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# Non-financial stakeholder relationship costs as a determinant of capital structure: Empirical evidence from first-time business Start-Ups

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# Non-Financial Stakeholder Relationship Costs as a Determinant of Capital Structure: Empirical Evidence from First-Time Business Start-Ups*

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**Abstract.** Titman (1984) is the first to argue that non-financial stakeholders (customers, suppliers and employees) pass on their expected liquidation costs to the firm. In his framework, firms can influence the probability of liquidation by choosing an appropriate capital structure. Other studies have reasoned that the bargaining power of non-financial stakeholders (NFS) may also impact on financing decisions. This paper investigates these ideas in a sample of first-time business start-ups, where ex-ante failure risk is high and NFS have to make relationship-specific investments. We find that the size of NFS liquidation costs significantly reduces leverage and the proportion of bank loans. These effects are strengthened when suppliers have strong bargaining power. Finally, start-ups reduce their reliance on bank loans when customers and suppliers are in a powerful bargaining position.

Keywords: *capital structure, start-ups, non-financial stakeholders, liquidation costs, bargaining power*

JEL: *C31, G21, G32, G33*

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## 1. Introduction

This paper examines empirically how the relationships between a firm and its various non-financial stakeholders (NFS) influence capital structure. While the finance literature so far has paid a great deal of attention to how relationships with and among financial stakeholders impact on financing decisions,[1] a few theoretical studies have argued that a firm's customers, suppliers and employees may have an effect, too. Titman (1984) is the first to show that leverage controls the future liquidation decision, which in turn affects the terms of trade between a firm and its NFS. The reason is that non-financial stakeholders price the probability of rupture of their explicit and implicit contracts with the firm. So, NFS pass on their expected liquidation costs resulting from the loss of relationship-specific investments to the firm, and firms can influence the probability of liquidation by limiting their debt ratio. This idea has been refined in subsequent models by Cornell and Shapiro (1987), Maksimovic and Titman (1991) and Arping and Lóránth (2006), among others.

Besides the liquidation cost channel, the bargaining power of NFS vis-à-vis the firm may also have an impact on capital structure decisions. Bronars and Deere (1991), Dasgupta and Sengupta (1993) and Perotti and Spier (1993) predict a positive relation between NFS bargaining power and firm leverage. These authors argue that once contracts with NFS have been established, firms can lower the amount of surplus that NFS can extract by increasing their debt ratio. Higher leverage also enlarges the threat of not undertaking investments that are necessary for firm survival. In contrast, Sarig (1998) shows that when the firm worries about suppliers threatening to curtail the supply of specialized factors of production, NFS bargaining power will negatively affect leverage,

[1] Jensen (1986), for example, argues that free cash flow problems between a firm's management and shareholders can be restrained by increasing firm leverage. Also, agency problems between debt- and shareholders can be reduced by shortening debt maturity and increasing the proportion of monitored debt (e.g., Myers, 1977; Diamond, 1984). These theories have been tested in numerous empirical studies, using data from different countries. Overall, the literature finds that the collateral value of assets, profitability, growth opportunities, risk and firm size affect the debt ratio (e.g., Rajan and Zingales, 1995; Wald, 1999; Brounen *et al.*, 2006), debt mix (e.g., Houston and James, 1996; Krishnaswami *et al.*, 1999) and debt maturity (e.g., Barclay and Smith, 1995; Guedes and Opler, 1996; Johnson, 2003).

both prior to and after contract negotiations with non-financial stakeholders. The reason is that a lower debt ratio reduces the probability that a suspension of input supplies will lead to the firm's liquidation.

The empirical literature investigating the impact of NFS liquidation costs and bargaining power on capital structure is scarce, largely because of the difficulty to operationalize these theoretical constructs by means of accounting data. Titman and Wessels (1988), Opler and Titman (1994) and Welch (2004), for example, use selling expenses/sales and R&D/sales to proxy for the size of NFS liquidation costs whereas Sarig (1998) operationalizes employee bargaining power by means of labor expenses to operating income. A few studies have related these concepts to the structure of input/output markets. For instance, Bronars and Deere (1991) use industry-level unionization rates to capture employee bargaining power whereas Kale and Shahrur (2006) proxy NFS bargaining power by concentration in customer and supplier industries, respectively. Not surprisingly, this prior empirical research has yielded mixed results regarding the impact of NFS relationship costs on capital structure. As an example, Titman and Wessels (1988) and Opler and Titman (1994) document a significantly negative relation between NFS liquidation costs and leverage whereas Welch (2004) finds no effect. Likewise, Sarig (1998) reports a negative relation between employee bargaining power and leverage whereas Bronars and Deere (1991) find that industry-level unionization rates positively affect firm debt ratios within industries. Nonetheless, survey evidence by Brounen *et al.* (2006) reveals that more than 30% of CFOs in France and the UK consider customers/suppliers worrying about bankruptcy as an important determinant of their debt choice. This determinant ranks third, after financial flexibility and the volatility of earnings and cash flows, and precedes taxes, agency costs and information asymmetries.

This study uses unique survey data on a sample of first-time business start-ups to examine the role of NFS relationship costs as a determinant of capital structure. First-time business start-ups are neither the result of an incorporation of a previously self-employed activity, nor the result of a change in incorporation type. Also, these firms do not arise from the split-up of another firm, nor

are they new divisions of existing firms. These firms therefore need to build up relationships with NFS from scratch. In establishing these relationships, business start-ups face some specific disadvantages compared with industry incumbents. The main reason lies in their combination of a high ex-ante failure risk and large information asymmetries. It is well known that one out of two business start-ups stops its activities within the first five years (e.g., Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2004). Large information asymmetries between firm-insiders and outsiders basically result from the lack of an operating history. Furthermore, entrepreneurs in first-time business start-ups have not built up a reputation yet and, because they usually have a majority stake in their firm, have a lot of discretionary power regarding the firm's strategy and operations. As a result, once their firm is heading for financial distress, entrepreneurs in highly levered firms are likely to engage in risk shifting, which may even accelerate the firm's default. Establishing relationships with business start-ups is thus a high-risk venture for NFS, especially when they have to make large relationship-specific investments. Yet, from the start-up's point of view, relationships with customers, suppliers and employees are crucial to ensure the firm's profitability and survival. By limiting the likelihood of liquidation upfront, the start-up firm may induce non-financial stakeholders to make the necessary investments. Also, when liquidation risk is limited, the terms of trade between the firm and its NFS are likely to be more favorable to the start-up. Titman (1984) argues that choosing a capital structure with limited debt is useful for this purpose.

In addition to these characteristics (i.e., no history and reputation, a high failure risk), start-ups are rather small, such that potential NFS may be in a better bargaining position vis-à-vis the firm. As non-financial stakeholders are not locked in yet at the moment of start-up, entrepreneurs cannot ignore NFS bargaining power. Indeed, NFS may try to extract rents from the start-up when negotiating the features of their contracting relationship. Yet, entrepreneurs who have to decide on their venture's initial capital structure are likely to worry about liquidation. The reason is that entrepreneurs typically invest substantial financial and human capital in their company whereas their private benefits of control are sizeable (e.g., Hamilton, 2000). Hence, consistent with Sarig

(1998), we expect that entrepreneurs will limit their debt ratio to reduce the negative impact of NFS bargaining power on survival. Also, they may adjust the debt composition and maturity structure to reduce the probability of liquidation. This conjecture contrasts with the arguments that have been made for mature, listed firms. Yet, for these firms, contracts with NFS are already in place and liquidation may not be a too large concern. Besides, we conjecture that NFS bargaining power may also influence the pricing of NFS liquidation costs to the start-up firm and thus capital structure. As an extension to the papers of Titman (1984) and others, we will thus examine whether the relation between NFS liquidation costs and capital structure is stronger when NFS have enough bargaining power to actually influence the profitability of the firm's products and/or services. If NFS bargaining power is important, we expect that business start-ups will have to bear a larger fraction of NFS liquidation costs, which can be offset by adjusting capital structure.

Overall, this paper extends the limited empirical evidence on the role of non-financial stakeholders in four ways. First, this study is the first to examine the impact of NFS relationship costs on capital structure in a context (true business start-ups) where NFS have to decide on making relationship-specific investments and where firms are highly dependent on establishing and nurturing these relationships. As first-time business start-ups lack history, studying the impact of NFS within this sample also has the advantage that the research setting is relatively clean. The initial capital structure reflects the firm's true choice at start-up and is not yet influenced by the firm's operating performance. Indeed, mature firms that were successful in setting up valuable relationships with NFS are likely to accumulate higher profits and – to the extent that these are retained within the firm – a lower debt ratio. Second, we improve upon prior contributions that largely use accounting data to construct proxy variables for the theoretical constructs of interest.[2] More particularly, this study combines accounting data with unique and detailed survey data, which

[2] In their paper, Titman and Wessels (1988) warn the reader that the negative relation between their uniqueness measure, which is based on selling expenses/sales, R&D/sales and job quit rates, and leverage may be caused by the relation between this variable and non-debt tax shields and the collateral value of assets.

allows us to differentiate between the capital structure effects of customers, suppliers and employees. The value of information that is not included in the financial statements was already documented by Kale and Shahrur (2006). These authors find strong support for the capital structure effects of NFS relationship costs, proxied by customer/supplier concentration ratios and the presence of joint ventures and strategic alliances. Third, whereas Kale and Shahrur (2006) also examine the impact of NFS liquidation costs and bargaining power on capital structure, this paper is the first to test whether the influence of NFS liquidation costs is larger in situations where NFS are in a strong bargaining position. Finally, in addition to leverage, we also examine other capital structure variables, such as the debt composition and maturity structure. Our study thus recognizes explicitly that entrepreneurs may use more than one specific aspect of financial structure to deal with NFS relationship costs. In the case of newly established ventures in traditional industries, public debt markets are not accessible due to these firms' small scale. Hence, the external financing sources at the moment of start-up typically consist of bank loans and trade credit (e.g., Berger and Udell, 1998; Huyghebaert and Van de Gucht, 2006). When trade credit is rolled over continuously during the course of trading transactions with suppliers, it becomes a permanent source of financing for companies. Franks and Sussman (2005) find that compared with suppliers, banks enforce liquidation rights more strictly upon default. Furthermore, short-term bank loans have more stringent debt-servicing obligations so that firms default more easily, ceteris paribus.

Our results show that the size of NFS liquidation costs significantly affects capital structure, both statistically and economically. In particular, an increase in NFS liquidation costs decreases the debt ratio and the proportion of bank loans in total debt. In addition, supplier bargaining power has an impact on the relation between NFS liquidation costs and capital structure, as we find that the interaction term between NFS liquidation costs and supplier bargaining power is significantly and consistently negative in the leverage equation. This result suggests that suppliers can more easily pass on their expected liquidation costs to the firm when they have larger bargaining power. In

contrast, the interaction terms between NFS liquidation costs and the bargaining power of customers and employees, respectively, are not significant in any of the capital structure equations. These results could indicate that the latter NFS are able to fully charge their expected liquidation costs when they enter into a contracting relationship with the start-up firm, independent of their bargaining power. Furthermore, our results show that when customer and supplier bargaining power are large, start-ups reduce their reliance on bank loans, ceteris paribus. Customer bargaining power also has some marginal negative impact on the debt ratio. Overall, these findings are largely consistent with the model of Sarig (1998) and suggest that entrepreneurs, being concerned about their firm's liquidation, reduce their vulnerability to NFS bargaining power by lowering their debt ratio and the proportion of bank loans in total debt when making initial financing decisions. Finally, the results show no impact of employees on initial capital structure. Also, we find no significant effects of NFS relationship costs on the maturity structure of bank debt.

