ABSTRACT
According to the finance literature, nonfinancial stakeholders (NFS), such as customers, suppliers, and employees, take into account their expected liquidation costs when dealing with a firm. In this framework, firms can influence their probability of liquidation by choosing an appropriate capital structure. Also, the literature suggests NFS bargaining power may affect firm financing decisions. In the current article we investigate these ideas for initial financing decisions by business start-ups, where ex ante failure risk is high and NFS must decide whether to make relationship-specific investments. We find that start-ups imposing larger costs upon their NFS following liquidation significantly reduce leverage. This effect is strengthened when suppliers have greater bargaining power. We also document a marginally negative effect of NFS liquidation costs on the proportion of bank loans. Finally, business start-ups rely less on bank loans when customers and suppliers are in a powerful bargaining position.

I. INTRODUCTION
We empirically investigate how the relationships between a firm and its nonfinancial stakeholders (NFS) influence capital structure. Although the finance literature so far has paid much attention to how relationships with and among financial stakeholders affect financing decisions, a number of 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 determines the future liquidation decision, which in turn affects the terms of trade between a firm and its NFS, and hence firm profitability. More specifically, NFS take into account that they may lose their relationship-specific investments once the firm is liquidated following a default on its debt and thus ask compensation for that ex ante through contract terms. Alternatively, NFS could even limit the amount of ex ante relationship-specific investments in the firm. Firms in turn can influence this process to maximize their overall value by reducing the probability of liquidation up front, for example, by limiting their debt ratio. This idea is refined in subsequent models by Maksimovic and Titman (1991) and Arping and Lóránth (2006), among others.

Besides the NFS liquidation cost channel, the bargaining power of NFS vis-à-vis the firm may also affect firm financing decisions. Bronars and Deere (1991), Dasgupta and Sengupta (1993), and Perotti and Spier (1993) argue that once contracts with labor suppliers have been established, firms can lower the amount of surplus that powerful unions can extract by increasing their debt ratio. These authors therefore predict a positive relation between NFS bargaining power and leverage. In contrast, Sarig (1998) shows that when firms worry about input suppliers threatening to curtail their specialized factors of production, they will limit leverage both before and after contracts are negotiated with NFS to prevent potential NFS hold-up behavior. The reason is that a lower debt ratio reduces the likelihood that a disruption of supplies will lead to the firm’s liquidation. Following Aghion and Tirole (1994) and Allen and Phillips (2000), among others, one could also argue that neutralizing the larger ex ante bargaining power of some NFS through restricting the debt ratio will induce customers, suppliers, and employees to make relationship-specific investments in the first place. Indeed, through its impact on incentives to break off or change the terms of an agreement ex post, the bargaining power of some
NFS could influence the ex ante investment in relationship-specific assets and knowledge by other NFS.

The empirical literature investigating the effects of NFS liquidation costs and bargaining power on capital structure is scarce, largely because it is difficult to operationalize these theoretical constructs using firm-level (accounting) data. Titman and Wessels (1988), Opler and Titman (1994), and Welch (2004), for example, use the ratios of selling expenses to sales and R&D to sales to proxy for NFS liquidation costs. A few studies have related these concepts to the structure of input and output markets. For example, Kale and Shahrur (2007) use concentration in customer and supplier industries to proxy for NFS bargaining power. It is not surprising that this research yields mixed results regarding the effects of NFS relationship costs on capital structure. Indeed, Titman and Wessels (1988), Opler and Titman (1994) and Kale and Shahrur (2007) document a significant negative relation between NFS liquidation costs and leverage, whereas Welch (2004) finds no effect. Nonetheless, survey evidence by Brounen, de Jong, and Koedijk (2006) reveals that more than 30% of CFOs in France and the United Kingdom consider customers and suppliers concern about bankruptcy an important determinant of their debt choice. This aspect ranks third, after financial flexibility and the volatility of earnings and cash flows, and thus precedes taxes, agency costs and information asymmetries. Regarding NFS bargaining power, Kale and Shahrur (2007) document that firms have significantly higher debt ratios when customers and suppliers are in a strong bargaining position, while Sarig (1998) shows that debt ratios are significantly lower when input suppliers have larger bargaining power.

In this article we use unique survey data to examine the role NFS relationship costs play in the initial financing decisions made by first-time business start-ups. These start-ups are neither the result of incorporating a previously self-employed activity nor a new subsidiary by an existing enterprise. Therefore, these firms need to build relationships with their customers, suppliers and employees from scratch. From the point of view of NFS, setting up such relationships is a risky venture, especially when they have to make large firm-specific investments. Indeed, start-ups typically face high ex ante failure risk, and the information asymmetries between firm insiders and outsiders are large, given the firm’s lack of operating history. It is well known that one out of two start-ups ceases operations within the first five years (e.g., Berger and Udell 1998; Huygebaert and Van de Gucht 2004). Hence, in the presence of large information asymmetries, NFS may find it difficult to determine a start-up firm’s intrinsic quality and thus survival chances. Next, entrepreneurs generally are owner-managers and therefore have discretionary power regarding the firm’s strategy and operations; this also provides flexibility for entrepreneurs to make decisions that could harm NFS once the firm is heading for financial distress. Nonetheless, NFS may be able to benefit considerably from the relationship-specific investments they made when start-up firms survive and grow. From the point of view of start-ups, relationships with customers, suppliers, and employees are crucial to ensure their profitability and survival. Start-up firms could encourage NFS to make these relationship-specific investments by limiting the likelihood of liquidation up front. Moreover, when liquidation risk is limited, the terms of trade between the firm and its NFS are likely to be more favorable to start-ups. Titman (1984) points out that choosing a capital structure with limited debt is useful for this purpose.

Entrepreneurs cannot ignore that NFS with bargaining power may try to extract rents from the start-up firm when negotiating their contracting relationship. As employees in start-up firms usually are not unionized and thus have only limited bargaining power against their employer, we examine only the effects of customer and supplier bargaining power in this study. Consistent with Sarig (1998), we hypothesize that entrepreneurs may limit their firm’s debt ratio to reduce the negative effects of NFS bargaining power on firm profitability and survival. This conjecture contrasts with the arguments made for mature, listed firms, which have contracts with NFS already in place and may not be greatly concerned about liquidation. Entrepreneurs, however, are likely to be much more concerned about liquidation because they usually invest substantial financial and human capital in their venture and enjoy sizable private benefits of control (e.g., Hamilton 2000). Finally, we hypothesize that customer and supplier bargaining power may influence the pricing of NFS liquidation costs to the start-up firm and hence its financing decisions. Therefore, as an extension to the research by Titman (1984) and others, we examine whether the relation between NFS liquidation costs resulting from relationship-specific investments and capital structure is stronger when customers and suppliers have greater bargaining power.

