision making and risk taking by the entrepreneur. This contrasts

with the high importance ascribed to these two dimensions of business activities in specialized literature. This view is further reinforced when analysis goes from financial leverage to own working capital, which is, as already said, a financial risk measure perhaps much more important for small firms than financial leverage. The variable entrepreneur's risk tolerance becomes statistically non-significant in one of the corresponding equations, to be shown in the next part of the study.

C.7. GROWTH

Growth is associated in a direct manner with financial leverage in this very small firms sample. According to the main regression equations, that is, regression equations (1) and (2), in Table III, it is respectively the seventh and the sixth most important determinant of financial leverage. Its ranks in the intercorrelation matrix table, Table II, are fifth for the time-series-average cross-sectional data set and fourth for the pooled time-series cross-sectional data set. Results with this variable fulfill expectations in all respects.

As seen in the review of literature, Toy and others (1974) allege that the theory of finance suggests a positive association between growth and financial leverage. It is then very fortunate that results in this study are in accordance with this prediction and expectations for very small firms. However, despite what finance theory suggests, theoretical arguments and empirical evidence from previous works vary in support of all three possibilities, namely, direct association, inverse association and no relationship. Consequently, the findings from this research can be seen as at least a contribution that adds support to one side of the debate.

C.8. BUSINESS RISK

Like many others in the study, the variable measuring business risk, namely, variability of sales, follows an amazing pattern of consistency in all regression equations that are run. As shown in Table III, its coefficient is always negative and significant. This means that firms that are riskier in terms of variability of sales tend to have lower debt ratios. Thus, the evidence from this sample is in line with that part of the theoretical literature that hypothesizes a negative association between business risk and financial leverage. The importance of this finding is threefold. First, as seen in the first part of this study, it is in that part of the theoretical literature that the predictions of the traditional theory of finance are brought forward as a rationale. Second, that part of the theoretical literature seems to outweigh, in terms of number of defenders and number of arguments, those favoring either a direct or no relationship. Third, in spite of all that, empirical findings corroborating an inverse relationship are numerically inferior to those giving strength to the opposing theories. Thus, the high importance of one more piece of finding supportive of such predictions. This finding is in accordance also with the expectations set for a very small firms sample. Such an aspect is most important too, since it lends support to the proposition of many authors that the predictions of the traditional theory of finance would be the truer the smaller the firms being investigated.

The behavior of the variable variability of sales in the regression analyses following a consistent pattern and in accordance with the mainstream of the related literature helps to validate the choices of methodology and variable measurement made in this work. Other findings that validate the measure of business risk have been discussed in the sections on variable definition, correlation matrix, size results and industry results. Taken together all these findings point to the conclusion that the variable variability of sales captures most of the effect of business risk on financial leverage and so does its job very well.

No matter the strength of the above considerations, it should be acknowledged that the results of this work apparently lend some support also to two propositions that diverge, although not frontally, from the mainstream of literature. The apparent support for them comes from the fact already reported that the logarithmic scale of risk works better in the regression equations than the original one. This difference in variable behavior means that the strength of the effect of risk in reducing the use of debt is the lower the higher the firm finds itself in the risk scale. The propositions have already been reviewed in the part of this work on review of literature. The first proposition concerns the theoretical model that predicts a U-shaped relationship between business risk and optimal debt level. Tests to see whether the proposition is confirmed in its totality do not succeed, though. These tests consist of running alternative regression model specifications, containing two terms defined in business risk, one raised to the unit exponent and the second to a higher one. The first coefficient is always negative and the second always positive, as implied by a U-

shaped relationship, but the second never attains statistical significance. The best model fitted is the one where business risk in the second term is raised to the fourth exponent. The second proposition concerns the suggestion by Jensen and Meckling (1976) that firms with large debt burdens may take excessive risks because the shareholders gain if the risks succeed but the creditors lose if they fail. A test to see whether this proposition finds some empirical correspondence in the field of the very small firms does not succeed either. Over 20 cases in this sample have values for the variables financial leverage and business risk that are among the highest 10%, but there does not exist even a pair of them that belongs to the same case. Therefore, the above belief perhaps makes sense only in the big business world.

Auxiliary regression equations (5) and (6) are primarily displayed for the analysis of the variable age. However, they are useful here too since they allow to efficiently complement the analysis of the behavior of the business risk variable without the need to add one more column to Table III. The impact of the asset composition variable on the coefficient of the business risk variable following the introduction of the former variable into the regression equation is striking. This is easily visible from an inspection of what happens when the analysis goes from regression equation number (6) to number (5). Such a finding is notwithstanding puzzling, since there seems to be no foundation for it in both the theoretical and the empirical literatures. It appears that an impact of this magnitude may be only possible because of a high degree of correlation between the two independent variables. From Table II, it can be seen that this is not the case. Besides and still more puzzling, the correlation coefficients tend to be positive. Asset composition is a measure of technological risk and business risk of market risk. If anything, they should be inversely correlated, according to previous discussions. Mechanization, automation and capital-intensity are only feasible if, and to the extent that, standardization is possible. Standardization is inversely dependent upon business risk. Fortunately, the paradox here detected is only apparent, since findings with the variable own working capital to be described in the next part of this work will help to understand further this interaction between the impacts of business risk and asset composition upon financial leverage. While complete elucidation of the apparent paradox will have to wait, a related conclusion can be here advanced. This is that the finding, no matter how paradoxical, runs in favor of validation of the methodology and variable choices made for this work, since it seems only intuitive to expect interactions to happen between variables measuring the same or related phenomena. Business risk and asset composition are measures of two types of risk, yet very related.