The remainder of this paper is structured as follows. The next section briefly discusses the existing literature on the role of NFS liquidation costs and bargaining power, from which we develop our hypotheses. In Section 3, we introduce our unique sample of first-time business start-ups, followed by a discussion of the variable measurements and methodology in Section 4. In Section 5, we present and interpret our empirical findings. Finally, Section 6 concludes the paper.

## 2. Development of Hypotheses

Leverage, debt mix and debt maturity have been at the center of attention for both researchers and practitioners for decades. After Modigliani and Miller (1958) developed their irrelevance propositions, arguing that in perfect financial markets it does not matter how you slice up the cake as long as its size remains constant, a plethora of different capital structure determinants have emerged, building on various financial market imperfections. Whereas originally this search focused on taxes, financial stakeholder information and agency costs, later studies borrowed

insights from the industrial organization literature to develop new capital structure determinants.[3] Although most of these studies have examined the use of strategic debt to influence the interactions between firms and their output market competitors, a small but growing number of papers focus on the relationship costs between a firm and its customers, suppliers and employees. These non-financial stakeholders typically have incomplete information about the firm but, unlike shareholders and creditors, have no direct financial stake. Yet, NFS can influence firm value through the terms of trade under which they enter into contracting relationships. This study examines two categories of NFS relationship costs, namely NFS liquidation costs and the costs resulting from NFS bargaining power. We conjecture that by choosing an appropriate capital structure, firms can reduce the negative impact of NFS relationship costs on their value. Our hypotheses are summarized in Table 1.

<<Insert Table 1>>

## 2.1. NFS LIQUIDATION COSTS

Although negotiated contracts with NFS are usually short-term, NFS also have implicit long-term claims on the firm when re-contracting with this same firm is less costly than switching to another firm. As these implicit claims cannot be unbundled and sold apart from the NFS' other business dealings with the firm, the risk associated with holding these claims is difficult to diversify. In the event of the firm's liquidation, NFS may incur large losses as these implicit claims expire worthlessly. NFS liquidation costs (and costs of financial distress[4]) typically rise with the amount

[3] In their review article, Harris and Raviv (1991) even consider the research field that relates capital structure with input and output markets to be the most promising.

[4] We recognize that liquidation may not be a necessary condition for NFS to incur some costs. Maksimovic and Titman (1991), for example, show that firms with a reputation of being a high-quality producer may reduce the quality of products/services to cut costs when approaching financial distress. As with liquidation costs, rational NFS will also include these expected costs of financial distress in their terms of trade.

of relationship-specific investments made by non-financial stakeholders. Such investments include the acquisition of product-related skills by customers, investments in customer relations or supply chains by suppliers, and the investment in job-specific knowledge by employees.

Like financial stakeholders, NFS value their direct and indirect claims with the firm, taking into account the company's risk profile. Hence, the value of NFS contracts is sensitive to information about the firm's financial condition, even when an actual default on debt is still remote. This process influences the terms of trade between the firm and its NFS. Borenstein and Rose (1995), for example, find that airlines reduce ticket prices in the period before a bankruptcy filing. In other words, they find that NFS pass on their expected liquidation costs – e.g., resulting from the loss of frequent flyer advantages – to the firm through the price customers are willing to pay. From the firm's point of view, minimizing the proportion of NFS liquidation costs that are passed on maximizes firm value, ceteris paribus. Theoretically, this can be achieved by lowering the probability of liquidation, lowering NFS liquidation costs and/or lowering the extent to which these costs are passed on to the firm. So far, the literature has mainly focused on using capital structure as a device to lower the probability of liquidation, possibly because management can decide more easily upon this mechanism.[5] In our empirical research design, we also follow this approach and test whether firms adapt their financial structure to the size of NFS liquidation costs so as to minimize the likelihood of liquidation (Hypothesis 1 hereafter). Also, we examine whether NFS bargaining power influences the relation between NFS liquidation costs and capital structure, as NFS bargaining power may influence the extent to which NFS liquidation costs are passed on to the firm (see Hypothesis 3 in Section 2.3).

This paper focuses on three important capital structure variables: leverage, debt mix (the proportion of bank loans in total debt) and bank debt maturity (long-term bank debt to total bank debt). Prior empirical work on NFS liquidation costs (Titman and Wessels, 1988; Titman and

[5] An exception is Arping and Lóránth (2006), who look at how the firm's diversification policy can be used to lower NFS liquidation costs.

Opler, 1994; Welch, 2004; Kale and Shahrur, 2006) has concentrated on the leverage decision. This is an obvious choice as the debt ratio determines when a firm's control rights are passed on from shareholders to creditors and as the latter are fiercer liquidators than the firm's owners. Thus, an increase in firm leverage increases the probability of liquidation, ceteris paribus. But the liquidation decision of companies that default on their debt is also influenced by the composition and the maturity structure of that debt (e.g., Gilson *et al.*, 1990; Franks and Sussman, 2005). In the case of business start-ups, debt largely consists of bank loans and trade credit. As argued above, public bonds are not a viable financing source, given their small size.

The literature provides several arguments why a larger proportion of bank loans compared with trade credit increases the probability of liquidation, ceteris paribus. First, banks include restrictive covenants in their debt contracts to reduce adverse selection and moral hazard problems after the loan is made (e.g., Kim *et al.*, 2005). However, this practice is also likely to increase the probability that funds are cut off once firms default on their bank debt. In fact, Carey *et al.* (1998) find evidence consistent with the idea that banks wish to establish a reputation of being a fierce liquidator. As start-up firms usually borrow funds from only one bank, it is difficult for these firms to switch to another lender when bank loans are not renewed (e.g., Rajan, 1992; Kim *et al.*, 2003). The reason is that other banks will tend to interpret such a cut-off as a negative quality signal. Second, Berger and Udell (1998) report that over 90% of bank loans to small business borrowers are collateralized. Hart (1995) and Manove *et al.* (2001) show that such practices induce banks to liquidate a distressed company prematurely following default, thereby avoiding the effort and the risk involved in restructuring a distressed firm. Third, Wilner (2000) and Huyghebaert *et al.* (2006) argue that if borrowers generate a large percentage of lender profits, creditors will be more lenient in periods of financial distress. Compared with suppliers, banks earn relatively small profit margins and their loan portfolios are spread over a larger number of customers. As a result, banks hold only a limited implicit equity stake in borrowers and therefore liquidate sooner than non-bank lenders,

such as suppliers. Consistent with this idea, Franks and Sussman (2005) find that banks enforce liquidation rights more strictly following default by SMEs than suppliers.

Finally, the maturity structure of the debt influences the timing of the liquidation decision as debt holders can refuse to roll over their loans at each maturity date (Berger and Udell, 1998). So, lengthening debt maturity reduces the probability of early liquidation, ceteris paribus. In support of this conjecture, Brounen *et al.* (2006) find that minimizing the risk of having to re-finance in bad times is ranked as the second-most important determinant of debt maturity structure. Similar results are obtained by Bancel and Mittoo (2004) and Graham and Harvey (2001). As a result, firms that face NFS with large firm-specific investments are likely to prefer long-term debt when the possibility of re-financing current loans is not guaranteed. This paper examines the maturity structure of bank debt, as banks are fiercer liquidators compared with suppliers (supra). Also, trade credit generally is very short-term financing by nature and entrepreneurs only have to decide upon debt maturity structure when negotiating a loan with their bank. Examining the maturity structure of bank debt will also allow us to disentangle the debt maturity from the debt composition decision.

The above discussion results in the following hypothesis for the relation between the size of NFS liquidation costs and capital structure:

> ***Hypothesis 1****: Firms with large NFS liquidation costs will limit their probability of liquidation, ceteris paribus. Therefore, the larger NFS liquidation costs are, the lower the leverage and the proportion of banks loans in total debt will be and the longer the bank debt maturity, ceteris paribus.*

## 2.2. NFS BARGAINING POWER

In this section, we investigate the impact of NFS bargaining power on the capital structure variables discussed above. NFS bargaining power is hereby defined as the ability of non-financial stakeholders to appropriate a fraction of the firm's surplus. Factors that increase the bargaining power of NFS are, for example, customer size, the concentration of purchases with a few suppliers and union representation. The theoretical literature has shown that capital structure can be used strategically to reduce the amount of surplus (rents) that NFS can extract from the firm, but

researchers generally differ in their assumption as to who is more averse to liquidation: non-financial stakeholders or the firm itself. As a result, they also differ in their predictions about the effect of NFS bargaining power on capital structure. Furthermore, a distinction should be made between situations where firms try to influence contract terms ex ante through financing decisions and their ex-post temptation to re-balance their relative bargaining power vis-à-vis NFS through capital structure changes.

Bronars and Deere (1991), Dasgupta and Sengupta (1993) and Perotti and Spier (1993) all assume that in comparison with NFS, the firm (its shareholders) is not largely concerned about liquidation. Furthermore, they concentrate on situations where contracting relationships with NFS have been well established. Bronars and Deere (1991) start from the observation that by issuing debt instead of equity, firms are obliged to pay out a portion of future earnings to creditors. Hence, these obligations limit the surplus that a (powerful) labor union can extract without driving the firm into liquidation. Similarly, Dasgupta and Sengupta (1993) claim that the relative bargaining power of NFS vis-à-vis the firm determines which (fixed) portion of the surplus – after interest payments – is paid out to NFS. By increasing the debt ratio ex post, the size of this portion is reduced. Their model predicts that, ceteris paribus, firms will increase leverage when dealing with strong NFS. Perotti and Spier (1993) find a similar effect on leverage, albeit for a different reason. They show that ex post, a highly leveraged firm can force more concessions from its NFS by threatening not to undertake investments that are crucial for survival.

In contrast to the previous contributions, Sarig (1998) considers the impact of bargaining power upon financing decisions before contracting relationships are well established (ex ante). Also, Sarig assumes that the firm (its shareholders) is more averse to liquidation than are its NFS. Hence, in the case of first-time business start-ups that have to decide on their initial capital structure, we expect to find support for Sarig's (1998) model as firms still need to establish contracts with NFS and as entrepreneurs are likely to highly value their venture's survival. First, ownership in business start-ups is typically highly concentrated in the hands of the entrepreneurs.

In our sample, 64.62% of entrepreneurs own more than 50% of their firms' shares. Most of the other equity is provided by family and friends whereas only four firms received venture capital. As entrepreneurs invest both (part of) their savings and human capital in their firm, their personal wealth is unlikely to be well diversified. Second, and consistent with Hamilton (2000), we find that entrepreneurs in first-time business start-ups highly value private benefits of control. 56.28% of the entrepreneurs in our sample indicate that their main motivation for becoming an entrepreneur is the challenge of managing their own firm. Also, 45.58% of entrepreneurs indicate that being their own boss is an important reason for setting up their own firm. Purely financial reasons – i.e. earning more than under wage employment – are important for only 19.53% of entrepreneurs. In sum, when NFS bargaining power is extensive, we expect entrepreneurs to reduce their vulnerability to threats by NFS by adjusting their capital structure so as to curb the likelihood of liquidation. Sarig (1998) shows that by restricting their debt ratio, firms can limit their vulnerability to threats by suppliers of specialized factors of production to curtail input supplies. This constraint on leverage reduces the probability of liquidation when input supplies are suspended, thereby curbing the bargaining power of NFS. Furthermore, a lower debt ratio also increases the firm's own portion of the surplus. From our discussion on the relation between debt composition and maturity and the probability of liquidation (supra), we derive that firms can also moderate their vulnerability to supplier threats by limiting the proportion of bank loans in total debt and by lengthening bank debt maturities.