Our study extends the limited empirical research on the effects of NFS relationship costs on capital structure in four ways. First, we examine the effects of NFS relationship costs on the initial financing decisions of business start-ups before NFS have made relationship-specific investments. Because start-up firms lack an operating history, the research setting is relatively clean: the initial capital structure reflects the firm’s true financing choices at start-up and is not yet influenced by operating performance. Second, we combine accounting data with unique and detailed survey data to
construct proxy variables for the theoretical constructs of interest. The value of information that is not included in the financial statements is documented by Kale and Shahrur (2007), but only in the context of mature, listed firms. Third, we examine whether NFS liquidation costs have a greater effect on capital structure when customers and suppliers are in a strong bargaining position. Finally, we investigate the impact of NFS relationship costs on the debt ratio as well as the debt composition. We thus explicitly recognize that entrepreneurs may use more than one aspect of capital structure to deal with NFS relationship costs. For newly established ventures in traditional industries, the external financing sources typically consist of bank loans and trade credit (e.g., Berger and Udell 1998; Huygebaert and Van de Gucht 2007). Because banks enforce liquidation rights more strictly upon default than suppliers, entrepreneurs may be able to reduce their liquidation risk by limiting the portion of debt from bank loans, ceteris paribus.

Our results show that NFS relationship costs significantly affect capital structure, both statistically and economically. In particular, start-ups imposing larger costs upon their NFS following liquidation significantly reduce their debt ratio. This effect is strengthened when suppliers have greater bargaining power. We also find a marginally negative effect of NFS liquidation costs on the proportion of bank loans. Furthermore, our results show that when customer and supplier bargaining power are stronger, start-ups reduce their reliance on bank loans. Overall, the last findings are consistent with Sarig’s (1998) model and suggest that entrepreneurs, being concerned about their firm’s liquidation and potential hold-up behavior by customers and suppliers, reduce their vulnerability to NFS bargaining power ex ante by adjusting the debt mix.

II. DEVELOPMENT OF HYPOTHESES

Ever since Modigliani and Miller (1958) developed their irrelevance propositions, arguing that it does not matter how you slice a cake as long as its size remains constant, researchers have analyzed a wide range of market imperfections to argue that capital structure does have a bearing on firm value. Whereas originally this research concentrated on taxes, financial stakeholder information, and agency costs, more recent studies borrow insights from the industrial organization literature to further new capital structure determinants. Most of these studies examine how the use of debt influences strategic interactions between an enterprise and its rival firms. A small but growing number of articles investigate how the relationship costs between a firm and its customers, suppliers, and employees affect financing decisions. These NFS typically have incomplete information about the firm but, unlike shareholders and creditors, hold no direct financial stake. Yet, NFS can influence firm value through the terms of trade they negotiate with the firm. Also, when NFS break off or change the terms of an agreement or relationship ex post, this will affect firm value. Firms, in turn, can reduce the negative effects of NFS relationship costs on their value by choosing an appropriate capital structure. In this article we examine how NFS liquidation costs resulting from relationship-specific investments and NFS bargaining power affect leverage and debt composition.

**NFS Liquidation Costs**

Even when the contracts between a firm and its NFS are short term, NFS may hold implicit long-term claims when recontracting with this same firm is less costly than switching to another firm. As these implicit claims cannot be unbundled and sold apart from NFS explicit contracts, the risk associated with holding these claims is difficult to diversify. Moreover, NFS may incur large losses if a firm is liquidated, as their implicit claims become worthless. The size of the losses that NFS suffer upon the firm’s liquidation, hereafter called NFS liquidation costs, usually rise with the amount of relationship-specific investments made by NFS. Such investments include the development of product-related skills by customers, the investment in customer relations and specific supply chains by suppliers, and the acquisition of job-specific knowledge by employees. NFS cannot recover these investments (“sunk” investments) once the firm is liquidated.

Therefore, before making these relationship-specific investments, NFS take into account the firm’s likelihood of liquidation. Also, like financial stakeholders, NFS consider the firm’s risk profile when valuing their direct and implicit claims on the firm after contracts have been established. In other words, the value of NFS contracts depends at least in part on 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 financially distressed airlines reduce their ticket prices to compensate customers ex ante for the potential loss of frequent flyer advantages (relationship-specific asset). From the firm’s point of view, minimizing the proportion of NFS liquidation costs that are charged to the firm through higher input and lower output prices thus maximizes firm value. Theoretically, this can be achieved by lowering the probability of liquidation, reducing the size of NFS liquidation costs, and restraining the transfer of these costs to the firm. The
theoretical literature has mainly examined how capital structure can be used to lower the probability of liquidation (e.g., Titman 1984; Maksimovic and Titman 1991). A possible explanation is that managers can more easily adjust their financial strategy than their product market strategy. We also follow this approach and test whether firms adapt their capital structure to the size of NFS liquidation costs to minimize the likelihood of liquidation up front. In addition, we examine whether customer and supplier bargaining power affect the relation between NFS liquidation costs and capital structure, as NFS bargaining power will influence the extent to which NFS liquidation costs can be charged to the firm. Indeed, more powerful NFS may find it easier than less powerful NFS to transfer their liquidation costs to the firm.

In this article we study two important capital structure variables: leverage, which is the proportion of total financing that consists of debt, and debt mix, which is the proportion of bank loans in total debt. Prior empirical work on NFS liquidation costs (Titman and Wessels 1988; Opler and Titman 1994; Kale and Shahrur 2007) concentrates on the leverage decision. This is an obvious choice, as the debt ratio determines when a firm’s control rights are transferred from shareholders to creditors, who may liquidate the firm following default. An increase in firm leverage thus increases the probability of liquidation, ceteris paribus. But the liquidation decision for companies that default on their debt is also influenced by the composition of that debt (e.g., Gilson, John, and Lang 1990; Franks and Sussman 2005). For business start-ups, debt largely consists of bank loans and trade credit (Berger and Udell 1998; Huygebaert and Van de Gucht 2007). The literature provides several arguments why a larger proportion of bank loans relative to trade credit increases the probability of liquidation. First, banks include restrictive covenants in their debt contracts to reduce adverse selection and moral hazard problems after the loan is made. However, this practice is also likely to increase the probability that funds are cut off once firms default on their bank loans. In fact, Carey, Post, and Sharpe (1998) find evidence consistent with the idea that banks wish to establish a reputation of being fierce liquidators. Second, Berger and Udell (1998) report that more than 90% of bank loans to small business borrowers are collateralized. Manove, Padilla, and Pagano (2001) show that such practices induce banks to liquidate distressed companies prematurely following default, thereby avoiding the effort and the risk of restructuring a distressed firm. Third, Wilner (2000) and Huygebaert, Van de Gucht, and Van Hulle (2007) argue that if borrowers generate a large proportion of lender profits, creditors will be more lenient in periods of financial distress. As banks hold only a limited implicit equity stake in their borrowers, they will liquidate sooner than nonbank lenders, such as suppliers. Consistent with these ideas, Franks and Sussman (2005) find that banks enforce liquidation rights more strictly than suppliers following default by SMEs. Based on the preceding discussion, we suggest the following hypothesis:

Hypothesis 1: Firms with larger NFS liquidation costs will use less debt and less bank loans as a proportion of total debt, ceteris paribus.