Finally, it appears noteworthy to report that additional statistical analyses show that the observed association between business risk and financial leverage in this research sample extends beyond the debt-equity dichotomy to include the term maturities of the liabilities. There is a strong tendency for the most stable very small firms to take resort to the most risky type of funding, that is, short-term debt. Very small firms that are in between the scale of stability tend to make use of the halfway risky kind of funding, namely, medium- and long-term debt. Last, there is a strong tendency for the unstable very small firms to run away from debt to take resort to the risk-free type of funding, that is, equity. In sum, there seems to be an almost perfect inverse matching of business and financial risks.

C.9. INFLATION AND GENERAL ECONOMIC CONDITIONS

As expected, inflation is not strongly associated with financial leverage, as can be seen from Table III. Running against the mainstream of literature, the observed association is negatively signed. This has already been pre-justified in the literature review part of this work. The absence of inflation from the regression equations does not make any difference in statistical and econometric terms. Keeping it, however, adds one more piece of evidence on the effects of high inflation in Brazil and helps to explain why size is associated with financial leverage, as already seen in the respective subsection of the work. It also helps to strengthen arguments validating the use of the measure of profitability in this work, as already seen in the subsection on profitability results.

The measure of economic conditions, that is, annual variation in the manufacturing gross domestic product, is statistically significant only when the measure of inflation is not in the regression equations. Besides, its coefficient is negatively signed. This would mean that bad economic conditions would be associated with higher financial leverage rates. This intuitively contrary-to-expected result is easily understood when the correlation between the measure of inflation and that of economic conditions is taken into account together with their interaction in the regression equations. The conclusion is that the negative association between economic conditions and financial leverage is spurious and belongs in fact to inflation.

There are two reasons for this. First, the correlation coefficient between inflation and economic conditions is positive and high. Although not shown in Table II, it is equal to 0.64 at the level of significance of 0.00. Second, the reduction in significance is much higher with relation to the measure of economic conditions when both the measure of inflation and that of economic conditions are introduced into the regressions equations with all the other variables already in. Most probably, the strong direct association between the measures of inflation and economic conditions is due to the effects of the Brazilian governmental economic packages to eradicate inflation in the early nineties. They were so radical that slowed down economic activity to a minimum, at least, in the short and medium run.

C.10. AGE

There seems to be no point in keeping age in the main regression equations, that is, regression equations (1) and (2). Auxiliary regression equations (5) and (6) are added to Table III in the hope that in conjunction with regression equation number (2) they help to present the reasons for that. The only difference in terms of variables entering the analysis between regression equation number (2) and number (5) is the absence of age from the first equation and the presence of it in the second one. It can be seen from regression equation number (5) that the regression coefficient for age by far does not reach statistical significance and that even so it has the "wrong" sign. The introduction of age into the analysis results in some changes concerning the parameters and statistics related to the other variables, but they are not expressive. It is worth noting, however, that asset composition is one of the variables affected and that the result of this influence is a worsening of the significance of its regression coefficient. Taking asset composition out of the analysis, shown in regression equation number (6), makes the regression coefficient of age statistically significant, but does not reverse its sign. The meaning for this is better understood when the analysis goes from regression equation number (6) to number (5), that is, when asset composition is introduced into the regression equation it substantially robs explanation power from the age variable. Besides, the fact that there is no reversal of sign simply means that it should not really change, since the negative sign does not belong to the age variable but instead to the asset composition variable. Thus, the small, negative, statistically non-significant in the case of the time-series-average cross-sectional data set, correlation coefficients between age and financial leverage shown in Table II are spurious. They are the result of the association represented by the relatively sizeable, negative and highly statistically significant correlation coefficients between asset composition and financial leverage being repassed over. The association represented by the relatively sizeable, positive and highly statistically significant correlation coefficients between asset composition and age is the force that causes such repassing.

The Pearson partial correlation coefficient between age and financial leverage, controlling for asset composition, is 0.06 at the level of significance of 0.35 for the time-series-average cross-sectional data set. It is -0.02 at the level of significance of 0.42 for the pooled time-series cross-sectional data set. Such findings accord with the reasoning put forward in the previous paragraph, that is, that the association represented by the simple negative correlation coefficients between age and financial leverage belongs in fact to the asset composition variable. Controlling for asset composition makes the small correlation found between age and financial leverage disappear. The conclusion from this is that age has no effect on financial leverage in this sample of very small firms.

The foregoing casts serious doubt on the belief that age determines financial leverage. However, this statement may be subjected to qualifying on two grounds. First, this work has studied very small firms and the idea that their reality is quite different from those of medium and large enterprises is widely accepted. This difference may perhaps account for the finding of no relationship. Wedig and others (1988 p.37) found age and asset composition to be associated in the same regression equation with debt ratios at very high significance levels, respectively in an inverse and direct manner. This is quite different from the regression results of this study. However, they worked with hospitals, which are much different in nature and size from the sample firms here studied. Second, it may be said that the fact that asset composition and age are highly interrelated in this sample precludes the study of the effects of age on financial leverage in separate. Accepting this might imply that a definite conclusion will have to wait for similar future studies that will happen to select randomly a sample where age is not interrelated with asset composition. However, this is not a necessary condition. From inspection of Table II it can be seen that the variable industry appears to be more entangled with the variable asset composition than the variable age. Even so, no difficulties have been faced in the respective subsection in studying its effects on financial leverage in separate. Besides, it is highly probable that interrelation between age and asset composition will always

exist in very small firms samples regardless of the sampling method employed. Stages of development models for small business growth, like the one by Peterson and Shulman (1987), invariably make a connection between aging and becoming more capital-intensive.