The above discussion results in the following hypothesis:

> ***Hypothesis 2****: The stronger NFS bargaining power is, the lower the leverage and the proportion of bank loans in total debt will be and the longer the bank debt maturity, ceteris paribus.*

## 2.3. INTERACTION BETWEEN LIQUIDATION COSTS AND BARGAINING POWER

As an extension to the first hypothesis and the theoretical models of Titman (1984) and others, we argue that the effect of NFS liquidation costs on capital structure will be strengthened when NFS

have strong bargaining power. Unlike agency costs between shareholders and creditors, which generally affect firm value euro per euro through the price of debt and thus should be fully incorporated into capital structure decisions (e.g., Jensen and Meckling, 1976), we conjecture that the liquidation costs of NFS will be taken into account especially when these costs can be easily passed on to the firm through product and input prices. As the extent to which NFS liquidation costs can be charged to the firm depends – next to institutional characteristics – on the relative bargaining power of NFS vis-à-vis the firm, we hypothesize that firms adjust their capital structure to deal with NFS liquidation costs to a larger extent when NFS are in a stronger bargaining position. So, besides the simple term *NFS liquidation costs*, as mentioned in Hypothesis 1, we also expect the interaction term with NFS bargaining power to impact on capital structure.

This results in the following hypothesis:

> ***Hypothesis 3****: The impact of NFS liquidation costs on capital structure (Hypothesis 1) is strengthened when NFS have strong bargaining power. So, NFS liquidation costs * NFS bargaining power is negatively related to leverage and the proportion of bank loans in total debt and positively to bank debt maturity, ceteris paribus.*

To conclude this hypotheses section, Equation (1) summarizes our research design:

$$CS_{ij} = a_{i1} + a_{i2} * LC_j + a_{i3} * BP_j + a_{i4} * (LC_j * BP_j) + \sum_{l=1}^{L} b_{li} X_{lj} \quad (1)$$

with: $CS_{ij}$ = capital structure variable *i* (i=1: leverage; i=2: mix; i=3: maturity) of firm *j*
$LC_j$ = proxy variable for NFS liquidation costs in firm *j*
$BP_j$ = proxy variable for NFS bargaining power in firm *j*
$X_{lj}$ = set of *L* control variables for capital structure variable *i* of firm *j*

## 3. Data

The empirical capital structure literature tends to focus on listed firms, largely because data on these firms can be easily accessed. However, to test the impact of NFS relationship costs on financing decisions, a sample of newly established entrepreneurial ventures may yield additional insights. Also, Cornell and Shapiro (1987) argue that firms that have not yet developed a reputation should pay most attention to the costs that NFS suffer upon the firm's liquidation when making capital

structure decisions. The reason is that, because of a lack of reputation, they cannot assure non-financial stakeholders that the firm's optimal future strategy involves honoring NFS' implicit claims. Hence, capital structure can be used as an alternative bonding mechanism for these firms. Another interesting characteristic of business start-ups is that they face high failure risk and large information asymmetries, which makes it more difficult to convince NFS to make relationship-specific investments. Indeed, the latter are sunk costs that cannot be recuperated if the firm is liquidated. Finally, compared with mature industry incumbents, business start-ups have relatively low bargaining power vis-à-vis NFS as start-ups on average are small. As NFS are not locked in yet at the moment of start-up, entrepreneurs cannot ignore NFS bargaining power. Therefore, we conjecture that first-time business start-ups take the bargaining power of NFS into account when determining their initial capital structure. Whereas financial data on privately held firms are not readily available in other countries, limited liability firms in Belgium ("corporations") – except for financial institutions, insurance companies, foreign exchange brokers and hospitals – are legally required to file their annual financial statements with the National Bank as of start-up. This information is commercialized by Bureau Van Dijk Electronic Publishing by means of the Belfirst database.

Our sample selection process involved different stages. First, we used the PASO START database to select our sample of business start-ups. This database contains survey information on a sample of 638 Belgian corporations established between October 2001 and September 2002 and employing between one and 49 persons.[6] These firms represent a 23.81% response rate in the population of start-ups that met the above criteria. The survey itself consists of 91 questions, which meticulously polled entrepreneurs on their firm's financial and ownership structure, their operations and organization and their strategic choices at start-up. While some questions are entirely quantitative in nature (e.g., the percentage of sales that are customer-specific, the percentage of unionized workers), other questions had to be answered on a five-point Likert-scale. Entrepreneurs

[6] www.paso.be

were questioned shortly after start-up, such that there is no survival bias in this database. Our study combines this unique survey information with the firm's annual accounts in the Belfirst database.

In the second stage of the sample selection process, we excluded all firms that were not entrepreneurial and first-time business start-ups. This selection criterion removed the firms that were incorporations of a previously self-employed one-person business or firms that changed their corporation type. Also, newly established subsidiaries of existing firms, split-ups, spin-offs, and other start-ups that are affiliated with existing firms were deleted from the sample. These screening criteria reduced the sample from 638 to 223 true business start-ups, which have not yet built up any form of reputation in the input and output markets. After deleting the firms with insufficient data to perform the multivariate analyses, our final sample includes information on 209 first-time business start-ups.[7] Figure 1 presents the industry distribution of these firms. All firms are narrowly focused and report only one NACE code. Likewise the population, a significant part of firms in our sample is active in trade and services. This contrasts with most previous studies on newly established enterprises, which focus either on manufacturing start-ups (e.g., Huyghebaert and Van de Gucht, 2006) or on high-tech ventures (e.g., Manigart and Struyf, 1997). A notable exception is Cassar (2004), who looks at a sample of 292 Australian firms that are randomly drawn from the population of business start-ups during 1996–1998.

<<Insert Figure 1>>

Table 2 reports some descriptive statistics on firm size, asset structure and financial structure at the end of the start-up year. The median firm employs three people in the start-up year and its total assets amount to €179,500. 69.14% of entrepreneurs invest only the minimum equity that is required by law in order to establish a corporation (not reported). Since median total assets is less than median financing sources, more than half of sample firms incur accounting losses during the

[7] For 14 firms, capital structure data were missing as these firms' financial statements had not been entered into the Bureau Van Dijk database. These firms are likely to have been liquidated before filing their first financial statements. Yet, in terms of NFS relationship costs, these firms are comparable to the ones that are included in the database.

start-up year. Summary statistics on asset structure reveal that tangible fixed assets represent 35.32% of total assets on average, whereas inventories and cash holdings represent 18.41% and 14.48%, respectively. The start-ups in our sample are highly leveraged, as outside (i.e., non-entrepreneurial) debt[8] on average equals 60.84% of total financing sources in the start-up year. The median debt ratio even amounts to 68.30%. We use total financing sources rather than total assets as the scaling variable because it abstracts from the earnings generated and retained during the first accounting year. In our sample, on average 36.12% of debt is extended by banks and 23.90% by suppliers. 72.25% of firms use bank debt whereas 97.26% use trade credit in the start-up year. Other creditors mainly include the workforce and tax authorities. Only 30.93% of debt outstanding matures after one year on average, which reflects the importance of current liabilities (including trade debt) for business start-ups. For bank debt, this percentage amounts to 82.17%.

<<Insert Table 2>>

We extended the operating and financial information on the business start-ups discussed above with the annual accounts of all incumbent firms in the corresponding 179 five-digit NACE industries over the period 1996–2001, i.e. during the six years that precede the sampling year. This additional database includes information on 35,528 firms. As will be explained in the next section, data on recently established start-up firms will be used to calculate historical, exogenous industry-level variables to measure some of the control variables.

[8] Debt is defined as the sum of long-term debt and current liabilities. Yet, loans extended by the entrepreneurs to their own firm are regarded as a source of (preferred) equity rather than debt financing, and thus these loans are not included in the debt ratio. The reason is that entrepreneurs are unlikely to voluntarily file for bankruptcy when the debt-service payments on these loans can no longer be met since. Indeed, unlike the USA, Belgium has a creditor-oriented bankruptcy law. So, debtors have no incentive to seek protection under it. Furthermore, most bankruptcy procedures in Belgium involve the firm's liquidation. Over the period 1998–2004, only 3.84% of bankruptcy procedures involved a reorganization of the distressed firm (Dewaelheyns, 2006). On average, 16.20% of entrepreneurs lend money to their firm and these loans represent 17.09% of total debt in start-up accounts.

## 4. Variable Measurements and Methodology

To provide conclusive evidence on the influence of NFS relationship costs on a firm's capital structure, we present different slices of evidence and perform various robustness checks, using a set of closely related proxy variables for the concepts of interest. One particular methodological challenge in this research field is to overcome the endogeneity problem between capital structure and product markets. Arping and Lóránth (2006) discuss the example of Apple, which made its software more compatible with that of Microsoft when it became financially distressed. In this way, customer liquidation costs could be reduced. So, for mature firms, the size of NFS liquidation costs and – more generally – the firm's operating strategy can be affected by its financial history. Similar arguments can be made regarding NFS bargaining power. For instance, Hirsch (1991) suggests that firm profitability positively affects the degree of labor unionization. In their robustness checks, Kale and Shahrur (2006) take this potential endogeneity problem into account by lagging explanatory variables and by estimating a simultaneous equations model for leverage and customer/supplier R&D intensity, respectively. This study takes a different approach by examining first-time business start-ups that decide on their initial financial structure *before* entering product markets.

As all firms in our sample are private companies, we use book value measures to define the capital structure variables. Starting from the first-year balance sheet, we re-calculate the initial financial structure as closely as possible to the moment of start-up by disregarding changes in equity due to retained earnings. Also, loans extended by the entrepreneurs themselves are considered to be equity rather than debt financing. Leverage is then defined as the ratio of outside debt to total financing sources. For the debt mix, we calculate the ratio of bank loans to total debt. Bank debt maturity is measured as the ratio of long-term bank debt (> 1 year) to total bank debt.[9]

[9] The financial statements only distinguish between short-term and long-term debt using a one-year dividing line. However, Barclay and Smith (1995), in their study of the debt maturity structure in listed US firms, find that results are qualitatively similar for one, two, three, four and five-year maturity dividing lines.

The test variables, NFS liquidation costs and NFS bargaining power, are difficult to measure. Furthermore, some proxy variables used in prior empirical work (e.g., R&D expenses) are not generally available for European companies due to some minor differences in financial reporting. For the business start-ups in our sample, the information available in financial statements is further reduced as small firms are allowed to file abbreviated annual accounts.[10] However, Kale and Shahrur (2006) document that information that is typically not reported in the annual accounts may very well capture NFS relationship costs. This study therefore combines financial statement information with a set of new proxy variables that are calculated from the PASO START survey database. As the survey contains unique and detailed information on the start-up's relationships with NFS and input and output market strategies, it is well suited to test our hypotheses. Table 3 provides summary statistics on the survey questions that are relevant for this study on NFS liquidation costs and bargaining power. For a few questions, the response rate was less than 100% (see the last column of Table 3) and there we imputed the sample mean instead.