**NFS Bargaining Power**

NFS bargaining power is defined as the ability of NFS to appropriate a portion of the firm’s surplus (rents). Factors that increase the bargaining power of NFS are, for example, the size of customers and suppliers, and employee union participation. As employee unionization rates are low for business start-ups, we investigate only the influence of customer and supplier bargaining power in this article.

The theoretical literature shows that capital structure can be used to reduce the amount of surplus NFS can extract from the firm. Yet, researchers generally differ in their assumption as to who is more averse to liquidation: NFS or the firm itself. As a result, they also have different conjectures about the effects of NFS bargaining power on capital structure. Bronars and Deere (1991), Dasgupta and Sengupta (1993), and Perotti and Spier (1993) assume the firm (its shareholders) is not as concerned about liquidation as its NFS. Furthermore, these authors concentrate on situations where contracts with NFS are already in place, and financing decisions thus can be used to rebalance the relative bargaining power of the firm against its NFS. Bronars and Deere and Dasgupta and Sengupta argue that firms issuing debt rather than equity are obliged to pay out a portion of their future earnings to creditors. Hence, these obligations limit the surplus that powerful NFS can extract without driving the firm into default. The authors thus predict that firms will increase their leverage when dealing with strong NFS. Perotti and Spier find a similar effect on leverage, albeit for a different reason. They show that a highly leveraged firm can force more concessions from its NFS by threatening not to undertake investments that are crucial for its survival. In contrast to these early studies, Sarig (1998) studies the effects of NFS bargaining power on financing decisions before relationships with NFS are well established (ex ante). Also, Sarig assumes that the firm (its shareholders) is more averse to liquidation than are its NFS. Overall, he points out that firms can limit their vulnerability to liquidation when powerful suppliers threaten to curtail the supply of specialized factors of production by restricting their
debt ratio. This by itself may already prevent potential NFS hold-up behavior. What’s more, when firms can neutralize the large ex ante bargaining power of some of their NFS through restricting their debt ratio and proportion of bank loans up front, then other customers, suppliers, and employees may have incentives to invest in relationship-specific assets and knowledge in the first place. This idea builds on the research by Aghion and Tirole (1994) and Allen and Phillips (2000), among others. The authors suggest that through its impact on incentives to break off or change the terms of an agreement ex post, the bargaining power of some NFS could adversely affect the ex ante investment in relationship-specific assets and knowledge. Yet, Aghion and Tirole (1994) and Allen and Phillips (2000) examine the implications of such hold-up behavior for corporate equity ownership, which can be used to align the incentives of the firms that need to invest in product market relationships. For the newly established firms in our sample, equity ownership stakes by customers and suppliers are trivial in the start-up year. Nonetheless, the arguments in these papers can have more general implications for capital structure.

Overall, we expect to find support for Sarig’s (1998) model in a sample of business start-ups that have to decide on their initial capital structure, as (1) firms still need to negotiate contracts with NFS and (2) entrepreneurs are likely to highly value their venture’s survival. Indeed, ownership in business start-ups as a rule is highly concentrated in the hands of one or a few entrepreneurs who generally hold a largely undiversified portfolio. In our sample, 64.62% of entrepreneurs own more than 50% of their firm’s shares. Most of the other equity is provided by family and friends, whereas only four firms received venture capital at the moment of start-up. In addition, and consistent with Hamilton (2000), the entrepreneurs in our sample highly value their private benefits of control; 56.28% indicate that their main motivation for becoming an entrepreneur is the challenge of managing their own business. Also, 45.58% of entrepreneurs indicate that being their own boss is an important reason for setting up their own venture. Purely financial reasons—that is, earning more than under wage employment—are important for only 19.53% of the entrepreneurs in our sample.

In sum, although distinguishing between the predictions of Bronars and Deere (1991), Dasgupta and Sengupta (1993), and Perotti and Spier (1993) on the one hand, and Sarig (1998) on the other is a purely empirical issue, we expect to find support for Sarig’s model when examining the initial financing decisions of business start-ups. Therefore, when the bargaining power of customers and suppliers is extensive, we hypothesize that entrepreneurs will reduce their debt ratio to curb the likelihood of liquidation. Likewise, neutralizing the larger ex ante bargaining power of some NFS through restricting the debt ratio will induce customers, suppliers, and employees to make relationship-specific investments in the first place. From our discussion on the relation between the debt composition and the probability of liquidation, we also conjecture that firms can moderate the influence of NFS bargaining power on the probability of incentive problems with NFS and firm liquidation by limiting the proportion of bank loans in total debt. Therefore, we suggest the following hypothesis:

Hypothesis 2: Firms that face customers and suppliers with stronger bargaining power will use less debt and less bank loans as a proportion of total debt, ceteris paribus.

Interaction between Liquidation Costs and Bargaining Power

As an extension to Hypothesis 1, and thus the theoretical models of Titman (1984), Maksimovic and Titman (1991), among others, we argue that the effects of NFS liquidation costs resulting from relationship-specific investments on capital structure could be stronger when NFS bargaining power is greater. Therefore, unlike agency costs between creditors and shareholders, which affect firm value euro per euro through the price of debt and thus should be fully incorporated into financing decisions (e.g., Jensen and Meckling 1976), we conjecture that firms will take into account NFS liquidation costs especially when the liquidation costs can be easily charged to the firm through input and product prices. As the extent to which NFS liquidation costs can be transferred to the firm is likely to depend on—in addition to institutional characteristics—the relative bargaining power of NFS against the firm, we hypothesize that firms may adjust their capital structure to deal with NFS liquidation costs, especially when customers and suppliers are in a strong bargaining position. Therefore, in addition to the simple term NFS liquidation costs, as captured by Hypothesis 1, we expect its interaction term with NFS bargaining power to influence capital structure and propose the following hypothesis:

Hypothesis 3: The effect of NFS liquidation costs on capital structure is strengthened when customers and suppliers have greater bargaining power. Therefore, the interaction term between NFS liquidation costs and NFS bargaining power will be negatively related to leverage and the proportion of bank loans in total debt, ceteris paribus.

Equation (1) summarizes our research design:
where

\[ CS_{ij} = a_{i1} + a_{i2} \times LC_{ij} + a_{i3} \times BP_{ij} + a_{i4} \times (LC_{ij} \times BP_{ij}) + \sum_{l=1}^{L} b_{ijl} X_{ij} \]  

(1)

III. DATA

The empirical capital structure literature focuses on listed firms, largely because data on these firms are readily available. Yet, to examine the effects of NFS relationship costs on financing decisions, a sample of newly established entrepreneurial ventures may be more appropriate because of these firms’ high failure risk, lack of operating history, and large information asymmetries. Also, as entrepreneurs are more averse to liquidation and firms have not yet entered into contracts with their NFS, examining the effects of NFS relationship costs in such a sample may yield additional insights. Whereas access to financial data on privately held firms is not straightforward 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 accounts with the National Bank as of start up. In 2006, nearly 330,000 companies submitted their financial statements, thereby covering about 80% of gross domestic product (only self-employed, one-person businesses are not covered). This information is commercialized by Bureau Van Dijk Electronic Publishing via the Belfirst database.