Some possible explanations for the contrary-to-expected negative finding with the variable enterprise age have been forwarded in the part on review of literature. Two are addressed here. The first is the one by Petersen and Rajan (1994 p.10) that young firms are externally financed while old firms finance via retained earnings. As Rajan and Zingales (1995 p.1457) state that profitability for small firms may proxy for the amount of internally generated funds and retained earnings are generally the bulk of internally generated funds, profitability is taken here in substitution for retained earnings in order to check Petersen and Rajan's proposition. Analysis of the relationship between profitability and age produces no supportive evidence in this work for the proposition. To start with, enterprise age and profitability are not correlated with each other, as can been seen from Table II. In addition, there is no change at all in the regression coefficient of the variable profitability when the variable enterprise age is introduced into the regression equation. This can be seen when inspection goes from regression equation number (2) to (5) in table III. The second explanation is the one that depreciation financing substitutes for public equity in the life cycle model of corporate capital structure and result in lower debt ratios for older very small firms. This finds only elusive supportive evidence in this work. Asset composition is negatively associated with financial leverage as already reported. Since higher levels of fixed assets most probably mean higher levels of depreciation, the observed negative association between asset composition and financial leverage might be seen as in fact between depreciation and financial leverage. As there is a relatively high correlation between asset composition and enterprise age, as can be seen from Table II, the point could be made that enterprise age determines negatively financial leverage because older enterprises have higher levels of depreciation. However, all this is false, as the introduction in the next part of the work of own working capital into the analysis will make it possible to see.

Explanations for a postulated positive association between enterprise age and financial leverage are also defeated by the evidence provided by this sample. As seen in the respective section on rationale in the part of review of literature, Barton and others (1989 p.41) suggest that mature firms have higher debt ratios because they experience lower earnings volatility. According to Table II, enterprise age is negatively correlated with the measure of business risk in this study. This accords with part of that explanation but older very small firms are not associated with higher debt ratios in the sample. Petersen and Rajan (1994 p.12,27,30) presented extensive evidence that firm age is negatively associated with borrowing costs and positively with credit availability to small firms. Perhaps these associations are easily perceived in the running of enterprises, leading consequently scholars to mistakenly conclude that enterprise age is associated with financial leverage.

IV. DETERMINANTS OF OWN WORKING CAPITAL

Although researchers on the determinants of capital structure never extend their analyses to encompass either net or own working capital or even any other different measure of financial risk, this section is here included for three main reasons. First, because regressing own working capital on the same variables as those on which financial leverage is regressed shows that an interesting phenomenon of most importance for the size of enterprises studied takes place. Second, because it is felt that complete explanation of the phenomenon of financial leverage at the level of very small firms calls for considerations on destination of funds. Such approach would be necessary in face of the fact, as already remarked, that the reality of small firms is composed of short-term phenomena much more than that of big businesses, at least in relative terms. The concept of own working capital, besides being a financial risk measure, even more stringent than financial leverage, comes some way towards encompassing also destination of funds and so may lend itself for addressing such a preoccupation. This preoccupation seems to find some correspondence at the level of big enterprises with that of those authors who argue that financial leverage should be defined in terms of only long run financing. Most certainly, these authors understand that the short-term perspective lags in terms of importance well behind the long-term one when these large enterprises are at issue. Specifically, adding considerations on own working capital helps to explain further the role and behavior of five independent variables, namely, asset composition, operational cycle, business risk, enterprise age and

entrepreneur's risk tolerance. Third, because gaining insight into the functioning of small firms to produce guidelines for their efficient managing is one of the major objectives of the study. Then, appropriate considering of what is most important according to their reality should by no means be neglected. Probably, analyses of either net or own working capital have not been included until now in studies on financial leverage because authors have been either focusing only large enterprises or studying financial leverage not as a financial risk measure.

Table IV
Determinants of Own Working Capital

Own Working Capital (OWC): [(Equity – Long-term assets)/Current assets]; Model-transformed dependent variable: LN[1/(1-OWC)]; Asset Composition: (Long-term assets/Total assets); Operational Cycle: average inventory age + average receivables collection period; Size: Log_{10} of employment level; Industry: 0 if furniture, 1 if food, and 2 if clothing; Profitability: perceptual scale; Entrepreneur's Risk Tolerance: perceptual scale; Growth: growth in employment level; Business Risk: Log_{10} of Sales Variability; Inflation: 0 if years 1987-88 or 1990-92, 1 if 1989; Age: Log_{10} of number of years since establishment.

Regressors/Independent Variables	Main Cross-Sectional Regression Equations		Auxiliary Pooled Times-Series Cross-Sectional Regression Equation
	Time-Series-Average	Pooled Times-Series	
	(1)	(2)	(3)
Constant	2.045 (4.55)***	2.676 (6.34)***	1.976 (3.60)***
Asset Composition	-0.658[3] (-1.98)*	-0.786[4] (-2.73)**	-0.930[3] (-3.16)**
Operational Cycle	-0.004[1] (-2.86)**	-0.004[3] (-3.40)***	-0.004[4] (-3.63)***
Size	-0.610[2] (-2.81)**	-0.953[1] (-4.74)***	-0.914[2] (-4.58)***
Industry	0.193[5] (2.03)*	0.279[2] (3.25)***	0.340[1] (3.76)***
Profitability	0.097[4] (2.34)*	0.113[5] (2.98)**	0.114[6] (3.06)**
Entrepreneur's Risk Tolerance	-0.059[8] (-1.13)	-0.088[8] (-1.87)*	-0.081[9] (-1.72)*
Growth	-0.006[6] (-1.73)*	-0.009[6] (-2.73)**	-0.007[8] (-1.96)*
Business Risk	0.303[7] (1.95)*	0.388[7] (2.34)*	0.520[5] (2.94)**
Inflation		0.202[9] (1.67)*	0.199[10] (1.67)*
Age			0.536[7] (1.96)*
Linear Equation R^2	0.52	0.41	0.43
Regression F	4.30**	8.81***	8.50***
Number of observations	41	126	126

Obs: 1) First values in the main body of the table are coefficient estimates; 2) numbers in parentheses are t-statistics; 3) numbers in brackets give the relative importance of the variables in a decreasing order; 4) *, **, and *** denote statistical significance in one-tailed tests, at the 5%, 1%, and 0,1% levels, respectively.