<<Insert Table 3>>

Each of the questions capturing NFS liquidation costs is related to the concept of relationship-specific investments, but has a slightly different interpretation. We hereby assume that when products/services are unique and production processes/technologies are new or advanced, all non-financial stakeholders (customers, suppliers and employees) have to make firm-specific investments. As the bargaining power of the various NFS is not necessarily highly related, we separately calculate measures for customer, supplier and employee bargaining power.[11] In order to

[10] Firms are classified as large if they have either more than 100 employees or if they exceed at least two of the following three criteria: (a) more than 50 employees, (b) sales (excluding VAT) exceeding €7,300,000 and (c) total assets exceeding €3,650,000. Only large firms are required to file detailed financial statements.

[11] Consistent with our approach, the theoretical literature on NFS liquidation costs (e.g., Titman, 1984) does not distinguish between customers, suppliers or employees either. Similarly, the contributions linking NFS bargaining power to capital structure always focus on one specific NFS category, e.g., employees in Bronars and Deere (1991) and input suppliers in Sarig (1998).

effectively summarize the relevant information in the survey questions, we perform separate factor analyses on the set of questions measuring NFS liquidation costs, customer bargaining power and employee bargaining power, respectively. Factor analysis is based on the idea that the correlations within a set of selected variables are due to some common underlying (and unobservable) forces. Hence, the underlying factors that best explain the correlations among variables are being extracted by means of this technique (see also Titman and Wessels, 1988). For supplier bargaining power, we use a dummy variable that equals one when the firm buys its main inputs from only one supplier ("single sourcing") and zero otherwise. The latter variable is related to the measure used by Kale and Shahrur (2006), who proxy supplier bargaining power by the concentration ratio in supplier industries. As a robustness check, we also discuss the correlation and OLS coefficients when using the individual survey questions to capture NFS relationship costs (see Section 5.5). As expected, our measures of NFS liquidation costs and bargaining power are not highly related.

The results of the factor analyses for NFS liquidation costs, customer and employee bargaining power are reported in Table 4. We retain the factor with the highest eigenvalue from each analysis and investigate hereafter whether the sign of the factor loadings, which measure the contribution of a particular survey question to a certain factor, is consistent with the concept of interest. Table 4 shows that firms scoring high on the NFS liquidation cost variable have unique products/services that are difficult to copy. These firms have no problems differentiating themselves from their competitors and strongly emphasize as well as use new or advanced processes and technologies. Overall, these results convincingly support our conjecture that NFS have to make large relationship-specific investments and thus face high liquidation costs when the proxy for NFS liquidation costs is high.

Firms with a high value for customer bargaining power show a large involvement of customers in their strategic and product market decisions. These firms regularly consult their customers, and incorporate information on customer needs, tastes and preferences into their operating decisions. Furthermore, these firms pay close attention to changes in customer

preferences and are very responsive to changes in customer needs. Finally, firms that score high on the employee bargaining power measure have to deal with a unionized workforce that is highly involved in the firm's day-to-day operations.[12]

<<Insert Table 4>>

Finally, we select control variables for the leverage, debt mix and maturity structure equations from the existing literature. Prior studies have found that the collateral value of assets, profitability, growth opportunities, risk and firm size are significant determinants of capital structure. For business start-ups, we expect that these variables will also be important as agency problems with creditors cannot be ignored, given these firms high default risk and large information asymmetries (see also Huyghebaert and Van de Gucht, 2006). Since start-ups have no history, historical firm-level data are not available to calculate these control variables. Furthermore, using data on asset structure from the start-up year could result in serious endogeneity problems. Therefore, except for firm size, we decided to measure the control variables at the corresponding five-digit NACE industry level. For this purpose, we use information on the population of business start-ups that started one year before our sample (i.e. October 2000 to October 2001). Collateral value is measured as fixed assets to total assets. Profitability is calculated by EBITDA to total assets. Growth opportunities are proxied by the sales growth rate. Risk is captured by the average percentage of start-up firms with negative cash flows in the industry; here, we calculate this

[12] Employee involvement is considered to be a supplementary mechanism to union representation (see also Brewster *et al.*, 2004). Helper *et al.* (2002) describe the relation between employee involvement and employee bargaining power as follows: *"Employee involvement can increase worker bargaining power by increasing workers' feeling of solidarity due to increased interaction. Involvement might also increase workers' firm-specific knowledge, which can make it difficult to replace workers and makes firms rely upon senior workers to train new employees. Involvement might also make it more difficult to monitor workers' actions, so that high productivity increasingly relies on worker cooperation. Finally, involvement might make it easier for employees to disrupt the production process, so that worker non-cooperation or other reactions to perceived unfairness is more costly to the firm."*

measure over 1996–2001 to improve its reliability. We also have tested the robustness of our conclusions by including industry dummy variables in addition to the above control variables. Finally, firm size is measured by the log of total assets in the start-up year. Table 5 summarizes the control variables and presents descriptive statistics and their expected relation with the capital structure variables.

<<Insert Table 5>>

To allow for a consistent comparison of the results, we decided to include all five above-discussed control variables in all three regression equations. Note that multicollinearity is not a problem in our study as variance inflation factors are all below five (Judge *et al.*, 1988). Some recent studies (e.g., Istaitieh and Rodriguez, 2003; Johnson, 2003; MacKay, 2003; Huyghebaert and Van de Gucht, 2006) integrate the interdependencies between the various capital structure components into their estimation framework by using a simultaneous equations methodology. The conditions of such a model are very demanding, however. Yet, MacKay (2003) and Huyghebaert and Van de Gucht (2006) find that even though various capital structure aspects are jointly determined, using an OLS model to estimate the impact of exogenous variables does not largely affect the results. Hence, we use a cross-sectional OLS regression analysis to estimate the model and test the robustness of our conclusions after taking into account the interactions between various capital structure variables.

## 5. Empirical Results

In this section, we look at how NFS liquidation costs (Section 5.1) and NFS bargaining power (Section 5.2) affect a firm's initial capital structure. Table 6 contains the results from these regression models. Furthermore, we test whether these concepts also have a joint impact on capital structure, in Section 5.3. The results of these models, where we thus include interaction terms between NFS liquidation costs and NFS bargaining power are presented in Table 7. The control

variables are discussed in Section 5.4. Finally, Section 5.5 provides robustness checks and additional analyses.

<<Insert Tables 6 and 7>>

## 5.1. NFS LIQUIDATION COSTS

In line with earlier findings by Titman and Wessels (1988), Opler and Titman (1994) and Kale and Shahrur (2006) on listed firms, we find that first-time business start-ups also have significantly lower debt ratios when NFS liquidation costs are large (see Columns 1–3 of the leverage equation in Table 6). This result confirms our first hypothesis that newly established entrepreneurial ventures choose a capital structure that lowers their probability of bankruptcy and thus liquidation when NFS face high liquidation costs, ceteris paribus. As argued earlier, in a country with a creditor-oriented bankruptcy procedure, like Belgium, bankruptcy almost always ends in the firm's liquidation rather than reorganization. This result is not only statistically, but also economically significant. A firm with NFS liquidation costs one standard deviation higher than an otherwise identical firm has between 4.18% and 4.64% less debt outstanding. Furthermore, this relation is robust to the exclusion of each individual survey question from the factor analysis for NFS liquidation costs, as reported in Table 4.

We find a similar albeit somewhat weaker negative effect of NFS liquidation costs on the debt mix (see Columns 1–3 of the debt mix equation in Table 6). A firm with NFS liquidation costs one standard deviation higher than an otherwise identical firm has between 3.05% and 3.75% less bank loans relative to total debt outstanding. Again, this relation continues to hold after excluding variables one-by-one from the NFS liquidation cost factor analysis. Finally, we do not find a significant effect of NFS liquidation costs on bank debt maturity (see Columns 1–3 of the maturity structure equation in Table 6).

Overall, these results indicate that in the case of first-time business start-ups limiting the debt ratio does not suffice to curb the negative impact of NFS liquidation costs on firm value.

Indeed, and consistent with our arguments, these firms also take their debt composition into account when NFS are likely to face high liquidation costs. Furthermore, the results suggest that once the fraction of bank loans has been limited, start-ups no longer (need to) adjust bank debt maturities to deal with NFS liquidation costs.

### 5.2. NFS BARGAINING POWER

In this section, we test Hypothesis 2, i.e. start-up firms reduce their leverage and proportion of bank debt, and lengthen bank debt maturities to deal with more powerful non-financial stakeholders. The discussion is divided into three parts, as we have data on the bargaining power of customers, suppliers and employees, respectively.

As for the customers, Column 1 of each capital structure equation in Table 6 provides the answers. We find that customer bargaining power is significantly negatively related to the debt ratio and the proportion of bank loans in total debt. A one standard deviation increase in customer bargaining power lowers the debt ratio by 3.14% and the proportion of bank loans by 4.95%. This result is consistent with Sarig's (1998) claim that firms reduce their probability of being liquidated when customers can threaten the firm's survival. However, the finding that customer bargaining power is significantly negatively related to bank debt maturity is not in line with Hypothesis 2.

The results for supplier bargaining power are presented in Column 2 of each equation. Again, we find that supplier bargaining power is significantly negatively related to the debt mix, consistent with Hypothesis 2.[13] A start-up firm that buys its inputs from a single supplier has 13.30% less bank loans outstanding relative to total debt, ceteris paribus. The results for employee bargaining power (reported in Column 3 of each capital structure equation) are not significant.

[13] An alternative explanation for the negative relation between supplier bargaining power and debt mix might be that suppliers with strong bargaining power grant less trade credit. However, we find no support for this conjecture as the correlation coefficient between supplier bargaining power and the number of days of supplier credit is insignificantly positive.

In sum, whereas we never find a significant impact of employee bargaining power on initial capital structure, we do find that firms reduce the proportion of bank loans in total debt when customers and suppliers have strong bargaining power, ceteris paribus. Also, when customers are in a strong bargaining position, business start-ups reduce their leverage. These results are consistent with the idea that entrepreneurs worry about liquidation following default on their bank debt and hence, choose an appropriate debt mix in order to reduce the likelihood that suppliers of specialized factors of production suspend their supplies upfront. Consistent with Section 5.1, the results again indicate that firms no longer (need to) adjust their bank debt maturities when the proportion of bank debt is limited.

Our findings for the relation between employee bargaining power and capital structure are consistent with those of Fan *et al.* (2004). These authors examine the effect of the level of statutory protection offered by unions and find no impact on leverage. Nevertheless, Kale and Shahrur (2006) document a positive relation between supplier and customer concentration and leverage. So, their results are consistent with the models of Bronars and Deere (1991), Dasgupta and Sengupta (1993) and Perotti and Spier (1993). However, Kale and Shahrur examine listed firms, which already have established relationships with their NFS and thus may have incentives to change their capital structure ex post in order to reduce the amount of rents these NFS can extract from the firm. In contrast, our sample firms still have to convince NFS to enter into contracting relationships with the entrepreneur. Furthermore, when firms are concerned about their liquidation, which is likely to hold more in the case of newly established entrepreneurial ventures when compared with listed firms, they may limit leverage to curb NFS bargaining power. Therefore, our findings do not contradict those of Kale and Shahrur (2006), but rather illustrate the unique context of entrepreneurial ventures. For entrepreneurs in first-time business start-ups, liquidation is a serious threat and firms are more likely than not to worry about fierce bank liquidation policies (e.g., Franks and Sussman, 2005).