In the first stage of the sample-selection process we used the PASO START database to select our sample of business start-ups. This database contains survey information on 638 Belgian corporations established between October 2001 and September 2002 and employing between 1 and 49 persons (www.paso.be). These firms represent a 23.81% response rate from Belgian start-ups that meet the preceding criteria. The survey consists of 91 questions, which poll entrepreneurs on their firm’s financial and ownership structure, operations, organization, and strategic choices at start-up. Although some questions were quantitative (e.g., the percentage of sales that are customer specific), others required answers on a five-point Likert scale. Entrepreneurs were questioned shortly after start-up so that there is no survivorship bias in this database. We combined this unique survey information with the firms’ annual accounts collected from Belfirst.

In the second stage we excluded all firms that were not entrepreneurial and first-time business start-ups. This selection criterion thus removed firms that were incorporations of a previously self-employed one-person business or firms that changed their type of corporation. Also, newly established subsidiaries by existing firms, split-ups, spin-offs, and other start-ups that are affiliated with an existing enterprise were deleted. These screening criteria reduced the sample from 638 to 223 business start-ups that had not yet built up a reputation in input and output markets at their moment of start-up. After deleting firms with insufficient data to perform the multivariate analyses, we obtained a final sample of 209 true business start-ups. These firms are narrowly focused and report only one industry code, the European Nomenclature des Activités Economiques dans la Communauté Européenne (NACE) code. Like the population, a significant portion of the firms in our sample is active in trade and services. This contrasts with most previous studies on newly established enterprises, which examine either manufacturing start-ups (e.g., Huyghebaert and Van de Gucht 2007) or high-tech ventures (e.g., Manigart and Struyf 1997).

<table>
<thead>
<tr>
<th>TABLE 1. Characteristics of the start-up firms.</th>
<th>Mean</th>
<th>median</th>
<th>5th pctl</th>
<th>95th pctl</th>
<th>std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRM SIZE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of employees</td>
<td>5.9882</td>
<td>3</td>
<td>1</td>
<td>21</td>
<td>11.6471</td>
</tr>
<tr>
<td>Total assets (€)</td>
<td>488827</td>
<td>179500</td>
<td>32000</td>
<td>1592000</td>
<td>1177220</td>
</tr>
<tr>
<td>Total financing sources (€)</td>
<td>493293</td>
<td>184000</td>
<td>39000</td>
<td>1699000</td>
<td>1204680</td>
</tr>
<tr>
<td><strong>ASSET STRUCTURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed tangible assets/total assets</td>
<td>0.3532</td>
<td>0.3027</td>
<td>0.0200</td>
<td>0.8526</td>
<td>0.2643</td>
</tr>
<tr>
<td>Inventories/total assets</td>
<td>0.1841</td>
<td>0.1244</td>
<td>0.0068</td>
<td>0.5831</td>
<td>0.1846</td>
</tr>
<tr>
<td>Cash and marketable securities/total assets</td>
<td>0.1448</td>
<td>0.0966</td>
<td>0.0032</td>
<td>0.4560</td>
<td>0.1528</td>
</tr>
<tr>
<td><strong>FINANCIAL STRUCTURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage: outside debt/total financing sources</td>
<td>0.6084</td>
<td>0.6833</td>
<td>0.0914</td>
<td>0.9329</td>
<td>0.2690</td>
</tr>
<tr>
<td>Debt mix: bank debt/total debt</td>
<td>0.3612</td>
<td>0.3357</td>
<td>0.0</td>
<td>0.8801</td>
<td>0.3052</td>
</tr>
</tbody>
</table>
Table 4. Factor analysis for NFS liquidation costs and NFS bargaining power.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade credit/total debt</td>
<td>0.2390</td>
<td>0.1611</td>
<td>0.0049</td>
<td>0.6988</td>
<td>0.2459</td>
</tr>
<tr>
<td>Entrepreneurial loans/total debt</td>
<td>0.1712</td>
<td>0.0526</td>
<td>0</td>
<td>0.6977</td>
<td>0.2426</td>
</tr>
<tr>
<td>LT debt (&gt;1 year)/total debt</td>
<td>0.3093</td>
<td>0.2635</td>
<td>0</td>
<td>0.8554</td>
<td>0.3003</td>
</tr>
<tr>
<td>LT bank debt (&gt;1 year)/bank debt</td>
<td>0.8217</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.3271</td>
</tr>
</tbody>
</table>

Note: This table provides descriptive statistics for the sample of 209 business start-ups that is constructed from the PASO START database. All sample firms are established in Belgium between October 2001 and October 2002, and have between 1 and 49 employees in the start-up year. They are neither incorporations of a previously self-employed one-person business nor firms that changed their type of corporation or firms that are affiliated (spin-offs, subsidiaries,…) with an existing enterprise. The descriptive characteristics are based on the financial statements of the first accounting year. Total financing sources is the sum of outside (i.e. nonentrepreneurial) debt and entrepreneurial loans and equity. The other variables are self contained.

Table 1 reports descriptive statistics on firm size, asset structure, and financial structure in the start-up year. The median firm employs three people in the start-up year and its total assets equal €179,500. As median total assets is less than median financing sources (€184,000), more than half of sample firms incur accounting losses during the start-up year. Summary statistics on asset structure reveal that fixed tangible assets on average represent 35.32% of total assets, whereas inventories and cash account for 18.41% and 14.48%, respectively. The start-ups in our sample are highly leveraged, as outside (i.e., nonentrepreneurial) debt on average equals 60.84% of total financing sources in the start-up year; the median debt ratio equals 68.33%. 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, the average firm raises 36.12% of funds from banks and 23.90% from suppliers (trade credit). We find 72.25% of firms rely on bank loans whereas 97.26% use trade financing in the start-up year (not reported). Other creditors include the workforce and tax authorities. Only 30.93% of total debt outstanding matures after one year, which reflects the importance of current liabilities (including trade credit) for business start-ups. For bank debt, this percentage is 82.17%, however.

We extended the operating and financial information on the business start-ups in our sample with annual accounts—again using Belfirst—of all incumbent firms in the corresponding five-digit NACE industries from 1996 to 2001 (i.e., during the six years preceding the sample year). This resulted in data for 35,528 additional firms. As explained in the next section, data on recently established start-up firms are used to calculate historical, exogenous industry-level variables to measure some of the control variables.

IV. VARIABLE MEASUREMENT AND METHODOLOGY

To examine the influence of NFS relationship costs on capital structure, we need to construct a set of proxy variables that are closely related to the concepts of interest. One methodological challenge is resolving the endogeneity problem between capital structure and product market strategy. Arping and Löránt (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 were reduced. Therefore, for mature firms, the size of NFS liquidation costs and, more generally, the firm’s operating strategy could be affected by its financial history. In their robustness checks, Kale and Shahrur (2007) take this potential endogeneity problem into account by lagging explanatory variables and estimating a simultaneous equations model for leverage and customer and supplier R&D intensity, respectively. Our study takes a different approach by examining business start-ups that do not have an operating or financial history and that need to decide on their capital structure before entering the product market.