Own working capital is conceptualized as the part of equity in excess of long-term assets, which encompass the amount of fixed assets and other long-term investments of the firm. In operational terms it is defined as a proportion to isolate for the sheer effects of size, as follows:

$$OWN\ \ WORKING\ \ CAPITAL = \frac{\left(Equity\ -\ Long\text{-}term\ Assets\right)}{\text{Current } Assets}. \tag{8}$$

The approach for measuring own working capital is similar to that for measuring financial leverage. A time-series-average measure is used in a main cross-sectional regression equation and a single-period, year-end measure is used in a main and in one auxiliary pooled time-series cross-sectional regression equations. The mathematical model used in the case of own working capital is:

$$Y = 1 - e^{-(a+\sum b_i X_i)}. \tag{9}$$

The marginal effects of an independent variable upon the dependent variable are given by the formula:

$$\frac{\partial Y}{\partial X} = e^{-(a+\sum b_i X_i)} b_i, \tag{10}$$

which is derived from equation (9). As the mathematical relations herein are similar to those already analyzed for the financial leverage variable, solutions for calculating relative and absolute economical significance are either the same or very similar. Consequently, there seems to be no need for further addressing the issues here. Besides, no use of absolute economical importance will be made in the coming presentation.

By comparing regression equations (1) and (2) in Table IV with regression equations (1) and (2) in Table III, it can be noticed that an interesting phenomenon of most importance for the size of enterprises studied takes place. Such a phenomenon is that all signs, including the one for the constant, but one, reverse. The reversal of all signs is expected because own working capital is also a measure of financial risk, only reversibly scaled. The only coefficient sign that does not reverse is that of the independent variable asset composition. It is very unfortunate that there is no extensive literature, either theoretical or empirical, on own working capital research, let alone specialized on small business, that could be reviewed. If there were, it would probably help to explain better the apparent contradictory statistical finding that a measure of operational risk influences in the same direction two different measures of financial risk reversibly scaled. Notwithstanding, interpretation will be attempted in the following paragraphs.

The above failure to reverse sign can be seen as a combination of raising equity participation with redirecting previously existing equity capital from financing working capital to fund long-term investments when the very small firms decide to modernize themselves technologically. Three possible explanations could be forwarded to explain such a behavior. First, it could be due to lack of access to sufficient long-term financing, either institutional or not, either equity or debt. Second, it could be that very small firms decide to modernize themselves technologically after profitable years, whose high profits are meantime invested in over-liquidity. Third and last, the collateral value of increased long-term investment assets would make it possible to borrow relatively more at short term. Perhaps, only future research purposely designed may fully clarify as to which of these explanations is the true answer to the problem.

Some arguments and findings already referred to may help to address the above issue to the extent that it is possible to do it in this work. First, running against the third possibility above, there is the argument that for the small firms a higher proportion of fixed assets does not mean higher capacity to collateralize debt. This is an argument with which the findings of this research agree, as already seen in the previous part of this work. If this is true for total debt, there seems to be no reason to believe that it is not for short-term debt, which is normally unsecured, anyway. Second, running against the second possibility, there is the fact that the variable entrepreneur's risk tolerance becomes statistically non-significant in the own working capital regression equation number (1) and marginally statistically significant in the number (2). This same fact runs in favor of the first possibility. It is not difficult to accept that financial market conditions may work so strongly against very small firms that financing behavior concerning working capital becomes independent from either risk taking or decision making by the entrepreneur. The fact that a higher R Squared and a higher F statistic are obtained for the time-series-average cross-sectional regression on financial leverage as compared with those on own working capital tends also to signal this. Third and last, still more support for the first possibility comes from the fact that the variable operational cycle becomes the first most important explanatory variable in the time-series-average cross-sectional own working capital regression equation. As already seen, there are no straightforward reasons for enterprises with longer operational cycles to make more relative use of debt, let alone for the variable to take on such important associations as those shown in all regression equations. Thus, it should not be coincidence but the

impact of very strong forces that drives small firms with relative more short-term investment equity funding to systematically convert to a greater extent this equity funding into short-term debt financing. It is assumed here that working capital is financed almost as easily by debt as by equity and that fixed capital is very difficult to be financed by debt in the small firms sector. It is also assumed that longer operational cycles mean higher levels of working capital.

Fazzari and Petersen (1993 p. 338) reported having been challenged as to the correctness of the interpretation given by them to their finding of a negative coefficient for the measure of net working capital in a fixed investment regression equation. For them, this finding meant that firms paying zero dividends were using net working capital to smooth increases in fixed investment because of the fact that they were externally finance constrained. The counter-argument was that high fixed floatation costs of external finance, especially new shares issues, cause firms to seek external funds infrequently, store the proceeds in working capital and then draw down working capital to finance fixed investment. The above authors tested for both interpretations by means of splitting the sample on the median usage of new equity finance. As the coefficients remained negative and significant in both sample haves, but more negative for firms that used less equity finance, the authors took these results as inconsistent with the bunching explanation and consistent with their financing-constraint interpretation. In the present work, splitting the sample between the least and the most profitable very small firms shows that the regression coefficient for asset composition is significant and more negative for the sub-sample composed of the most profitable very small firms. This means that small firms that are more profitable might store profits in working capital and then draw down working capital to finance fixed investment. However, this does not mean that the association found between own working capital and asset composition is totally mechanical and not the result of external finance constraints as argued. To start with, the variable profitability is in the regression equation and the coefficient of the variable asset composition is despiteful highly significant. Moreover, the introduction of the variable profitability into the own working capital regression equation with all the others already in causes only a trivial downward change in the absolute value of the coefficient of the variable asset composition, below 5%. This is inconsistent with the bunching explanation and provides additional support for the financing-constraint interpretation advocated also in this work.

