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FIRM CHARACTERISTICS, DEBT MATURITY STRUCTURE, AND INNOVATION PERFORMANCE OF SMALL FIRMS

Alenka Slavec Gomezel
Ekonomska fakulteta Univerze v Ljubljani
alenka.slavec@ef.uni-lj.si

Abstract

Based on a large sample of 497 small Slovenian manufactory firms and applying structural equation modeling, we investigate the relationship between six different firm characteristics (firm legal status, firm age, assets tangibility, cash flow, long-term financing of long-term assets and inventories ratio, and the quick ratio) and debt maturity structure of small firms in terms of short-term debt and long-term debt. In addition, we uncover the relationship between debt maturity structure and innovation performance of small firms. The results of our study point to the importance of external financial sources for firm innovation performance and to the relevance of specific firm characteristics to explain debt maturity structure of small firms.

Keywords: *firm characteristics, debt maturity structure, small firms, innovation, short-term debt, long-term debt*

1 INTRODUCTION

Small firms are widely recognized as drivers of innovation (Bardos, Planes, Avouyi-Dovi, & Sevestre, 2002) and a vital determinant of the economic growth (Beck & Demirguc-Kunt, 2006) and competitiveness of a nation. For small firms to grow, develop, and innovate, it is important that an economy provides a supportive environment. In particular, having a supportive and efficient financial sector is crucial, but small firms still face obstacles in obtaining external funds (Ayyagari, Beck, & Demirguc-Kunt, 2007; Berger & Udell, 2006; Czarnitzki & Hottenrott, 2011; Qorraj, 2017). This leads researchers to focus their investigations on firm and owner determinants that influence small-firm financing in general, or to focus particularly on different types of financing, e.g., bank loans (e.g. Berger & Udell, 1998; Liao, Chen, & Lu, 2009), trade credits (e.g. Aaronson, Bostic, Huck, & Townsend, 2004; Cunat, 2007; Huyghebaert, Van de Gucht, & Van Hulle, 2007), venture capital (e.g. Davila, Foster, & Gupta, 2003), etc. By contrast, less attention has been paid to the relationship between a vast range of firm characteristics, including financial ratios, and the debt maturity of small firms in terms of short-term debt and long-term debt.

The motivation for this study comes from three sources. First, there is a shortage of research on the relationship between firm characteristics and the maturity structure of small-firm debt (González Méndez, 2013). Second, the predicative ability of firm indicators is an important source of information for the decisions a small firm to finance or not (Bottazzi, Secchi, & Tamagni, 2014). Third, such research has practical implications for firms that want to apply for external financial resources to fund their innovation activities. This study contributes to the entrepreneurial finance and innovation literature by better understanding the financial determinants of small-firm innovation performance. We highlight the need to make the financial market more accessible for small firms in order for firms to boost their innovation potential.

The rest of the paper is organized as follows. First, we develop our 16 research hypotheses by reviewing the literature based on which we present

the proposed model of small-firm financing through short-term debt and long-term debt. We continue with a brief explanation of the methodology, sample, and research data. Then we present research findings. The paper concludes with the discussion of results and recommendations for firms to obtain external financial sources.

2 THEORETICAL BACKGROUND

Although small firms are recognized as an important part of the economy (Berger & Frame, 2007), they face constraints in raising external financing. One of the main reasons is banks' preference to lend to a smaller number of large clients rather than to numerous smaller firms (Hyytinen & Vaananen, 2006) because of the higher failure risk faced by small firms. In order to compensate for the higher risk of failure and higher costs of information collection, lenders charge relatively high interest rates to smaller firms (Hyytinen & Pajarinen, 2007). Moreover, many studies revealed that the availability of external financial sources for small firms is constrained due to asymmetric information, opacity, moral hazard, adverse selection, non-obligatory auditing of financial statements, and insufficient availability of information for the public (Berger & Frame, 2007; Berger & Udell, 1998; Hyytinen & Vaananen, 2006; Vos, Yeh, Carter, & Tagg, 2007).

To mitigate or even avoid these unfavorable small-firm determinants, lenders take into consideration some typical firm and owner characteristics that help them in the lending decision process. However, the relationship between some firm characteristics, especially financial ratios calculated from financial statement data, and the availability of external financial sources (debt) and specifically the maturity of debt remains underexplored. Moreover, some scholars argue that debt is mainly a function of firm characteristics rather than owner characteristics (e.g. Coleman & Cohn, 2000). Astebro and Bernhardt (2003) also suggested that financial institutions focus on financial evidence of creditability, as opposed to information about owner capabilities. Furthermore, many studies analyzed how different indicators or financial ratios predict the survivor or failure of a firm and capture a graduation of the severity of credit problems that a firm and lender may face (e.g. Bottazzi et al., 2014; Slavec Gomezel, 2017; Zimmer, 1980). Thus, financial institutions and other lenders should take these indicators or financial ratios into account when lending to small firms, because these ratios have a great predicative ability. For these reasons, this paper focuses on firm characteristics, adding to the research some underexplored financial ratios and their relations to external debt.