As all firms in our sample are private enterprises, we use book value measures to define the capital structure variables, that is, the dependent variables. Starting from first-year balance sheets, we recalculate the initial financial structure as closely as possible to the moment of start-up by disregarding the changes in equity due to retained earnings (mostly losses). Also, entrepreneurial loans are considered equity rather than debt financing and thus are not included in our definition of the debt ratio (see footnote 7). Leverage is then calculated as the ratio of outside debt to total initial financing sources. Debt mix is the ratio of bank loans to total debt outstanding.

The variables NFS liquidation costs and NFS bargaining power are difficult to measure. Furthermore, proxy variables used in prior empirical research (e.g., R&D expenses) are not always available for European firms because of some minor differences in financial reporting. Nonetheless, Kale and Shahrur (2007) point out that information that is generally not included in the annual accounts may also adequately capture NFS relationship costs. In this study, we therefore combine financial statement information with a set of new proxy variables that are calculated from the PASO START survey database. As this survey contains unique and detailed information on the start-up’s contracts with NFS and input and output market strategies, it is well suited to test our hypotheses. Table 3 describes the survey questions that are relevant for our study on NFS liquidation costs and bargaining power.

TABLE 4. Factor analysis for NFS liquidation costs and NFS bargaining power.
Each of the questions capturing NFS liquidation costs is related to the concept of NFS relationship-specific investments and has implications for all types of NFS (customers, suppliers, and employees): if products and services are unique and production processes and technologies are new or advanced, all NFS have to make firm-specific investments. As the bargaining power of customers and suppliers is not necessarily closely related, we calculate separate measures for each. This approach is consistent with theoretical models on NFS liquidation costs, which do not distinguish between customers, suppliers, and employees either (e.g., Titman 1984). In contrast, studies linking NFS bargaining power to capital structure do focus on one specific NFS type, for example, employees (Bronars and Deere 1991) and suppliers (Sarig 1998). To effectively summarize the relevant information in the survey questions, we perform factor analyses on the questions measuring NFS liquidation costs and customer bargaining power. This technique is based on the idea that the correlations within a set of selected variables are due to some common underlying (unobservable) force(s). Hence, factor analysis extracts the force(s) that best explain the correlations among the variables (see also Titman and Wessels 1988). The results of the factor analyses for NFS liquidation costs and customer bargaining power are reported in Table 4. We retain the factor with the highest eigenvalue from each analysis and investigate whether the sign of the factor loadings, which measure the importance of a particular variable, is consistent with the concept of interest.

Table 3 shows that firms scoring high on the NFS liquidation cost variable have unique products and services that are difficult to copy. These firms have no problem differentiating themselves from their competitors and strongly emphasize new or advanced processes and technologies. Overall, these results support our conjecture that NFS have to make substantial relationship-specific investments and thus face high liquidation costs when they are proxy variables for NFS liquidation costs. Next, firms with a high value for customer bargaining power involve customers in their strategic and product market decisions. These firms regularly consult their customers and incorporate information on customer needs, tastes, and preferences in their operating decisions. Furthermore, these firms pay close attention to changes in customer preferences and are responsive to changes in customer needs.

For supplier bargaining power, we use a dummy variable that equals 1 when the firm buys its main inputs from only one supplier (“single sourcing”), and 0 otherwise. This bargaining power variable is related to the measure used by Kale and Shahrur (2007), who calculate the concentration ratio in supplier industries. As expected, our measures of NFS liquidation costs and bargaining power of customers and suppliers are not highly correlated (below 0.3).
Finally, based on the existing literature we select control variables for the leverage and debt mix equations. Prior studies find that collateral value of assets, profitability, growth opportunities, risk, and firm size are all significant determinants of capital structure in listed firms (see footnote 1). These variables are also likely important for business start-ups, as agency problems with creditors cannot be ignored, given the high failure risk and large information asymmetries in start-ups (see also Huyghebaert and Van de Gucht 2007). Because start-ups have no history, historical firm-level data are not available to calculate these control variables. Using data on asset structure from the start-up year could result in serious endogeneity problems, however. Therefore, except for firm size, we measure the control variables at the corresponding five-digit NACE industry level. We obtained information for business start-ups that started one year before our sample, from October 2000 to October 2001. Collateral value is measured as fixed tangible assets to total assets. Profitability is calculated as the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to total assets. Growth opportunities are proxied by the one-year lagged sales growth rate. Risk is captured by the percentage of start-up firms with negative cash flows in the corresponding industry; we calculate this variable over 1996–2001 to improve its reliability. Finally, firm size is measured by the log of total financing sources in the start-up year. Table 5 summarizes the control variables and presents descriptive statistics and their expected relation to the capital structure variables.

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Description</th>
<th>Mean</th>
<th>Median</th>
<th>Std. dev</th>
<th>Lever age</th>
<th>Debt mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collateral value</td>
<td>Industry mean of fixed tangible assets for all historical start-up firms</td>
<td>0.3784</td>
<td>0.3720</td>
<td>0.1331</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>(between 10/2000 and 10/2001) in the corresponding industry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>Industry mean of EBITDA to total assets for all historical start-up firms</td>
<td>0.0646</td>
<td>0.0585</td>
<td>0.0779</td>
<td>–/−</td>
<td>–/−</td>
</tr>
<tr>
<td></td>
<td>(between 10/2000 and 10/2001) in the corresponding industry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth Opportunities</td>
<td>Industry mean of sales growth for all historical start-up firms</td>
<td>0.3167</td>
<td>0.1691</td>
<td>0.7405</td>
<td>–/−</td>
<td>–/−</td>
</tr>
<tr>
<td></td>
<td>(between 10/2000 and 10/2001) in the corresponding industry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>The percentage of start-up firms with a negative cash flow</td>
<td>0.2032</td>
<td>0.2043</td>
<td>0.0857</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>during the first start-up year for all start-up firms during 1996–2001 in</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>the corresponding industry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>Logarithm of total financing sources in the start-up year (firm-level variable)</td>
<td>5.2076</td>
<td>5.0173</td>
<td>1.2936</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Note: This table presents the control variables that are used in the multivariate regressions of leverage and debt mix. Except for firm size, these control variables are measured at the corresponding five-digit NACE industry level. Besides, we report summary statistics for these control variables and the expected sign of their relation with leverage and debt mix. The data to calculate these control variables were collected from the Belfirst database, which includes the annual accounts of all corporations in Belgium.

Recent studies (e.g., MacKay 2003; Huyghebaert and Van de Gucht 2007) incorporate the potential interdependencies among various capital structure components in their estimations using a simultaneous equations model. The conditions of such a model are demanding, however. MacKay and Huyghebaert and Van de Gucht conclude that even though various aspects of capital structure are jointly determined, using ordinary least squares (OLS) to estimate the effect of exogenous variables does not largely affect the results. Hence, we use a cross-sectional OLS regression model to examine the role of NFS relationship costs and test the robustness of our findings after accounting for the potential interactions between leverage and debt composition.