Another very interesting change that takes place when the analysis goes from the financial leverage main regression equations to the own working capital main regression equations is that the variable asset composition loses much of its importance. Importance migrates from a measure that captures the effect of operational risk to other measures that capture other types of influence on the dependent financial risk measures. Besides, the other measure of operational risk, that is, business risk, does not shown any expressive upgrading from its previous low relative importance as a determinant of the independent financial risk measure. The overall picture that is depicted then is that, paradoxically, determination of the financial risk measure departs from operating risk measures to other operating influence measures as the financial risk measure goes from a not-so-stringent to a more stringent one. Fortunately, this apparent contradiction is solved by realizing that asset composition is no longer a measure of operating risk in the own working capital equations, but of level of needed funding. In the financial leverage main regression equations, asset composition captures the effects of outside constraints on external financing provision in face of the level of operating risk associated with the production technology adopted by the small firm. Sensitivity to this small firms' kind of operating risk is higher among the lenders, mainly of long-term funding, than among the borrowers. Financial leverage encompasses both short- and long-term debt for the financing of both short- and long-term assets of the firm. Availability of long-term debt financing for funding long-term investment is well known to be very low for the small business sector. In the own working capital main regression equations, asset composition signalizes the amount of long-term investment that is left without financing by outside lenders and that needs to be financed with short-term financing. Availability of short-term debt financing for funding working capital is much less of a problem relatively to availability of long-term debt financing for funding fixed investment in the small business sector. Risk sensitivity is lower among the providers of short-term debt financing than among the providers of long-term debt financing. The amount of short-term debt financing outsiders are willing to provide is determined by them having as a reference the total working capital needed as indicated by volume of operation much more than having as a reference the risk involved. Either risk sensitivity is extremely low among the small business owners or smallness is a question of choosing from one of only two pairs of combinations between risk and return. Consequently, the amount of short-term debt financing that is provided and taken would be externally and internally determined as a function of the level of operations and other aspects that influence the level of total working capital needed. As size and operational cycle are

better indicators of this, they accordingly show themselves to be more important than asset composition as determinants of the dependent variable in the own working capital main regression equations. Summing up, the reasons for the variable asset composition to lose importance are the same as for it to fail to reverse sign, that is, very small firms are externally finance constrained mainly when fixed investment funding is needed.

This finding that the asset composition variable changes roles from the financial leverage regression equations to the own working capital regression equations makes it possible to gain some more insight into its own behavior and that of the business risk variable. As seen in the previous part of this work, the asset composition variable robs expressive explaining power from the business risk variable when it is introduced into the financial leverage regression equation, with all the other variables already in. The business risk variable also robs expressive explaining power from the asset composition variable under the same exercise. As the asset composition and business risk variables are not correlated with each other, tend to be positively, when, if anything, should be negatively correlated, the conclusion in that part of the work has been that the overlapping impacts of these two variables upon financial leverage are puzzling and apparently paradoxical. The discussion in the previous paragraph makes it possible to clarify further this point since it indicates that this overlapping of impacts lies on the behavior of lenders and not on that of borrowers. If borrowers are willing to reduce the level of own working capital in order to make fixed investment possible, it cannot be their sensitivity to risk that drives the negative impact of asset composition on financial leverage. As to the overlapping of impacts, it is because when lenders are deciding on the amount of debt financing that they are willing to provide they necessarily take into account the combined effects of both the technological and the market risks. If there is no variability of sales involved, there is nothing to be magnified by the operating leverage effect, no matter how high the fixed assets ratio. Therefore, there is neither technological nor market risk. Conversely, if there are no fixed costs involved, there is no magnification, no matter how high the variability of sales. Again, therefore, there is neither technological nor market risk. Concluding, on rigorous terms, neither risk exists without the existence of the other. The damage that either one kind of risk can cause depends upon how high it is contingently upon how high the other one is.

This same finding helps to clarify another issue related to the nature of the impact of the variable asset composition on financial leverage in this very small firms sample. It tells that, although higher levels of fixed assets most probably mean higher levels of non-debt tax shields, it is not these higher levels of non-debt tax shields that are behind the negative impact of asset composition on financial leverage. Three arguments suffice to prove the point. First, the effect of non-debt tax shields works internally via managers' decisions and from the discussions above it becomes clear that they are not the people that are reducing financial leverage in response to higher values of asset composition. Second, the effect of non-debt tax shields works also via lowering the need to protect gains from taxation, but by reducing own working capital the very small firms are most probably paying more interest rather than less. Long-term debt funding is risky because of its longer maturity but short-term debt funding used by very small firms should be even riskier because it is unsecured and more easily available. Third, the effect of non-debt tax shields is the higher the higher the importance of income tax but it has been argued throughout this work that income tax is not an important variable amongst very small firms. Their tendency to evade taxes makes income tax only marginally important and consequently non-debt tax shields too.

Last, the analysis of own working capital makes it possible to see that the supportive evidence for one of the possible explanations for the negative association between enterprise age and financial leverage is only elusive. The explanation as seen in the previous part of this work is that enterprise age determines negatively financial leverage because older enterprises are depreciation financed. The supportive evidence from this work is that asset composition, measured by the level of fixed assets, is negatively associated with financial leverage and has a relatively high positive correlation with enterprise age. The idea behind the explanation is that financial resources obtained via depreciation are used to retire debt, mainly short-term, leaving equity unchanged. Although higher levels of fixed assets most probably mean higher levels of depreciation, the fact that the asset composition variable changes roles from the financial leverage to the own working capital regression equations runs against the debt retirement interpretation. In fact, it means that, as discussed to exhaustion in the previous paragraphs, short-term financing becomes extremely important as the level of fixed assets goes up and the availability of long-term debt financing shrinks following suit.