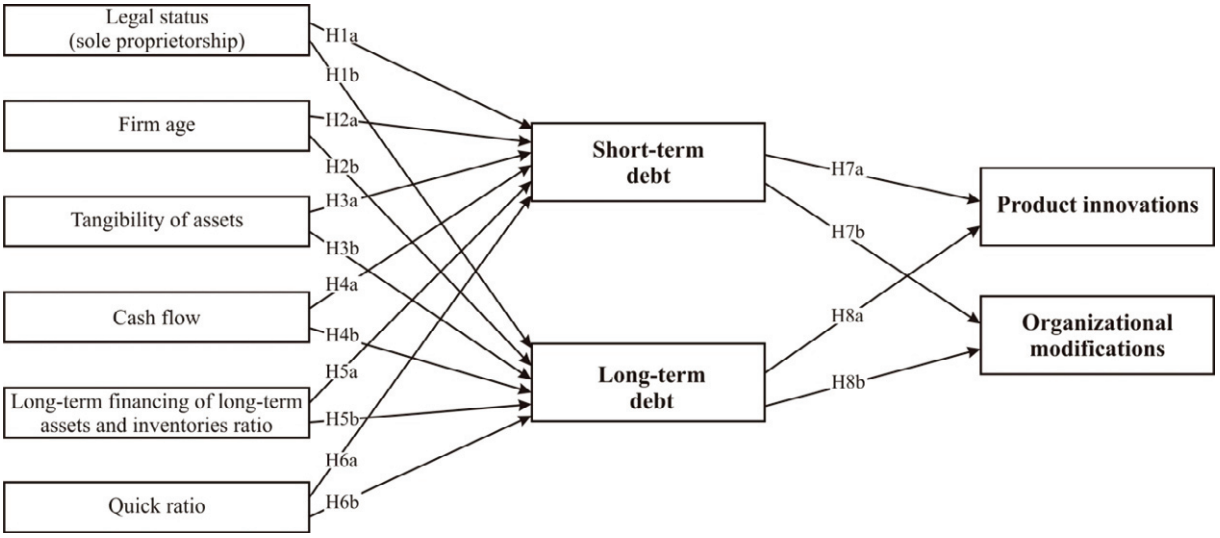
In addition to the lack of investigation of the relationship between financial ratios and small-firm financing in general, there is also a gap in the literature regarding the relationship between financial ratios and other firm characteristics and the maturity structure of debt, that is, short-term debt and long-term debt. Specifically, there is a need to clarify the relationships of cash flow, long-term financing of long-term assets and inventories ratio, and the quick ratio on short-term debt and long term-debt. Our research addresses this gap. We also investigate the relationship between short-term debt and long term-debt and innovation performance of small firms. The proposed structural model is shown in Figure 1, whereas the proposed hypotheses are presented in the continuation of the paper.

2.1 Legal status and debt maturity structure

Small firms in Slovenia are usually formed as sole proprietorships or limited liability companies, and only a minor portion of small firms are formed as incorporated companies. There are several reasons for this structure: the minimum capital requirement to establish an incorporated company is higher, bureaucratic costs and operations are substantial, financial statements need to be audited, and disclosure of information is obligatory.

When making a decision between a sole proprietorship and a limited liability company, several factors should be taken into account. Forming a sole proprietorship is easier because there is no need to pay in any start-up capital, whereas the capital requirement for a limited liability company amounts to EUR 7,500. Bureaucratic procedures for establishing a limited liability company are greater than those for a sole proprietorship, and