V. EMPIRICAL RESULTS

In this section, we look at how NFS liquidation costs and NFS bargaining power affect a start-up’s initial capital structure. Then, we test whether these variables also have a joint effect on financing decisions and discuss our findings for the control variables. Finally, we report the results from various additional analyses and robustness checks. Overall, given the size of our sample, we use a 10% cutoff to determine the statistical significance of the variables in our models. Multicollinearity is never a problem, as variance inflation factors are always below five.

NFS Liquidation Costs

In line with earlier findings by Titman and Wessels (1988), Opler and Titman (1994), and Kale and Shahrur (2007) for listed firms, Table 6, column 1 reveals that business start-ups have significantly lower leverage when NFS liquidation costs are large ($p$-value of .0180). This result is both statistically and economically significant. A firm with NFS liquidation costs one standard deviation higher than an otherwise identical firm has 3.97% less debt outstanding. This relation is robust after including industry-level dummy variables based on the Fama and French industry classification in column 2 ($p$-
value of .0087). Furthermore, this result remains robust as each survey question, one-by-one, is excluded from the factor analysis for NFS liquidation costs (not reported). Overall, these findings confirm Hypothesis 1 that newly established entrepreneurial ventures choose a capital structure that lowers their probability of default and thus liquidation when NFS face high liquidation costs, c.p.

TABLE 6. Determinants of leverage and debt mix for start-up firms: The base model.

<table>
<thead>
<tr>
<th></th>
<th>Leverage (proportion of total funds that is outside debt financing)</th>
<th>Debt mix (proportion of debt financing that is bank debt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.3917 (.0010)</td>
<td>0.0948 (.0044)</td>
</tr>
<tr>
<td></td>
<td>0.3134 (.0067)</td>
<td>0.0015 (.0887)</td>
</tr>
<tr>
<td></td>
<td>0.4061 (.0086)</td>
<td>-0.0565 (.0065)</td>
</tr>
<tr>
<td></td>
<td>0.1873 (.1810)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.4039 (.0012)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.3882 (.9173)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.9048 (.4522)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0174 (.9249)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1644 (.5412)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0155 (.7625)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0887 (.7625)</td>
<td></td>
</tr>
</tbody>
</table>

Firm variables:
- NSF LC: -0.0411 (.0108) -0.0461 (.0087) -0.0306 (.0837) -0.0378 (.0602) -0.0478 (.0426) -0.0353 (.0707) -0.0483 (.0924) -0.0305 (.1505) -0.0259 (.1324) -0.0195 (.2462) -0.0288 (.0812) -0.0288 (.0848)
- Cust. BP: -0.0317 (.0079) -0.0210 (.2598) -0.0560 (.0086) -0.0589 (.0078)
- Supp. BP: -0.0626 (.2701) -0.0575 (.3110) -0.1330 (.4881) -0.1296 (.5585)

Additional variables:
- Collateral value: 0.0304 (.3494) 0.1049 (.4848) -0.0015 (.9917) 0.1807 (.2244) 0.0207 (.8916) 0.1248 (.4273) 0.0605 (.0007) 0.5135 (.0017) 0.5520 (.0066) 0.4809 (.0013) 0.5839 (.0057) 0.5229 (.0180)
- Profitab.: -0.0043 (.1155) -0.0046 (.1583) -0.0003 (.1750) -0.0016 (.5652) -0.0040 (.1465) -0.0045 (.1734) -0.0079 (.0159) -0.0308 (.2456) -0.0037 (.0219) -0.0071 (.3511) -0.0054 (.0307) -0.0054 (.1680)
- Growth: -0.0180 (.4631) -0.0098 (.7162) -0.0167 (.4927) -0.0213 (.4064) -0.0169 (.4961) -0.0064 (.8140) -0.0347 (.2378) -0.1225 (.2824) -0.0313 (.2535) -0.0364 (.3676) -0.0257 (.4279)
- Risk: -0.4823 (.2070) -0.4250 (.4082) -0.0450 (.0314) -0.0362 (.8850) -0.5135 (.0227) -0.1961 (.4782) -0.7677 (.0034) -0.7677 (.0044) -0.7379 (.0010) -0.5850 (.0054) -0.5742 (.0249)
- Firm size: 0.0674 (.0001) 0.0643 (.0001) 0.0677 (.0001) 0.0693 (.0001) 0.0677 (.0001) 0.0672 (.0001) 0.0458 (.0435) 0.0458 (.0022) 0.0488 (.0005) 0.0570 (.0566) 0.0472 (.0015) 0.0541 (.0015)
- Industry: XXX XXX XXX XXX XXX XXX

Adjusted $R^2$: 14.45% 14.45% 15.27% 17.51% 14.56% 17.92% 18.73% 19.66% 20.62% 22.17% 19.04% 20.84%

Note: This table presents the OLS regression estimates of the determinants of (1) leverage and (2) the debt mix 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. p-values are reported between parentheses.

We find a similar albeit somewhat weaker negative effect of NFS liquidation costs on the debt mix in Table 6 (see column 1 of the debt mix equation), again supporting Hypothesis 1. A firm with NFS liquidation costs one standard deviation higher than an otherwise identical firm has 3.66% less bank loans as a proportion of total debt. Again, this relation continues to hold after excluding each survey variable from the NFS liquidation cost factor analysis (not reported). After the Fama and French (1993) industry dummy variables are included (in column 2), the p-value of NFS liquidation costs rises to .1505. However, in other models including these industry-level dummy variables, we find that NFS liquidation costs remains statistically significant at the 10% level, confirming a weak negative relation between this variable and the debt mix.

Overall, our findings indicate that for first-time business start-ups, limiting the debt ratio does not suffice to curb the negative effect of NFS liquidation costs on firm value. Indeed, and consistent with our hypotheses, these firms also adjust their debt composition when NFS are likely to face high liquidation costs. Moreover, when NFS liquidation costs are potentially large, business start-ups rely less on bank loans, consistent with the idea that banks in general are more aggressive liquidators than suppliers. In unreported analyses, we have examined whether business start-ups also adjust the maturity structure of their bank loans to deal with NFS relationship costs, but found no such relation.

**NFS Bargaining Power**

In this section we test Hypothesis 2, that is, that start-up firms reduce their leverage and proportion of bank loans in total debt to deal with powerful NFS. The discussion is presented first for customers and then suppliers.

The results for customers are presented in columns 3 and 4 of each capital structure equation in Table 6. Customer bargaining power is significantly and negatively related to the debt ratio ($p$-value of .0739). This finding, however, is not robust to the inclusion of industry dummy variables ($p$-value of .2598). Nonetheless, customer bargaining power significantly and negatively affects the proportion of bank loans in total debt ($p$-value of .0186). A one standard deviation increase in customer bargaining

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power lowers the proportion of bank loans by 4.95%. This relation remains robust after including industry dummy variables (p-value of .0078). Overall, these results support Hypothesis 2, but reveal that firms prefer to adjust their debt composition rather than overall debt ratio to reduce the likelihood of liquidation when customers are more powerful.