## 5.3. INTERACTION BETWEEN LIQUIDATION COSTS AND BARGAINING POWER

As an additional test of the NFS liquidation cost theory, we conjecture that the effect of NFS liquidation costs on capital structure is strengthened when non-financial stakeholders are in a strong enough bargaining position to affect the firm's profitability (Hypothesis 3). In that case, NFS can be expected to pass on more easily their liquidation costs to the firm, ceteris paribus. To investigate this idea, we include interaction terms between NFS liquidation costs and the different measures of customer, supplier and employee bargaining power in Table 7. We find some limited support for our third hypothesis as the interaction term between NFS liquidation costs and supplier bargaining power is negative and significant in the leverage equation.

The interaction terms between NFS liquidation costs and customer/employee bargaining power are not significantly related to the capital structure variables.[14] An explanation could be that these NFS are able to fully charge their expected liquidation costs when they enter into a relationship with the start-up firm, independent of their bargaining power. As an example, firms usually provide guarantees and after-sales services for their products without additional charges, and pay for the job-related training of employees. Alternatively, the insignificance of the interaction term between NFS liquidation costs and employee bargaining power may be due to the fact that employee bargaining power was never significant in Table 6.

## 5.4. CONTROL VARIABLES

The discussion of the control variables is based on the parameter estimates in Table 6.[15] First, we find that business start-ups in industries where assets have a higher collateral value have more bank debt outstanding. From the supply side, banks may be wary of lending to first-time business start-

[14] The insignificance of NFS liquidation costs in Column 2 of the leverage and debt mix equations in Table 7 can be explained by its relatively high correlation coefficient with the interaction term *NFS liquidation costs * supplier bargaining power*. Yet, as the variance inflation factors are always below five, these regressions do not suffer from a multicollinearity problem (Judge *et al.*, 1988).

ups. As these firms are surrounded by high ex-ante failure risk and information asymmetries, adverse selection problems are likely to be an important consideration for banks. Besides, moral hazard problems (such as risk shifting and underinvestment) may also be sizeable for these firms, especially when heading towards financial distress. However, when assets have a high collateral value, banks are able to reduce their exposure to these problems by securing their loans. We also find that the collateral value of assets is significantly positively related to bank debt maturity, which is consistent with our supply-driven explanation for the sign of this variable in the debt mix equation. An alternative (demand-driven) explanation for the maturity structure result may be that first-time entrepreneurs fear banks will liquidate their firm prematurely following default when assets have a high collateral value (e.g., Hart, 1995; Manove *et al.*, 2001). Finally, the collateral value of assets is not significantly related to the debt ratio, which is at odds with the positive and significant relation found for mature listed firms (e.g., Rajan and Zingales, 1995; Wald, 1999). However, for business start-ups that do not have access to public debt markets, trade credit is an important component of the debt ratio.

Firms operating in more profitable industries have a lower proportion of bank loans. Yet, profitability does not significantly affect bank debt maturity structure or leverage. Growth opportunities when measured at the industry level have no significant impact on initial financing decisions of business start-ups. In line with earlier findings of Bradley *et al.* (1984) and Wald (1999), among others, we find that firms in risky industries raise significantly less debt financing. Our results for risk also indicate that banks abstain from lending to business start-ups in risky industries as the coefficient of risk is significantly negative in the debt mix equation. Risk does not significantly affect the maturity structure of bank debt, suggesting that once the size of the bank loans has been limited there is no further need to reduce bank debt maturity. These findings are robust to alternative definitions of risk, such as the industry failure rate and the variance of cash flows within the corresponding industry during 1996–2001. Overall, these results stress the

[15] Overall, the conclusions from the control variables continue to hold in Table 7.

importance of risk as a determinant of initial capital structure in business start-ups. Indeed, given these firms' high default risk, potential agency problems with creditors cannot be ignored (see also Huyghebaert and Van de Gucht, 2006). Overall, these results are robust when using the entire population of industry incumbents during 1996–2001 to measure the control variables.

Finally, consistent with earlier research for mature listed firms (e.g., Titman and Wessels, 1988; Rajan and Zingales, 1995; Wald, 1999; Cassar, 2004), larger business start-ups have significantly more debt outstanding. In the bankruptcy costs literature, this is explained by the negative relation between firm size and the probability of bankruptcy and by the notion that direct bankruptcy costs constitute a larger proportion of firm value for smaller firms. Yet, start-ups with a larger need for external financing may have to raise their leverage when debt is the main source of external financing. Additionally, we find that larger business start-ups have a larger proportion of bank loans, ceteris paribus.

### 5.5. ROBUSTNESS CHECKS AND ADDITIONAL ANALYSES

In this section, we report the results from various robustness checks and additional analyses.

First, we examine the robustness of our results in Sections 5.1 and 5.2 when using the individual survey questions to measure the test variables. For this purpose, we present the correlation coefficients and OLS parameter estimates of all individual survey variables used in the previous analyses. The results for NFS liquidation costs and NFS bargaining power are reported in Tables 8 and 9, respectively. The OLS coefficients in Tables 8 and 9 are obtained by replacing either NFS liquidation costs (Table 8) or NFS bargaining power (Table 9) by the corresponding survey variable. We use the first capital structure equation from Table 6 to estimate the models (the results are largely similar when using the other two equations).

<<Insert Tables 8 and 9>>

The correlation coefficients and OLS parameter estimates for the NFS liquidation cost variables (Table 8) largely confirm our earlier conclusions. If products or services are more unique,

difficult to copy and/or differentiated from those of competitors or if entrepreneurs emphasize or use new/advanced processes and technologies, these start-up firms will have a lower debt ratio, ceteris paribus. The results in the debt mix equation show that the explanatory power of the individual survey questions is weaker, thereby demonstrating the power of factor analysis that pools the underlying common factor. Yet, when products are differentiated from those of competitors or when firms emphasize/use new/advanced processes and technologies, business start-ups have a lower proportion of bank loans. Consistent with our earlier conclusions in Tables 6 and 7, none of the individual survey variables is significantly related to the bank debt maturity structure.

In Table 9, we look at the effects of the constituting survey questions in the factor analyses for customer and employee bargaining power, respectively. For the variables underlying our customer bargaining power measure, we find that the more customers are involved in future product decisions, the lower is leverage and debt mix, ceteris paribus. The proportion of bank loans in total debt outstanding is also lower when the management frequently discusses changes in consumers' needs with employees and when the firm explicitly checks whether customers are satisfied with the quality of its products/services. Finally, the maturity structure equation reveals that the negative coefficient of customer bargaining power in Tables 6 and 7 is driven by the survey question examining future customer demands. Overall, the results are strongest for the debt mix equation, which is consistent with our earlier findings in Tables 6 and 7.

Table 9 also reports the effects of the individual survey questions underlying the factor analysis for employee bargaining power. A measure for employee bargaining power that has received a lot of attention in the literature is the degree of unionization (e.g., Bronars and Deere, 1991). Our dataset contains a similar measure, i.e. the percentage of employees who are members of a union. Row 6 in Table 9 shows that the unionization rate does not affect a firm's financing decisions, consistent with our earlier conclusions in Tables 6 and 7. Finally, the level of employee involvement does not significantly affect initial capital structure, except for the significantly positive parameter estimate in the debt mix equation.

Next, we examined whether the results differ when using customer identity (individuals versus firms/governments) as a proxy for NFS liquidation costs. Professional customers are likely to have higher relationship-specific investments (liquidation costs) as they use the start-up's product or service as an intermediate input in their own production process. In our sample, 32.88% of firms realize more than 25% of their sales from dealing with other corporations or the government. In an unreported OLS regression analysis based on Table 7 but using customer identity to proxy for NFS liquidation costs, we find that the percentage of sales to professional clients is significantly negatively related to leverage and the proportion of bank debt in total debt. So, these results confirm earlier findings and conclusions.

As we find that NFS relationship costs significantly affect both leverage and debt mix, and as these capital structure components are often jointly determined (e.g., Istaitieh and Rodriguez, 2003; Johnson, 2003; MacKay, 2003; Huyghebaert and Van de Gucht, 2006), we also estimate a model where the interactions between leverage and debt mix are taken into account. For this purpose, we use an instrumental variable approach, to take into account the earlier-pointed out endogeneity of capital structure. Hence, start-up leverage and debt mix are estimated as a function of their corresponding industry-level variables. Yet, this approach resulted in multicollinearity problems, making the capital structure components and control variables insignificant. Hence, we re-estimated the model by instrumenting the residuals of a first-step regression that removes the effects of the above explanatory variables on the corresponding industry-level capital structure components. Table 10, which reports the results, shows that our conclusions are robust.

<<Insert Table 10>>

We also estimated the models in Tables 6 and 7 for the subsample of newly established firms that are not first-time entrepreneurial start-ups in the PASO START database (638 – 223 = 415 firms are included in this database). These companies represent new divisions of existing companies, split-ups of other firms and companies that changed their type of incorporation. Hence, these firms have already built up a reputation in input and output markets and face smaller default

risk (e.g., Dunne *et al.*, 2005). Overall, we find that NFS liquidation costs and NFS bargaining power are not significantly related to initial capital structure decisions in this sample (not reported).

Finally, split-sample regressions – using firm size, time of start-up within the sampling period, and degree of competition within the industry – do not yield any significant differences.

## 6. Conclusions

The empirical capital structure literature to date has not paid much attention as to how relationships with non-financial stakeholders (NFS) may affect financing decisions. Yet, establishing long-term relationships with customers, suppliers and employees is crucial to the success of every firm. Business start-ups and their entrepreneurs lack history and reputation in both input and output markets. Start-up ventures are also characterized by a high ex-ante failure risk. Establishing relationships with newly established firms is therefore a high-risk venture for NFS, especially when they have to make large firm-specific investments that can be lost upon the firm's liquidation. Titman (1984), among others, argues that as capital structure controls the future liquidation decision, firms with large NFS liquidation costs may limit their debt ratio. Other theoretical papers show that firms tune their capital structure to the size of NFS bargaining power, either to reduce the surplus to be bargained on (e.g., Bronars and Deere, 1991; Dasgupta and Sengupta, 1993; Perotti and Spier, 1993) or to limit their vulnerability to strategic actions by NFS (e.g., Sarig, 1998). This paper provides compelling statistical evidence that NFS relationship costs are a significant determinant of initial financing decisions in newly established entrepreneurial ventures, thereby contributing to the literature on the interactions between product and financial markets.

First, consistent with Titman (1984) and others, we find that the size of NFS liquidation costs is significantly negatively related to leverage and the proportion of bank loans in total debt outstanding. Supplier bargaining power has an impact on the relation between NFS liquidation costs and capital structure, as start-ups reduce their reliance on bank loans when NFS liquidation costs are high especially when suppliers have large bargaining power. By contrast, the interaction

terms between NFS liquidation costs and customer/employee bargaining power are never significant. Third, leverage is reduced when customer bargaining power is high whereas customer and supplier bargaining power also negatively affect a start-up's reliance on bank debt. These results support Sarig's (1998) conjecture that entrepreneurs, being concerned about strict bank liquidation policies, reduce their vulnerability to strategic actions from NFS by adjusting their capital structure.