V. SOME IMPLICATIONS FOR SMALL FIRMS, POLICY MAKING AND SMALL BUSINESS SUPPORT

Implications of the results obtained through this study for policy making for small business development, small business support initiatives and small enterprises' decision making are numerous. Only a few of them are addressed here, though. The use of industry norms as a guide for the corporate financial manager to decide on his firm's financing mix is a proposition by Van Horne and other finance textbook authors. Their usefulness as such a guide is an issue that Scott and Martin (1975 p.67) hoped to address by means of their precursory empirical study. Findings in this study with the variable industry lend support to this textbook common orientation that firms should have in mind the averages for their industries when deciding on levels of financial leverage, net working capital and the like. They also indicate that it is a sound idea that financial policymaking and support initiatives for small firms should be designed taking into account industry differences. However, caution should be exercised in doing so since differences in leverage ratios are due to a great number of factors, some of which the analyses in this study show to be much more important than industry itself. The problem is that the "crude" average for each industry has to be corrected for the effects of the other independent variables before it can be used in the way the common orientation above advises. Taking this research as an example, results from bivariate analysis indicate that such an orientation has no application for financial leverage decision making, since the "crude" averages are not statistically different from each other. The orientation has much more application for own working capital decision making, since the relative importance of the industry variable is much higher in this case. The difficulty facing policy-makers, practitioners and small businessmen is how to get data on the other factors and which mathematical formula to use for the necessary correction.

Findings with the variable asset composition have implications that are even more important for the recipients of the research recommendations. Small firms must be very careful when evaluating market opportunities that imply making use of new, modern technology, which the enterprise still has to acquire and learn about its operation. Results with the financial leverage regression equations signalize that technological modernization not only will not help raise debt financing through higher collateralization capacity but also will exert a downward influence on its supply via augmenting operating risk. Results with the own working capital regression equations complementarily suggest that pressure on equity capital is so high that it induces a redirecting of previous existing equity capital from funding working capital to funding long-term investment assets. Further analysis combining both types of regression equations leads to the conclusion that this financing behavior is by far more due to small firms being finance rationed by lenders than to free decision making on the part of the small entrepreneurs. As the variable own working capital takes on negative values, there occurs to be even financing of long-term assets with short-term debt, which is a behavior that frontally disobeys one of the oldest principles in finance, namely, the preservation of time-balance between assets and liabilities. Thus, some small firms in this study seem to be taking risk at levels that seem to be approaching gambling. Furthermore, there does not seem to be even reason for gambling in view of the fact that asset composition is not correlated with profitability in this sample.

If small business development is to be boosted, policy making and support action have to be designed upon knowledge that helps to explain the reasons for the very uncomfortable small firms state of affairs depicted above. Answers have to be found, for example, as to why plant and equipment are often considered unacceptable as viable security in the case of small firms. This is a piece of truth that has frustrated a hope that has made part of explicit public small business support policies as old as the ones that made part of the Brazilian Second National Development Plan (1975-79). This governmental plan envisaged that technological modernization would increase, via ownership of fixed assets, the availability of institutional credit to small firms. Rapid technological obsolescence, lack of lawful instruments that efficiently make sure that just claims on collaterals are respected, and malfunctioning of the judiciary are but some possible reasons for the small firms difficulties in having access to long-term debt financing.

Barbosa (1991 p.108-11) carried out an evaluative research work designed upon some strong criticisms of the Brazilian official support effort to small business development that might help with the task of warning on the dangers of technological modernization of small enterprises. One criticism was that technological modernization was imposed by the official support effort in such a way that the assisted small enterprises ended up suffering from the shortcomings of bigness, without getting rid of those of smallness. An example of this would be incurring the risk embodied in modern technology, that is high operational

leverage, simultaneously with that arising from markets that are unstable, unpredictable and averse to product standardization, that is high sales volatility. The research being reported in this article reveals that both risks account for the fact that small firms are totally externally finance constrained. The above-referred official support effort has been discontinued and replaced by a private institution before the present research fieldwork took place. However, it is possible that the private institution has been operating under the same guidelines since it has inherited most of the human and capital assets that had belonged to its predecessor.

The fact that the research work reveals that age has no impact on financial leverage is of extreme importance for policy making and organizations that aim at giving support to small business development. Unfortunately, however, the implications of the results are not good for them as an assessment of past activities. This is so because age, out of all the variables that entered the study, is understood to be the one that best summarizes the forces through which the action of small business support is exerted. As seen on review of literature, the reasoning underlying the postulated connection between age and financial leverage is composed of two arguments. The first is that as small firms age they begin to establish a financial profit/loss record and credit history and their owners become increasingly proficient at communicating their vision of the opportunity they are pursuing. The second is that, because of this, more and more finance options become available at presumably increasingly accessible direct and indirect cost terms. As it may be inferred from the results of this research, either one or both of two possible outcomes are taking place. The first is that there may be no point in trying to improve managerial capabilities as long as the objective is debt financing. The other one is that small firms may be failing to reduce information asymmetries both with and without small business support. If it is with small business support, this has either been ineffective or covered only an unexpressive number of small firms.