The results for supplier bargaining power are reported in columns 5 and 6 of each equation in Table 6. They reveal that firms do not adjust their leverage to deal with more powerful suppliers, but rather change the composition of their debt. Indeed, we find that supplier bargaining power is significantly and negatively related to the debt mix (p-value of .0481), which continues to hold after controlling for industry fixed effects (p-value of .0558). 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. Again, these results are consistent with Hypothesis 2, suggesting firms adjust their debt mix to reduce their probability of liquidation when suppliers can threaten firm survival.

Overall, our findings appear to contrast with those of Kale and Shahrur (2007). Indeed, these authors document a positive relation between customer and supplier concentration and leverage. Their results are thus consistent with the models of Bronars and Deere (1991), Dasgupta and Sengupta (1993), and Perotti and Spier (1993), whereas ours support Sarig (1998). However, Kale and Shahrur examine listed firms, where contracts with NFS are already in place. Established firms may have incentives to change their capital structure ex post to reduce the amount of surplus NFS can extract. In contrast, newly established ventures still need to persuade NFS to invest in a long-term relationship. Furthermore, for entrepreneurs in business start-ups, liquidation is likely to be a serious threat and firms are likely to worry about fierce bank liquidation policies. Hence, to restrain the negative effects of customer and supplier bargaining power on firm survival, firms appear to limit their proportion of debt that consists of bank loans. In sum, our findings do not contradict those of Kale and Shahrur, but rather illustrate the unique context of entrepreneurial start-ups.

**Interaction between Liquidation Costs and Bargaining Power**

As an additional test of the NFS liquidation cost theory, we hypothesize that the effects of NFS liquidation costs on capital structure are strengthened when NFS are in a strong enough bargaining position to influence firm profitability (Hypothesis 3). In Table 7, we include interaction terms between NFS liquidation costs and customer and supplier bargaining power, respectively, to investigate this idea. We find some limited support for Hypothesis 3, as the interaction term between NFS liquidation costs and supplier bargaining power is negative and significant in the leverage equation (p-value of .0594 and p-value of .0592 after including industry fixed effects). Yet, the interaction terms between NFS liquidation costs and customer bargaining power are never significantly related to capital structure. An explanation could be that the latter NFS can fully charge their expected liquidation costs when entering into a contracting relationship with the start-up, independent of their bargaining power.

### TABLE 7. Determinants of leverage and debt mix for start-up firms: Models with interaction terms.

<table>
<thead>
<tr>
<th>Element</th>
<th>Leverage</th>
<th>Debt mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.4072 (0.0006)</td>
<td>0.10343 (0.4577)</td>
</tr>
<tr>
<td>NFS LC</td>
<td>-0.0321 (0.0826)</td>
<td>-0.0245 (1.044)</td>
</tr>
<tr>
<td>Customer BP</td>
<td>-0.0320 (0.0723)</td>
<td>-0.0497 (0.198)</td>
</tr>
<tr>
<td>Supplier BP</td>
<td>-0.0321 (0.0006)</td>
<td>-0.0497 (0.198)</td>
</tr>
<tr>
<td>NFS LC * cust.</td>
<td>0.0044 (0.7739)</td>
<td>-0.0040 (0.8236)</td>
</tr>
<tr>
<td>NFS LC * supp. BP</td>
<td>-0.1061 (1.057)</td>
<td>-0.1060 (0.9215)</td>
</tr>
<tr>
<td>Collateral value</td>
<td>-0.0037 (0.9797)</td>
<td>-0.0308 (0.2910)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.0037 (1.1711)</td>
<td>-0.0074 (0.2910)</td>
</tr>
<tr>
<td>Growth opp.</td>
<td>-0.0172 (0.4831)</td>
<td>-0.0308 (0.2910)</td>
</tr>
<tr>
<td>Risk</td>
<td>-0.4640 (0.0220)</td>
<td>-0.7389 (0.4289)</td>
</tr>
</tbody>
</table>

Risk -0.4640 -0.2186 -0.5040 -0.1781 -0.7389 -0.5828 -0.7430 -0.5504
(.0322) (.4027) (.0244) (.5168) (.0044) (.0605) (.0056) (.0097)

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Control Variables

The discussion of the control variables is based on the parameter estimates in Table 6 (Table 7 offers similar conclusions). First, we find that business start-ups in industries where assets have a higher collateral value raise a larger proportion of bank debt. From the supply side, banks may be wary of lending to first-time business start-ups. Indeed, adverse selection and moral hazard problems are likely to be an important consideration for banks, as these firms exhibit high failure rates and information asymmetries. However, when assets have a high collateral value, banks can reduce their exposure to these problems by securing their loans. The collateral value of assets for business start-ups 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). Yet, business start-ups that cannot obtain bank loans typically rely on noncollateralized trade credit (see also Huyghebaert and Van de Gucht 2007).

Firms operating in more profitable industries have a lower proportion of bank loans. However, profitability does not significantly affect overall leverage. Growth opportunities, when measured at the industry level, have no significant effect on initial financing decisions of business start-ups. Risk is significantly and negatively related to leverage. We also find that banks limit their lending to business start-ups in risky industries. 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, our results emphasize the importance of failure risk as a determinant of initial capital structure for 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 2007). When we use the entire population of industry incumbents during 1996–2001 to measure the control variables, our conclusions continue to hold (not reported). Alternatively, when we calculate the control variables using firm-specific data from the start-up year whenever possible—in particular, collateral value and profitability—we find that NFS relationship variables continue to have a robust influence on start-up capital structure, whereas risk loses some of its influence. If anything, these results point out that firm-level variables (collateral value and profitability) can better capture a firm’s risk profile than an industry-level proxy variable.

Consistent with research for mature, listed firms (e.g., Rajan and Zingales 1995; Wald 1999), 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 represent a larger fraction of firm value for smaller firms. Yet, start-ups with a greater need for external funds may have no alternative other than to raise debt, given that equity sources are not readily available. Finally, we find that larger business start-ups have a larger proportion of bank loans, ceteris paribus.

Additional Analyses and Robustness Checks

In this section, we discuss the findings from various additional analyses and robustness checks. These results are not reported but are available from the authors upon request. First, we examine the robustness of our conclusions when using the individual survey questions to measure the NFS liquidation costs and customer bargaining power variables. For this purpose, we calculate the correlation coefficients of these survey variables with leverage and debt mix. In addition, we estimate the multivariate models after replacing either NFS liquidation costs or customer bargaining power with the corresponding survey question.

The correlation coefficients and OLS parameter estimates for the NFS liquidation cost survey variables largely confirm our earlier conclusions. When products or services are more unique, difficult to copy, or differentiated from those of competitors, or when entrepreneurs emphasize or use new or advanced processes and technologies, start-up firms raise less debt. The results for the debt mix equation reveal the more limited effect of NFS liquidation costs on the proportion of bank loans in total debt outstanding. Business start-ups rely less on bank loans only when their products are differentiated from those of competitors or when firms emphasize or use new or advanced processes and technologies.
The individual survey questions for customer bargaining power show that firms have lower leverage and a smaller proportion of bank loans when customers are more involved in future product decisions. The ratio of bank loans to total debt is also significantly lower when the firm explicitly investigates whether its customers are satisfied with the quality of products and services, and when the management frequently discusses changes in consumers’ needs with employees. Overall, results are strongest for the debt mix equation, which is consistent with our earlier findings in Tables 6 and 7.