Arguably, our findings also have some public policy implications for governments and other institutions concerned with entrepreneurship. They suggest that the availability of easy accessible outside equity financing could be an important impetus to entrepreneurship, especially in markets where relationships with NFS are important, but strenuous. The reason is not so much to provide a buffer against first-year losses – as focused upon in the available literature to date – but rather to induce NFS to establish long-term relationships with newly founded ventures. As the importance of relationships w, supply chain innovations, etc., we believe that the value added from incorporating these NFS relationship costs into capital structure decisions has grown over time and will continue to do so. Overall, our results and conclusions may also be relevant in other situations where firms lack reputation and failure risk is important (e.g., entry into new markets).

Finally, our empirical findings also indicate some avenues for further research. Do start-ups that pay more attention to NFS liquidation costs and NFS bargaining power have a higher probability of being successful? Survival analysis could provide an answer to such a question. Are there other ways, besides adjusting capital structure, to decrease the impact of NFS relationship costs on firm value and survival? In this respect, Arping and Lóránth (2006) show that firms can also mitigate NFS concerns about their long-term viability by reducing the very uniqueness of their products. This result is important in the context of business start-ups, especially in traditional sectors, as debt financing usually is the only available source of outside financing. Furthermore, our results suggest a role for trade credit to reduce customer concerns about liquidation.

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*Figure 1.* Industry distribution of first-time business start-ups

This figure presents the industry distribution of our sample of 209 first-time business start-ups and compares this with the industry distribution of the population of Belgian firms and Belgian start-ups during the sampling period. All sample firms are incorporated in Belgium and started their operations between October 2001 and October 2002. The sample is constructed from the PASO START database (*www.paso.be*).

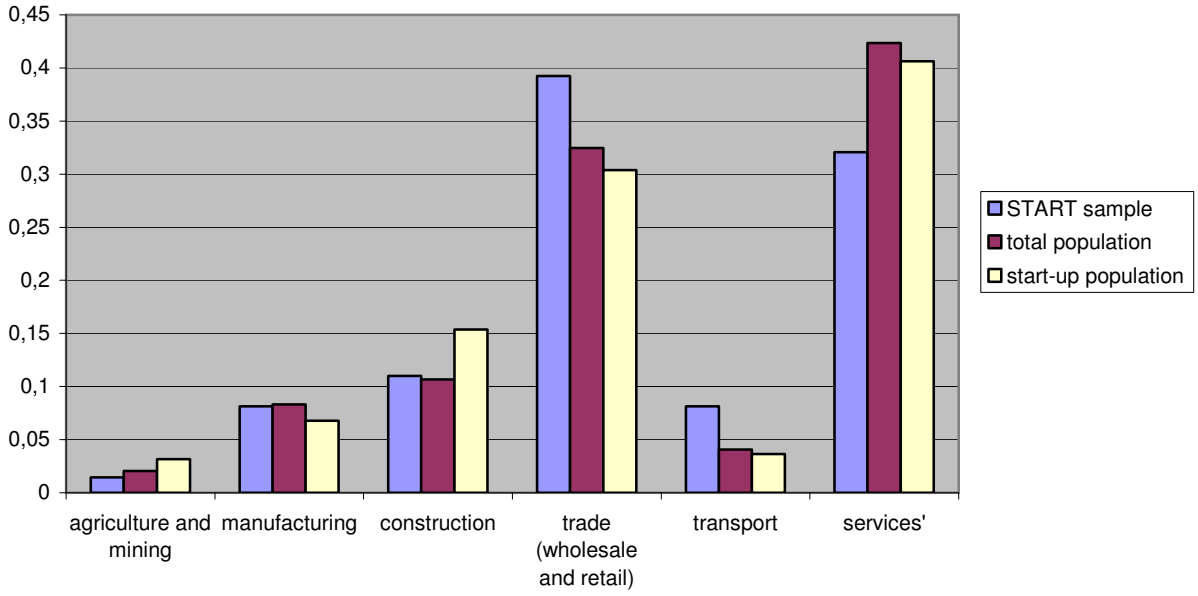


*Table 1.* Summary of the hypotheses

$$CS_{ij} = a_{i1} + a_{i2} * LC_j + a_{i3} * BP_j + a_{i4} * (LC_j * BP_j) + \sum_{l=1}^{L} b_{li} X_{lj}$$

with: $CS_{ij}$ = capital structure variable $i$ (i=1: leverage; i=2: debt mix; i=3: maturity) of firm $j$

$LC_j$ = proxy variable for NFS liquidation costs in firm $j$

$BP_j$ = proxy variable for NFS bargaining power in firm $j$

$X_{lj}$ = set of $L$ control variables for capital structure variable $i$ of firm $j$

| **Hypotheses** | **Leverage** (debt/total financing sources)<br>*The larger leverage, the higher the probability of liquidation.* | **Debt mix** (bank debt/total debt)<br>*The larger debt mix, the higher the probability of liquidation.* | **Maturity** (LT bank debt/total bank debt)<br>*The longer maturity, the lower the probability of liquidation.* |
|---|---|---|---|
| **1. Liquidation costs**<br>*"The higher NFS liquidation costs, the lower the probability of liquidation"* [Titman, 1984] | $a_2 < 0$ | $a_2 < 0$ | $a_2 > 0$ |
| **2. Bargaining power**<br>*"The stronger NFS bargaining power is, the more firms will reduce their financial vulnerability"* [Sarig, 1998] | $a_3 < 0$ | $a_3 < 0$ | $a_3 > 0$ |
| **3. Liquidation costs * Bargaining power**<br>*"Liquidation costs affect capital structure to a larger extent if NFS have strong bargaining power"* | $a_4 < 0$ | $a_4 < 0$ | $a_4 > 0$ |

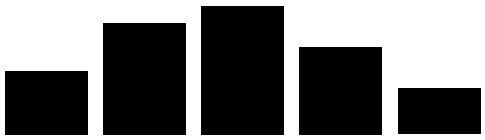
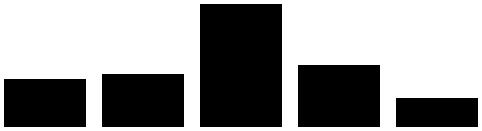
*Table 2.* Characteristics of the start-up firms

This table provides descriptive statistics for the sample of 209 first-time business start-ups that is constructed from the PASO START database. All sample firms are incorporated in Belgium between October 2001 and October 2002. The descriptive characteristics are based on the financial statements of the first available accounting year. Total financing sources is the sum of outside (i.e. non-entrepreneurial) debt and entrepreneurial loans and equity. Inside debt includes the loans that are extended by the entrepreneurs to their own firm. The other variables are self-contained.

| | Mean | median | $5^{th}$ pctl | $95^{th}$ pctl | std. dev |
|---|---|---|---|---|---|
| *FIRM SIZE* | | | | | |
| Number of employees | 5.9882 | 3 | 1 | 21 | 11.6471 |
| Total assets (€) | 488827 | 179500 | 32000 | 1592000 | 1177220 |
| Total financing sources (€) | 493293 | 184000 | 39000 | 1699000 | 1204680 |
| *ASSET STRUCTURE* | | | | | |
| Tangible fixed assets/total assets | 0.3532 | 0.3027 | 0.0200 | 0.8526 | 0.2643 |
| Inventories/total assets | 0.1841 | 0.1244 | 0.0068 | 0.5831 | 0.1846 |
| Cash and marketable securities/total assets | 0.1448 | 0.0966 | 0.0032 | 0.4560 | 0.1528 |
| *FINANCIAL STRUCTURE* | | | | | |
| Leverage: outside debt/total financing sources | 0.6084 | 0.6833 | 0.0914 | 0.9329 | 0.2690 |
| Debt mix: bank debt/total debt | 0.3612 | 0.3357 | 0 | 0.8801 | 0.3052 |
| Trade credit/total debt | 0.2390 | 0.1611 | 0.0049 | 0.6988 | 0.2459 |
| Inside debt/total debt | 0.1712 | 0.0526 | 0 | 0.6977 | 0.2426 |
| LT debt (>1 year)/total debt | 0.3093 | 0.2635 | 0 | 0.8554 | 0.3003 |
| Maturity structure: LT bank debt (>1 year)/bank debt | 0.8217 | 1 | 0 | 1 | 0.3271 |

*Table 3.* Characteristics of the proxy variables

This table contains descriptive statistics on NFS liquidation costs and NFS bargaining power variables for the sample of 209 first-time business start-ups. All variables are collected from the PASO START database and represent the relationship costs of customers (C), suppliers (S) and employees (E). Block diagrams represent the frequency of answers to the questions that had to be answered on a five-item Likert scale. This scale varies from completely disagree (at the left) to completely agree (at the right).

| Type of NFS* | Statement/Question | Responses (left: completely disagree, right: completely agree) | N |
|---|---|---|---|
| **NFS Liquidation Costs** | | | |
| C/S/E | Our products/services are unique in comparison to those of competitors. |  | 209 |
| C/S/E | It is difficult for our competitors to copy our products. |  | 209 |
| C/S/E | Our firm has no problems differentiating itself from its main competitors. |  | 209 |
| C/S/E | Our firm strongly emphasizes new/advanced processes and technologies. |  | 209 |
| C/S/E | Our firm uses new or advanced technologies. |  | 209 |
| C/S/E | % of firm goods that are customer-specific. |  | 209 |
| **NFS Bargaining Power** | | | |
| C | Management frequently discusses changes in consumers' needs with employees. |  | 209 |
| C | At least once a year we invite customers in order to find out which products/services they need in the future. |  | 209 |
| C | We pay little attention to changes in the preferences of our customers. |  | 209 |

| | | | |
|---|---|---|---|
| C | We have a tendency to neglect important changes in our customers' needs. |  | 196 |
| C | At least once a year we check whether customers are satisfied with the quality of our products/services. |  | 209 |
| S | Single sourcing: The firm has only one supplier for its main inputs. (0: no, 1: yes) | 40.89% of firms have only one supplier for their main inputs. | 203 |
| E | Percentage of employees within the firm who are members of a union. (left: 0, right 100%) |  | 173 |
| E | Employee involvement: How strong are employees' decision powers and responsibilities? (left: very weak, right: very strong) |  | 209 |

*Table 4.* Factor analysis for NFS liquidation costs and NFS bargaining power

These tables report the results of the factor analyses for NFS liquidation costs, customer bargaining power and employee bargaining power, which are performed on the sets of variables that are described in Table 3. The factor loading of a variable describes the relation between that variable and the underlying (unobservable) theoretical construct, i.e. factor. Kaiser's measure indicates the sampling adequacy for each factor (cut-off 0.5).