Figure 1: Conceptual model of small-firm financing through short-term debt and long-term debt



operating requirements and costs are higher for a limited liability company, as well. Managing a sole proprietorship is easier and less formal. On the other hand, a sole proprietorship does not have the status of an entity, and as such has less credibility from lenders' and other partners' points of view. Moreover, members of a limited liability company are not liable for the firm's liabilities with all of their property but only with their stake of capital paid in. However, lenders often require owners' personal guarantees for obtaining loans. Furthermore, the easy availability of limited liability provides an incentive for small-firm owners to undertake unduly risky ventures in the belief that they are protected and can shift the risk to others at no or little cost to themselves. Freedman (2000) argued that the costs of monitoring are lower for a limited liability company than for a sole proprietorship. All these factors lead us to the assumption that sole proprietorships have fewer external financial sources, as was shown by previous research (Coleman & Cohn, 2000; Petersen & Rajan, 1994; Storey, 1994). Moreover, we also assume that for the same reasons, sole proprietors will have fewer external financial sources in terms of short-term debt and long-term debt because sole proprietorship have less credibility and ability to settle debts. Based on this discussion, the first two hypotheses are postulated as follows:

Hypothesis 1a: *The legal status of the firm affects the debt maturity structure – sole proprietorships will get less short-term debt.*

Hypothesis 1b: *The legal status of the firm affects the debt maturity structure – sole proprietorships will get less long-term debt.*

2.2 Firm age and debt maturity structure

Petersen and Rajan (1994) found that leverage decreases with age, meaning that older firms borrow less because they finance their activities more with retained earnings. Similar findings were reported by Michaelas et al. (1999). Hall et al. (2000) proved that long-term debt is related positively to age, whereas short-term debt is negatively related to age. Hall et al. (2004) found significant evidence that older SMEs in Spain, the UK, and Italy rely more on internally generated funds, because the relationship between age and long-term debt was statistically significant and negative. Based on the findings of these studies, two more hypotheses are postulated:

Hypothesis 2a: *Age is negatively related to debt – older firms borrow less on a short-term basis.*

Hypothesis 2b: *Age is negatively related to debt – older firms borrow less on a long-term basis.*

2.3 Tangibility of assets and debt maturity structure

Tangible assets, which a firm owns, are an important source of securing debt. These assets can be pledged as collateral (Salgador, Brito, & Donate, 2011). Collateral lowers monitoring costs, which are experienced as a consequence of moral hazard and adverse selection (Jimenez, Salas, & Saurina, 2006; Stiglitz & Weiss, 1981). Thus, a firm with a larger proportion of tangible assets (land, factories, engines, etc.) to total assets will more often apply for credit because it has more collateral to offer.

Several authors (e.g., Leeth & Scott, 1989; Salgador et al., 2011) argued that the longer the maturity of debt, the higher is the probability of collateral requirements for a firm. Moreover, debt secured with tangible assets is positively linked with debt maturity (Leeth & Scott, 1989). Chittenden et al. (1996) pointed out that a high fixed-asset component and a high inventory level are associated with higher short-term and long-term debt, leading to the conclusion that small firms with a high proportion of fixed assets are able to raise higher levels of debt financing. Although more tangible assets as a proportion of total assets suggests a higher chance of approved long-term debt, Michaelas et al. (1999) found a positive relationship between the tangibility of assets and short-term debt. On the other hand, Chittenden et al. (1996) and Van der Wijst and Thurik (1993) argued that there is a negative relationship between tangible assets and short-term debt, and a positive relationship between tangible assets and long-term debt. The same results were confirmed by Hall et al. (2000, 2004), who found that long-term debt is positively related to asset structure (ratio of tangible assets to total assets) and short-term debt is negatively related to asset structure.

Based on this discussion, we can assume that firms with a higher proportion of tangible assets to total assets will have a less-constrained access to debt financing because tangible assets can be pledged as collateral. A larger volume of collateral thus predicts a higher probability of approved long-term debt. On the other hand, some scholars found that a larger proportion of tangible assets to total assets is negatively associated with short-term debt. Therefore we postulate the next two hypotheses:

Hypothesis 3a: *Tangibility of assets is negatively related to short-term debt.*

Hypothesis 3b: *Tangibility of assets is positively related to long-term debt.*

2.4 Cash flow and debt maturity structure

Cash flow, which is determined as profits plus depreciation, represents an internally generated source of financing (Rivaud-Danset, Dubocage, & Salais, 1998) that can eventually assure the solvency of a firm or can act as a safety reserve in case of crises. On the other hand, cash flow can convey valuable information about a firm's investments decisions (Rodríguez, Muiño, & Lamas, 2012), and communicates to lenders the financial health and stability of the firm (Rivaud-Danset et al., 1998).