Next, we analyze whether the results differ when using customer identity (individuals vs. firms and governments) as a proxy for NFS liquidation costs. Professional customers are likely to have higher relationship-specific investments and thus liquidation costs, as the products and services they buy are used as an intermediate input in their own production process. In our sample, 32.84% of start-ups realize more than 25% of their sales from dealing with other corporations or the government. We find that the percentage of sales to professional clients is significantly and negatively related to leverage and the proportion of bank loans in total debt. Therefore, these results support our earlier findings and conclusions.

As we find that NFS relationship costs significantly affect both leverage and the debt mix, and as these capital structure components are often jointly determined, we estimate a model that incorporates the potential interactions between leverage and debt mix. For this purpose, we first instrumented start-up leverage and debt mix on their corresponding industry-level variables. This approach resulted in multicollinearity problems, rendering the capital structure components and control variables insignificant. Hence, we reestimated the simultaneous equations model using as instruments the residuals of a first-step auxiliary regression that removes the effects of the industry-level control variables on the corresponding industry-level capital structure components. Although these results must be interpreted with caution, they make clear that our main conclusions are robust.

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

VI. CONCLUSIONS

Business start-ups lack history and reputation in input and output markets, and face a high ex ante failure risk. Establishing relationships with these firms is therefore a high-risk venture for NFS, especially when they have to make large relationship-specific investments that will be lost if the firm is liquidated. Titman (1984) argues that firms with large NFS liquidation costs may limit their debt ratio to reduce the likelihood of future liquidation. Other theoretical studies show that firms may adjust 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 increase their survival chances and/or prevent potential NFS hold-up behavior (e.g., Sarig 1998). We provide compelling empirical evidence that NFS relationship costs are indeed a significant determinant of the initial financing decisions of business start-ups.

First, we find that the size of NFS liquidation costs is significantly and negatively related to leverage and, to a smaller extent, to the proportion of bank loans in total debt. Second, supplier bargaining power affects the relation between NFS liquidation costs and capital structure, as start-ups rely on even less debt when NFS liquidation costs are high and suppliers are powerful. In contrast, the interaction terms between NFS liquidation costs and customer bargaining power are never significant. Third, customer and supplier bargaining power negatively affect how much financing a start-up obtains from banks. Overall, these last results support Sarig’s (1998) conjecture that entrepreneurs, being concerned about strict bank liquidation policies, limit their vulnerability to NFS strategic actions ex ante by adjusting their capital structure. Indeed, to reduce the effects of customer and supplier bargaining power on the likelihood of NFS hold-up behavior and firm liquidation, firms limit their proportion of debt that consists of bank loans. Overall, our findings do not contradict those of earlier studies on mature, listed firms but rather illustrate the unique context of entrepreneurial start-ups.

Our empirical findings suggest some avenues for future research. Survival analysis could be used to determine whether start-ups that pay more attention to NFS liquidation costs and NFS bargaining power have a higher probability of being successful. It might also be instrumental to determine whether there are ways other than adjusting capital structure to decrease the effects of NFS relationship costs on firm value and survival. Arping and Lóránth (2006) show that firms can mitigate NFS liquidation concerns by reducing the uniqueness of their products. This notion could be important in the context of business start-ups, especially in traditional industries, as debt usually is the only available source of outside financing. For these firms, the opportunities to adjust capital structure to mitigate NFS relationship costs thus are not inexhaustible.
NOTES

1. Jensen (1986), for example, argues that free-cash-flow problems between managers and shareholders can be restrained by increasing leverage. Also, agency problems between creditors and shareholders can be reduced by raising the portion 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 concludes 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) and the proportion of bank loans (e.g., Houston and James 1996; Krishnaswami, Spindt, and Subramaniam 1999).

2. Titman and Wessels (1988), for example, point out that the negative relation between their uniqueness measure, which is based on the ratios of selling expenses to sales, R&D to sales, and job quit rates, and leverage may also be caused by the relation between this variable and nondebt tax shields on the one hand and the collateral value of assets on the other.

3. We recognize, however, that liquidation may not be a necessary condition for NFS to incur losses. Maksimovic and Titman (1991), for example, show that firms may ex post reduce the quality of their products to cut costs once they head for financial distress. As with liquidation costs, rational NFS will include these expected costs of financial distress in their terms of trade. Likewise, even when financial distress is remote, losses can be incurred because of a sub-optimal level of ex ante relationship-specific investments due to these types of ex post hold-up or sharing problems.

4. These NFS liquidation costs are thus different from the bankruptcy and liquidation costs that the firm itself incurs. Warner (1977), for example, concludes that direct costs, such as lawyers’ fees and management time lost during bankruptcy and liquidation procedures, are moderate (from 1% of market value seven years before bankruptcy to 5.3% immediately before bankruptcy). Altman (1984) finds that indirect costs, which include lost business and investment opportunities and inefficient asset sales are considerably larger, from 8.1% three years before bankruptcy to 10.5% in the year of bankruptcy. Andrade and Kaplan (1998) estimate that the total costs of financial distress are between 10% and 23% of pre-distress firm value for highly leveraged firms. To calculate the expected costs of financial distress, these estimates need to be multiplied by the probability of distress. After doing so, Almeida and Philippon (2007) conclude that the expected costs of financial distress amount to 4.5% of pre-distress value for BBB-rated firms.

5. When we use employee unionization rates to proxy for employee bargaining power, we indeed find no effect on the initial financing decisions of business start-ups. These results are not reported but are obtainable from the authors.

6. For 14 of 223 firms, the annual accounts were not included in the Belfirst database of Bureau Van Dijk and hence capital structure data were missing. These firms are likely to have been liquidated before they had to file their first financial statements.

7. Debt is defined as the sum of long-term debt and current liabilities. In our sample, 16.20% of entrepreneurs lent some money to their own firm, representing 17.12% of total debt in start-up accounts. Yet, we treat these entrepreneurial loans as a source of (preferred) equity rather than debt financing and thus do not include them in the calculation of the debt ratio. The reason is that entrepreneurs are unlikely to voluntarily file for bankruptcy whenever the debt-service payments on these loans can no longer be met. Indeed, unlike the United States, Belgium has a creditor-oriented bankruptcy law (see also La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1998). Therefore, debtors have no incentive to seek protection under it. Furthermore, most bankruptcy procedures in Belgium entail the firm’s liquidation rather than a reorganization of the distressed firm.

8. For this purpose, we include an industry dummy for each industry that contains at least five start-ups (see also Lally 2004).

9. An alternative explanation for this negative relation between supplier bargaining power and debt mix could be that suppliers with strong bargaining power grant less trade credit. We find no support for this conjecture, as the correlation coefficient between supplier bargaining power and the number of days of supplier credit is positive and insignificant.

10. Peterkort and Nielsen (2005) consider the book-to-market ratio as an alternative measure of risk, but this measure cannot be calculated for private enterprises.

REFERENCES