One apparently strong counter-argument could be put forward in relation to the above unfavorable evaluation. This is that size shows to have an impact on financial leverage and that the same reasoning as above underlies the postulated association between these two variables. Consequently, small business support would be effective according to the results obtained with the size variable, although not with those obtained with the age variable. Many explanations could be offered for this apparent contradiction. First, as seen in the part on review of literature, the above reasoning is only one, and perhaps the weakest, out of various on the relationship between size and financial leverage. Second, the effect of size on financial leverage is actually to an expressive extent a result of the fact that the variable does capture the influence of business risk on financial leverage, as demonstrated in a previous section. Third, the correlation coefficients between the measure of size worked with in the shown regression equations and that of age are negative and not statistically significant in one case, as exhibited on Table II. Moreover, the measure of size with a relatively high, positive and statistically significant correlation with age, namely total assets, is not statistically significant in the regression analyses, as already reported in the section on data and variables.

VII. CONCLUSIONS

Results with the measure of business risk in this work are of great importance. The finding that very small firms that are in such a way riskier make relatively less use of debt supports the defenders of the predictions of the traditional optimal capital structure theory. More important still, this finding reinforces the argument that their opponents have been working with biased samples that have not included small firms. Extending the analysis to include the behavior of own working capital makes it possible to confirm that the impact of business risk on financial leverage is due to decisions by both borrowers and lenders. Some specific testing provides additional direct evidence against opposing hypotheses about the business risk-financial leverage relationship. The U-shaped hypothesis and the one that firms with large debt burdens may take excessive risks because the shareholders gain if the risks succeed but the creditors lose if they fail are two of them. At least as far as the very small firms' world is concerned, they seem to deserve no credence. Despite the satisfactory results with the measure of business risk, this variable is not one of the most important as a determinant of financial leverage in this study. This is in disagreement with its weight in the theoretical literature.

Size is associated in a direct manner with financial leverage in this very small firms sample. It ranks very high in importance relative to the other variables included in this study. It is amongst the three

most important ones. This is in keeping with the great amount of literature that is spared to it. The results with the variable size from this very small firms sample are consistent with the argument that many prior authors have not found a relationship with financial leverage because their samples have been composed of extremely large enterprises. They are also consistent with the argument that prior findings that size and financial leverage are negatively related are conciliated with the prior ones that they are positively associated by means of the life cycle model of capital structure. Samples composed of firms ranging from small to medium size would result in findings of a positive relationship because the participation of personal and private equities would give way to increasing participation of debt as firms grow from small to medium. Samples composed of firms ranging from medium to large size would result in findings of a negative association because participation of debt would give way to increasing participation of equity, now public, as firms grow from medium to large. Analysis of interactions of the impacts upon financial leverage of, on the one hand, size with those of, on the other hand, the other variables in the study makes it possible to gain insight into the reasons why size determines financial leverage. This has much to do with risk given the way size interacts with the measure of business risk in the regression equations. The way size interacts with the variable inflation is viewed as reinforcing this conclusion.

Results with the variable asset composition contrast with the mainstream of literature the most. To start with, it is by far the most important determinant of financial leverage in this very small firms sample. In addition, the association is indirect, that is, very small firms with a higher proportion of fixed assets have lower financial leverage. Since that literature deals mostly with extremely large enterprises and this research with very small firms, a conciliatory view is forwarded. This is that big enterprises have a higher proportion of their fixed assets represented by properties while very small firms by plant and equipment. Properties are much more viable as collateral than plant and equipment and so may raise availability of loans, as well as lower their costs. The existence of a strong interaction with business risk in the regression equations reinforces the arguments that asset composition proxies for operational risk. Extending analysis to include the behavior of own working capital makes it possible to verify that the impact of asset composition on financial leverage is largely due to decisions by lenders.

Very small firms that are more profitable are less leveraged. This is in accordance with the weight of both the theoretical and empirical literatures. It is also in accordance with expectations established for a very small firms sample. As to the allegation that such a finding runs against pure economic reasoning and high level theory, the negative association would be explained by the possibility that very small firms are normally above "optimal capital structure". This would happen by virtue of the fact that these enterprises are totally externally finance constrained with relation to long-term funding. Recourse to the more readily available, non-secured types of short-term financing would be the solution for the long-term fund shortage. However, because they are at the same time riskier and more expensive than long-term financing, these types of short-term financing would put the very small firms' "optimal capital structures" to very low levels of debt ratios. Very small firms may exhibit lower debt ratios, but even so, they may be generally higher above "optimal capital structure" than big businesses are. Thus, any abnormal profitability would be used to bring capital structure back to nearer the optimal level.

Not many issues are raised by results with the measure of growth. Growth is associated in a direct manner with financial leverage in this study as expected for a very small firms sample. The theoretical and empirical literatures seem to be evenly distributed among arguments and prior results supporting positive, negative and no relationship between growth and financial leverage. Amongst the arguments, there is the allegation that the traditional theory of finance suggests a positive association. So, the findings of this research in relation to growth can be seen as at least a contribution that adds support to one side of the debate, fortunately the side where the traditional theory of finance stands.

Unlike growth, industry generates many insightful findings. First, in accordance with the mainstream of the theoretical and empirical literatures, industry class is associated with financial leverage in this very small firms sample. Second, in keeping with expectations established for a very small firms sample, this finding reinforces the allegation that authors that have not found such an association have so failed because they have been working with samples biased towards large firms. Third, the association follows a pattern that is coherent with the extent to which standardization and, consequently, mechanization is possible in each of the three manufacturing sectors studied. Fourth, interaction with other variables makes it possible to uncover that business risk is one of the forces acting through industry class. The high importance of such an insight is twofold. The first reason is that failure to provide evidence that business

risk is a variable acting through industry class has been a weakness of the supporters of a postulated relationship between industry class and financial leverage. The second reason is that, according to both sides of the debate, the existence of a relationship between financial leverage and industry class is evidence in favor of the theory of optimal capital structure, on condition that industry class proxies for business risk.

Support for a postulated relationship between age and financial leverage is not found in this work. This is so despite the existence of negative correlation at a non-negligible degree between age and the measure of business risk, which would be, according to the theoretical literature, a main force acting through age. Age is also correlated with asset composition in this sample. Since the coefficient of correlation is very high in this case, the point is made that this fact precludes the study of the effects of age on financial leverage in separate.