| Factor "Liquidation cost" | Factor loading | Kaiser's measure |
|---|---|---|
| Our products/services are unique in comparison to those of competitors. | 0.7447 | 0.7213 |
| It is difficult for our competitors to copy our products. | 0.6224 | 0.7254 |
| Our firm has no problems differentiating itself from its main competitors. | 0.5548 | 0.7326 |
| Our firm strongly emphasizes new/advanced processes and technologies. | 0.7213 | 0.5931 |
| Our firm uses new/advanced processes and technologies. | 0.7244 | 0.5948 |
| % of firm goods/services that are customer-specific. | 0.1982 | 0.7138 |
| Kaiser's measure of sampling adequacy: Overall MSA = 0.6548 | | |
| Number of factors with eigenvalue > 1: 2 | | |
| Eigenvalue factor "Liquidation costs" = 2.3340, eigenvalue factor 2 = 1.2478 | | |

| Factor "Customer bargaining power" | Factor loading | Kaiser's measure |
|---|---|---|
| Management frequently discusses changes in consumers' needs with employees. | 0.7484 | 0.6772 |
| At least once a year we invite customers in order to find out which products/services they need in the future. | 0.6958 | 0.6707 |
| We pay little attention to changes in the preferences of our customers. | -0.4822 | 0.6164 |
| We have a tendency to neglect important changes in our customers' needs. | -0.2350 | 0.5283 |
| At least once a year we check whether customers are satisfied with the quality of our products/services. | 0.7275 | 0.6541 |
| Kaiser's measure of sampling adequacy: Overall MSA = 0.6493 | | |
| Number of factors with eigenvalue > 1: 2 | | |
| eigenvalue factor "Customer bargaining power" = 1.8611, eigenvalue factor 2 = 1.1791 | | |

| Factor "Employee bargaining power" | Factor loading | Kaiser's measure |
|---|---|---|
| Percentage of employees who are members of a union. (missing values imputed with mean value) | 0.5400 | 0.5465 |
| Employee involvement: How strong are employees' decision powers and responsibilities? | 0.6261 | 0.5295 |
| Kaiser's measure of sampling adequacy: Overall MSA = 0.5290 | | |
| Number of factors with eigenvalue > 1: 1 | | |
| eigenvalue factor "Employee bargaining power" = 1.2040 | | |

*Table 5.* Description of the control variables used in the estimations of the financial structure determinants

This table describes the control variables that are used in the estimations of the initial capital structure variables of first-time business start-ups. The sample of start-up firms is described in Table 3. Except for firm size, these control variables are measured at the five-digit NACE industry level. This data was obtained from the Belfirst database.

| Variable name | Description | Mean | median | std.dev | Lev | Mix | Mat |
|---|---|---|---|---|---|---|---|
| Collateral value | Industry mean of tangible fixed assets to total assets for all start-up firms (between 10/2000 and 10/2001) in the corresponding industry. | 0.3784 | 0.3720 | 0.1331 | + | + | + |
| Profitability | Industry mean of EBITDA to total assets for all start-up firms (between 10/2000 and 10/2001) in the corresponding industry. | 0.0646 | 0.0585 | 0.0779 | – | +/– | + |
| Growth Opportunities | Industry mean of sales growth during the first start-up year for all start-up firms (between 10/2000 and 10/2001) in the corresponding industry. | 0.3167 | 0.1691 | 0.7405 | – | +/– | – |
| Risk | The percentage of start-up firms with a negative cash flow during the first start-up year for all start-up firms in 1996–2001 in the corresponding industry | 0.2032 | 0.2043 | 0.0857 | – | – | +/– |
| Firm size | Logarithm of total assets in the start-up year | 5.2076 | 5.0173 | 1.2936 | + | + | + |

*Table 6.* The determinants of leverage, debt mix and bank debt maturity structure for start-up firms: The base model

This table presents the OLS regression estimates of the determinants of (1) leverage, (2) the debt mix, and (3) the maturity structure of bank debt in the start-up year for 209 first-time business start-ups. Leverage is the ratio of outside debt to total assets. Debt mix is the ratio of bank debt to total debt. Maturity structure is the ratio of long-term bank debt to total bank debt. The explanatory variables are described in Table 4 whereas the control variables are defined in Table 5. p-values are reported between parentheses.

| | Leverage proportion of total funds that is (outside) debt financing | | | Debt mix proportion of debt financing that is bank debt | | | Maturity structure proportion of bank debt that is long-term debt | | |
|---|---|---|---|---|---|---|---|---|---|
| Intercept | 0.4061 | 0.4039 | 0.3940 | 0.1044 | 0.0887 | 0.0931 | 0.6018 | 0.5889 | 0.6046 |
| | (0.0006) | (0.0012) | (0.0009) | (0.4522) | (0.5412) | (0.5087) | (0.0045) | (0.0078) | (0.0046) |
| NFS liquidation costs | -0.0306 | -0.0366 | -0.0361 | -0.0259 | -0.0320 | -0.0352 | 0.0489 | 0.0296 | 0.0358 |
| | (0.0837) | (0.0426) | (0.0387) | (0.1324) | (0.0812) | (0.0942) | (0.1361) | (0.3669) | (0.2689) |
| Customer bargaining power | -0.0317 | | | -0.0500 | | | -0.0636 | | |
| | (0.0739) | | | (0.0186) | | | (0.0522) | | |
| Supplier bargaining power | | -0.0626 | | | -0.1330 | | | 0.0320 | |
| | | (0.2701) | | | (0.0481) | | | (0.8016) | |
| Employee bargaining power | | | 0.0190 | | | 0.0052 | | | 0.0411 |
| | | | (0.2416) | | | (0.7911) | | | (0.1596) |
| Collateral value | -0.0015 | 0.0207 | 0.0252 | 0.5520 | 0.5839 | 0.5994 | 0.6761 | 0.8158 | 0.7235 |
| | (0.9917) | (0.8916) | (0.8624) | (0.0017) | (0.0013) | (0.0007) | (0.0086) | (0.0026) | (0.0050) |
| Profitability | -0.0037 | -0.0040 | -0.0038 | -0.0074 | -0.0071 | -0.0078 | -0.0034 | -0.0031 | -0.0036 |
| | (0.1750) | (0.1465) | (0.1580) | (0.0219) | (0.0307) | (0.0167) | (0.4860) | (0.5339) | (0.4539) |
| Growth opportunities | -0.0167 | -0.0169 | -0.0208 | -0.0313 | -0.0283 | -0.0352 | -0.0282 | -0.0222 | -0.0292 |
| | (0.4927) | (0.4961) | (0.3956) | (0.2824) | (0.3367) | (0.2330) | (0.5637) | (0.6548) | (0.5525) |
| Risk | -0.4650 | -0.5135 | -0.5007 | -0.7379 | -0.7427 | -0.7722 | 0.1393 | 0.0064 | 0.0555 |
| | (0.0314) | (0.0227) | (0.0213) | (0.0044) | (0.0054) | (0.0033) | (0.6996) | (0.9866) | (0.8794) |
| Firm size | 0.0677 | 0.0677 | 0.0684 | 0.0488 | 0.0472 | 0.0466 | -0.0159 | -0.0223 | -0.0184 |
| | (<0.0001) | (<0.0001) | (<0.0001) | (0.0022) | (0.0036) | (0.0043) | (0.5227) | (0.3778) | (0.4615) |
| Adjusted $R^2$ | 15.27% | 14.56% | 14.47% | 20.62% | 19.04% | 18.35% | 8.63% | 6.55% | 7.44% |

*Table 7.* The determinants of leverage, debt mix and bank debt maturity structure for start-up firms: Models with interaction terms

This table presents the OLS regression estimates of the determinants of (1) leverage, (2) the debt mix, and (3) the maturity structure of bank debt in the start-up year for 209 first-time business start-ups. Leverage is the ratio of outside debt to total assets. Debt mix is the ratio of bank debt to total debt. Maturity structure is the ratio of long-term bank debt to total bank debt. The explanatory variables are described in Table 4 whereas the control variables are defined in Table 5. p-values are reported between parentheses.

| | Leverage | | | Debt mix | | | Maturity structure | | |
|---|---|---|---|---|---|---|---|---|---|
| Intercept | 0.4072 | 0.4123 | 0.3884 | 0.10343 | 0.0884 | 0.0988 | 0.5971 | 0.5500 | 0.6010 |
| | (0.0006) | (0.0009) | (0.0011) | (0.4577) | (0.5436) | (0.4856) | (0.0050) | (0.0131) | (0.0046) |
| NFS liquidation costs | -0.0321 | -0.0241 | -0.0355 | -0.0245 | -0.0323 | -0.0358 | 0.0527 | 0.0180 | 0.0321 |
| | (0.0826) | (0.2044) | (0.0430) | (0.1044) | (0.1654) | (0.0897) | (0.1239) | (0.5922) | (0.3203) |
| Customer bargaining power | -0.0320 | | | -0.0497 | | | -0.0631 | | |
| | (0.0723) | | | (0.0198) | | | (0.0548) | | |
| Supplier bargaining power | | -0.0434 | | | -0.1335 | | | 0.0378 | |
| | | (0.4478) | | | (0.0514) | | | (0.7657) | |
| Employee bargaining power | | | 0.0173 | | | 0.0069 | | | 0.03931 |
| | | | (0.2957) | | | (0.7287) | | | (0.1758) |
| NFS liquidation costs * Customer BP | 0.0044 | | | -0.0040 | | | -0.0124 | | |
| | (0.7739) | | | (0.8236) | | | (0.6872) | | |
| NFS liquidation costs * Supplier BP | | -0.1061 | | | 0.0030 | | | 0.2269 | |
| | | (0.0594) | | | (0.9644) | | | (0.1555) | |
| NFS liquidation costs * Employee BP | | | 0.0090 | | | -0.0090 | | | 0.0475 |
| | | | (0.5695) | | | (0.6343) | | | (0.1045) |
| Collateral value | -0.0037 | 0.0490 | 0.0251 | 0.5541 | 0.5831 | 0.5995 | 0.6824 | 0.7963 | 0.7015 |
| | (0.9797) | (0.7470) | (0.8631) | (0.0017) | (0.0015) | (0.0007) | (0.0083) | (0.0032) | (0.0063) |
| Profitability | -0.0037 | -0.0039 | -0.0040 | -0.0074 | -0.0071 | -0.0078 | -0.0034 | -0.0025 | -0.0045 |
| | (0.1711) | (0.1627) | (0.1523) | (0.0234) | (0.0312) | (0.0180) | (0.4831) | (0.6251) | (0.3534) |
| Growth opportunities | -0.0172 | -0.0189 | -0.0202 | -0.0308 | -0.0282 | -0.03585 | -0.0266 | -0.0195 | -0.0282 |
| | (0.4831) | (0.4461) | (0.4113) | (0.2910) | (0.3393) | (0.2262) | (0.5876) | (0.6931) | (0.5630) |
| Risk | -0.4640 | -0.5040 | -0.4858 | -0.7389 | -0.7430 | -0.7872 | 0.1425 | -0.0080 | 0.0785 |
| | (0.0322) | (0.0244) | (0.0268) | (0.0044) | (0.0056) | (0.0030) | (0.6939) | (0.9831) | (0.8292) |
| Firm size | 0.0675 | 0.0634 | 0.0690 | 0.0489 | 0.0473 | 0.0460 | -0.0152 | -0.0139 | -0.0163 |
| | (<0.0001) | (<0.0001) | (<0.0001) | (0.0022) | (0.0041) | (0.0050) | (0.5433) | (0.5904) | (0.5122) |
| Adjusted $R^2$ | 14.87% | 15.72% | 14.17% | 20.23% | 18.61% | 18.02% | 8.08% | 7.27% | 8.54% |

*Table 8.* The determinants of leverage, debt mix and bank debt maturity structure for start-up firms: NFS liquidation costs

This table presents the correlation coefficients and OLS parameter estimates of the determinants of (1) leverage, (2) the debt mix, and (3) the maturity structure of bank debt in the start-up year for 209 first-time business start-ups. Leverage is the ratio of outside debt to total financing sources. Debt mix is the ratio of bank debt to total debt. Maturity structure is the ratio of long-term bank debt to total bank debt. Except for the NFS liquidation cost variable, we use the same set of explanatory and control variables as in Table 6 and as defined in Tables 4 and 5. We use the Pearson test for OLS parameter estimates and the t-test for OLS parameter estimates. p-values are reported between parentheses.

| **NFS LIQUIDATION COSTS** | **Leverage** | | **Debt mix** | | **Maturity structure** | |
|---|---|---|---|---|---|---|
| | **Correlation** | **OLS** | **Correlation** | **OLS** | **Correlation** | **OLS** |
| Our products/services are unique in comparison to those of competitors. | -0.1755<br>(0.0110) | -0.0273<br>(0.0660) | -0.0650<br>(0.3511) | 0.00238<br>(0.8975) | 0.0107<br>(0.8961) | 0.0035<br>(0.9016) |
| It is difficult for our competitors to copy our products. | -0.1184<br>(0.0877) | -0.0244<br>(0.0777) | -0.0916<br>(0.1884) | -0.0159<br>(0.3303) | 0.0293<br>(0.7212) | 0.01767<br>(0.4886) |
| Our firm has no problems differentiating itself from its main competitors. | -0.1380<br>(0.0463) | -0.0441<br>(0.0138) | -0.0892<br>(0.2000) | -0.0372<br>(0.0797) | 0.0409<br>(0.6181) | 0.0262<br>(0.4373) |
| Our firm strongly emphasizes new/advanced processes and technologies. | -0.1684<br>(0.0148) | -0.0350<br>(0.0219) | -0.1658<br>(0.0167) | -0.0254<br>(0.1624) | 0.0396<br>(0.6290) | 0.0164<br>(0.5563) |
| Our firm uses new/advanced processes and technologies. | -0.1280<br>(0.0649) | -0.0298<br>(0.0448) | -0.1457<br>(0.0358) | -0.0249<br>(0.1586) | 0.0317<br>(0.6995) | 0.0136<br>(0.6198) |
| % of firm goods that are customer-specific. | 0.0022<br>(0.9753) | -0.0001<br>(0.9156) | -0.0858<br>(0.2179) | -0.0006<br>(0.2637) | 0.1139<br>(0.1638) | 0.0011<br>(0.1730) |

*Table 9.* The determinants of leverage, debt mix and bank debt maturity structure for start-up firms: NFS bargaining power

This table presents the correlation coefficients and OLS parameter estimates of the determinants of (1) leverage, (2) the debt mix, and (3) the maturity structure of bank debt in the start-up year for 209 first-time business start-ups. Leverage is the ratio of outside debt to total financing sources. Debt mix is the ratio of bank debt to total debt. Maturity structure is the ratio of long-term bank debt to total bank debt. Except for the NFS bargaining power variable, we use the same set of explanatory and control variables as in Table 6 and as defined in Tables 4 and 5. We use the Pearson test for OLS parameter estimates and the t-test for OLS parameter estimates. p-values are reported between parentheses.

| **NFS BARGAINING POWER** | **Leverage** | | **Debt mix** | | **Maturity structure** | |
|---|---|---|---|---|---|---|
| | **Correlation** | **OLS** | **Correlation** | **OLS** | **Correlation** | **OLS** |
| Management frequently discusses changes in customers' needs with employees | -0.0471<br>(0.4981) | -0.0062<br>(0.6967) | -0.1970<br>(0.0043) | -0.0360<br>(0.0557) | -0.1568<br>(0.0545) | -0.0400<br>(0.1637) |
| At least once a year we invite clients to find out which products/services they need in the future | -0.1633<br>(0.0182) | -0.0355<br>(0.0078) | -0.2611<br>(0.0001) | -0.0453<br>(0.0039) | -0.2940<br>(0.0002) | -0.0736<br>(0.0025) |
| We pay little attention to changes in the preferences of our customers | 0.0060<br>(0.9310) | -0.016<br>(0.5044) | 0.0086<br>(0.9018) | -0.0050<br>(0.8041) | 0.0441<br>(0.5908) | 0.0073<br>(0.8333) |
| We have a tendency to neglect important changes in our customers' needs | 0.0302<br>(0.6747) | -0.00041<br>(0.9844) | 0.0249<br>(0.7301) | -0.0207<br>(0.3808) | 0.1169<br>(0.1676) | 0.0406<br>(0.2708) |
| At least once a year we check whether customers are satisfied with the quality of our products/services | -0.1012<br>(0.1447) | -0.0194<br>(0.1673) | -0.1372<br>(0.0482) | -0.0179<br>(0.2794) | -0.0512<br>(0.5325) | -0.0108<br>(0.6681) |
| Percentage of employees who are members of a union | -0.0023<br>(0.9741) | 0.0353<br>(0.4946) | 0.0355<br>(0.6113) | 0.0536<br>(0.3777) | 0.1324<br>(0.1050) | 0.1148<br>(0.2382) |
| Employee involvement: How strong are employees' decision powers and responsibilities? | -0.0397<br>(0.5683) | 0.0457<br>(0.7095) | 0.0496<br>(0.4768) | 0.2689<br>(0.0627) | 0.1106<br>(0.1763) | 0.2273<br>(0.2479) |

*Table 10.* The determinants of leverage and debt mix: Results of a simultaneous equations model with interaction terms

This table presents the OLS regression results of the determinants of leverage and the debt mix in the start-up year for 209 first-time business start-ups. Leverage is the ratio of outside debt to total assets. Debt mix is the ratio of bank debt to total debt. The explanatory variables leverage and debt mix are the results of a regression on the control variables and are instrumented on industry leverage and industry debt mix, respectively. Other explanatory variables are described in Table 4 whereas the control variables are defined in Table 5. p-values are reported between parentheses.

| | **Leverage** | | | | | | **Debt mix** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Intercept | 0.3685 | 0.3695 | 0.3612 | 0.3699 | 0.3655 | 0.3573 | 0.1029 | 0.1018 | 0.0924 | 0.0920 | 0.0934 | 0.0990 |
| | (0.0033) | (0.0033) | (0.0065) | (0.0053) | (0.0037) | (0.0049) | (0.4602) | (0.4665) | (0.5266) | (0.5294) | (0.5093) | (0.4865) |
| NFS liquidation costs | -0.0361 | -0.0368 | -0.0427 | -0.0316 | -0.0416 | -0.0409 | -0.0262 | -0.0248 | -0.0312 | -0.0318 | -0.0351 | -0.0358 |
| | (0.0408) | (0.0464) | (0.0178) | (0.0957) | (0.0175) | (0.0196) | (0.2150) | (0.2618) | (0.1458) | (0.1632) | (0.0970) | (0.0923) |
| Customer bargaining power | -0.0331 | -0.0332 | | | | | -0.0508 | -0.0505 | | | | |
| | (0.0661) | (0.0662) | | | | | (0.0182) | (0.0193) | | | | |
| Supplier bargaining power | | | -0.0599 | -0.0420 | | | | | -0.1368 | -0.1379 | | |
| | | | (0.2940) | (0.4666) | | | | | (0.0453) | (0.0483) | | |
| Employee bargaining power | | | | | 0.0187 | 0.0168 | | | | | 0.0051 | 0.0068 |
| | | | | | (0.2535) | (0.3130) | | | | | (0.7979) | (0.7355) |
| NFS liquidation costs * Customer bargaining power | | 0.0020 | | | | | | -0.0043 | | | | |
| | | (0.8991) | | | | | | (0.8116) | | | | |
| NFS liquidation costs * Supplier bargaining power | | | | -0.0979 | | | | | | 0.0056 | | |
| | | | | (0.0830) | | | | | | (0.9341) | | |
| NFS liquidation costs * Employee bargaining power | | | | | | 0.0097 | | | | | | -0.0090 |
| | | | | | | (0.5408) | | | | | | (0.6355) |
| Collateral value | 0.0855 | 0.0829 | 0.1114 | 0.1350 | 0.0867 | 0.0920 | 0.5552 | 0.5576 | 0.5765 | 0.5748 | 0.5989 | 0.5991 |
| | (0.6520) | (0.6647) | (0.5775) | (0.4984) | (0.6516) | (0.6303) | (0.0017) | (0.0017) | (0.0017) | (0.0019) | (0.0008) | (0.0008) |
| Profitability | -0.0044 | -0.0045 | -0.0048 | -0.0046 | -0.0045 | -0.0046 | -0.0078 | -0.0078 | -0.0066 | -0.0066 | -0.0078 | -0.0077 |
| | (0.1090) | (0.1090) | (0.0926) | (0.1016) | (0.1073) | (0.1010) | (0.0290) | (0.0300) | (0.0686) | (0.0696) | (0.0314) | (0.0330) |
| Growth opportunities | -0.0176 | -0.0177 | -0.0177 | -0.0193 | -0.0212 | -0.0206 | -0.0319 | -0.0315 | -0.0274 | -0.0272 | -0.0351 | -0.0358 |
| | (0.4755) | (0.4731) | (0.4824) | (0.4406) | (0.3936) | (0.4072) | (0.2758) | (0.2840) | (0.3552) | (0.3592) | (0.2379) | (0.2307) |
| Risk | -0.5103 | -0.5089 | -0.5608 | -0.5504 | -0.5314 | -0.5186 | -0.7222 | -0.7224 | -0.7632 | -0.7642 | -0.7741 | -0.7887 |
| | (0.0248) | (0.0257) | (0.0185) | (0.0201) | (0.0204) | (0.0244) | (0.0067) | (0.0068) | (0.0054) | (0.0055) | (0.0041) | (0.0038) |
| Firm size | 0.0711 | 0.0710 | 0.0714 | 0.0675 | 0.0711 | 0.0718 | 0.0488 | 0.0489 | 0.0472 | 0.0474 | 0.0465 | 0.0460 |
| | (<.0001) | (<.0001) | (<.0001) | (<.0001) | (<.0001) | (<.0001) | (0.0023) | (0.0023) | (0.0036) | (0.0041) | (0.0045) | (0.0051) |
| Leverage | | | | | | | -0.2790 | -0.2946 | 0.3791 | 0.3890 | 0.0359 | 0.0287 |
| | | | | | | | (0.7964) | (0.7861) | (0.7289) | (0.7244) | (0.9740) | (0.9792) |
| Debt mix | -0.5374 | -0.5271 | -0.5396 | -0.5229 | -0.3680 | -0.4053 | | | | | | |
| | (0.4775) | (0.4896) | (0.4956) | (0.5068) | (0.6259) | (0.5931) | | | | | | |
| Adjusted $R^2$ | 16.16% | 19.48% | 15.46% | 16.36% | 15.25% | 14.98% | 20.24% | 19.85% | 18.86% | 18.23% | 17.92% | 17.59% |