Three variables are included in this study either tentatively or to avoid specification errors. In such cases, there is not much point in talking about findings that support one theory or another. Operational cycle is one of such variables. Results with it have been striking. To start with, this variable is among the three most important determinants of financial leverage in this study. In addition, in keeping with the theoretical and empirical literatures, as well as with expectations set for a very small firms sample, longer operational cycle is associated with higher financial leverage. Moreover, its exclusion from the analyses would mean that half of the insights into the other determinants would not be unearthed. Notwithstanding, little explanation is possible to offer for so strong an association between operational cycle and financial leverage. The first thought is that the forces behind this variable are the same as those that are behind size. However, as the individual impacts of both variables upon financial leverage do not trouble one another in the regression analyses, that is not the case in this very small firms sample.

Inflation is the second of these variables. It is negatively associated with financial leverage. Although the association is not strong, such a result runs against the mainstream of both the theoretical and empirical literatures. On the other hand, it is felt that the special cases of Brazil and of the very small firms account for this finding. An almost all-indexed economy and an all-indexed tax code, extremely high inflation rates and underdeveloped capital markets are the different features of Brazil in relation to the backgrounds of most of the existing corporate theoretical and empirical literatures. As to the very small firms, their financial decisions are not as much influenced by both income tax and features of the tax code as those of the big enterprises with which most part of these literatures deals. Besides, unlike the big ones, the very small enterprises are extremely externally finance constrained.

Last, there is the variable entrepreneur's risk tolerance, which is in the sample positively associated with financial leverage, as logically expected. However, it is amongst the least important determinants of financial leverage in this work. This is taken as meaning that the reality of the very small firms is such that much more is imposed by circumstances than it is left free for decision making and risk taking by the entrepreneur.

Extending the analysis to encompass the determinants of own working capital makes it possible to see the role-changing behavior of the variable asset composition. From a measure capturing the effects of operational risk in the analysis of financial leverage, it becomes a measure of level of needed external investment capital funding in the analysis of own working capital. This behavior helps to better understand the forces acting behind the relationships between financial leverage and its determinants. A general insight is that the main source of influence is the long-run finance providers, who strongly "discriminate" against very small firms, as put by an extensive small firm literature. A specific one is that non-debt tax shields are not the force that causes the negative impact of asset composition upon financial leverage.

Although few alternate measures for some of the determinants of financial leverage are available for the present research, the empirical results are not robust to most of them. This problem is addressed in two ways. First, it is felt that there are good specific explanations for the reduced robustness, as discussed in the methodological part of the work. Suffice now report the general feeling. It is a common argument in an extensive literature on small business that employment level is a better measure of size for small firms and total asset for big enterprises. In this work, the impression is that the idea that measures are appropriate only if a specific size band is under consideration should be extended to other variables. Second, to compensate for this lack of robustness, comments alongside the text point out results that lend themselves to validate the measures and the methodology adopted in this work. For example, the interactive impacts of, on

the one hand, business risk and, on the other hand, size and industry upon financial leverage in accordance with what high level theory would predict are an indication that the measure of business risk is measuring what it should. A second example would be profitability, which is measured in an apparently precarious manner. Besides behaving in the analysis in accordance with the weight of the theoretical and empirical literatures, its impact upon financial leverage interacts with that of inflation in a way that previous empirical findings and logical reasoning signalize.

Some implications of the study for the very small enterprises, policy making for small business development and small business support initiatives are addressed. For the very small firms, the main recommendation is that caution should be taken when contemplating growth that implies technological modernization. This most important move raises significantly the level of operational risk of the firm, does not seem to upgrade the firm's capability to collateralize debt and worsens the liquidity position of the firm. As to policymaking, the main recommendation is that action should only take place based upon knowledge, not available in Brazil yet, of the reasons for the apparently insurmountable difficulties very small firms face when they search for long-term funding. As to small business support initiatives, the main recommendation is that they should go through a process of self-evaluation. Either they are not managing to help very small firms to reduce information asymmetries by means of improving managerial capabilities or this is not important as long as gaining access to long-term debt financing is concerned.

This work suggests three lines of enquiry for future research. First, investigation on small firms' finance should pursue more eagerly the use of more rigorous methodologies for collecting, rearranging and analyzing data. Failure to include sets of determinants that are more complete and failure to use multivariate statistical analysis seem to be the main shortcomings of previous research in the area. Second, search and inclusion of new, tentative variables seems a promising avenue to explain differences in capital structure and related concepts within small firms. This orientation should include variables with little use in corporate capital structure studies. This study itself works with the concept of operational cycle, showing that it is a very important variable, but leaving for future research to explain fully the forces acting through it. Third, given the importance of administrative and technological modernization for small firms, research should put much more emphasis in searching explanations for why obtaining long-term financing for that end is so insurmountable a task for these enterprises. Investigation should go as deep as the institutional framework.

Last of all, this work generates so many insights that one more observation should be made in separate. This is that the widespread belief that the very small firms' balance sheets cannot be seriously taken for whatever they will be used should perhaps be rethought. Technical people believe they are forged in such a way and extent that if compared to each other no pattern other than that of randomness would result. If this were really the case, not so many results would obtain in this research. Perhaps, even more insightful results would have obtained if the reporting authors had changed their own point of view as early as the time of research design. Experience from this work tends to indicate that failure on the part of previous studies to produce more satisfactory results can be ascribed to both missing variables and failure to convert accounting data into a form that makes sense from the point of view of finance. Very small firms' profit and loss statements have still to go through such an evaluation, since they are not directly used in this research as a result of a preliminary decision based upon this same above referred widespread pessimistic belief.

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