The pecking order theory suggested by Myers (1984) supposes that firms finance their needs in a hierarchical order, first using internally available funds, followed by debt, and finally external equity. This preference reflects the relative costs of the various sources of financing, due to the existence of information asymmetries. The pecking order hypothesis is particularly relevant for small firms because the costs of external equity may be higher for small firms than for larger ones (Michaelas et al., 1999) and have the additional weakness of losing the total control of the firm because new stock owners come into the firm (Stiglitz & Weiss, 1981). The most favorable financial sources for small firms are those generated in the firm. This indicates that firms which generate enough funds for further investment and growth internally will not need to borrow outside the firm (Degryse, de Goeij, & Kappert, 2012). This can lead to the assumption that larger cash flows are negatively related to external financial sources in terms of short-term debt and long-term debt. This assumption has been applied by different scholars. Hall et al. (2004), for example, suggested that with regard to profitability, it is assumed that internally generated funds are preferred to externally generated funds, and therefore profitability is negatively correlated with the amount bor-

rowed by firms in both the long and the short terms. In other words, a firm which can generate more earnings will borrow less, all things being equal (Adedeji, 1998; Hall et al., 2004; Rodríguez et al., 2012). Hall et al. (2004) showed a negative association between profitability and short-term debt, whereas there was no significant association between profitability and long-term debt. Based on this discussion, our next hypotheses are postulated:

Hypothesis 4a: *Cash flow is negatively related to short-term debt.*

Hypothesis 4b: *Cash flow is negatively related to long-term debt.*

2.5 Long-term financing of long-term assets and inventories ratio and debt maturity structure

The obtained values of the ratio of long-term financing of long-term assets and inventories indicate the solvency of the firm in a given moment. With this ratio we show the long-term financing of long-term assets and of the least-liquid short-term assets – inventories. Indirectly, it shows us two things: (1) the adjustment of the structure of assets and the structure of liabilities and (2) the surplus of long-term liabilities over long-term assets. The recommended value of the long-term financing of long-term assets and inventories ratio is higher than or equal to 1. This suggests that firms finance long-term assets and the proportion of inventories that is necessary for unconstrained firm operations with long-term liabilities.

Chittenden and Bragg (1997) argued that long-term debt represents only a minor percentage of a firm`s liabilities. According to the pecking order theory, SMEs prefer internal funds over external funds (Degryse et al., 2012). Consequently, long-term assets are predominantly financed by equity and short-term debt. Furthermore, if a firm finances its inventories and long-term assets with long-term financial sources, it will not need short-term financial sources for financing inventories and long-term assets. This leads us to the assumption that the long-term financing of long-term assets and inventories ratio will have a negative association with short-term debt. Higher values of the long-term financing of long-term assets and inventories ratio also suggest that in the extreme case a firm will finance all assets, including short-term assets other than inventories, with long-term liabilities. In this case a firm will not need additional debt and the long-term financing of long-term assets and inventories ratio will have a negative association with further indebtedness of a firm, which leads us to the postulation of these two hypotheses:

Hypothesis 5a: *Long-term financing of long-term assets and inventories ratio is negatively related to short-term debt.*

Hypothesis 5b: *Long-term financing of long-term assets and inventories ratio is negatively related to short-term debt.*

2.6 Quick ratio and debt maturity structure

The basis on which to calculate ratios for short-term financial equilibrium estimation is a sub-balance which presents short-term assets and short-term liabilities. However, adjustment of the structure of assets and liabilities does not ensure financial liquidity of the firm. Thus, the level of cash and highly liquid assets (marketable securities) compared to short-term liabilities is also of high importance. The quick ratio shows whether or not the most liquid assets are financed with short-term liabilities.

If the value of the quick ratio exceeds 1, this means that in addition to inventories, more liquid assets are being financed with long-term liabilities. Higher quick ratios suggest higher solvency of firms, which from the lender's point of view acts as an accelerator in the lending process. However, from the firm's point of view, higher liquidity means less reliance on borrowers, because firms have enough financial sources. Thus, we presume that the latter effect will prevail, and therefore we expect a negative relationship between the quick ratio and short-term and long-term debt. Consequently, the next two hypotheses are postulated as follows:

Hypothesis 6a: *Quick ratio is negatively related to short-term debt.*

Hypothesis 6b: *Quick ratio is negatively related to long-term debt.*

2.7 Debt maturity structure and innovation performance

The direct relationship between the debt maturity structure of small firms and their innovation performance is still understudied. In this section, we review some relevant research results that will facilitate postulating our last four research hypotheses.

Serveral scholars have found that financing is positively related to small-firm growth (Beck, Demirguc-Kunt, & Maksimovic, 2005; Campello, 2006; Petersen & Rajan, 1997) and that innovation performance is related to growth (Antončič, Prodan, Hisrich, & Scarlat, 2007; Hult, Hurley, & Knight, 2004); thus it can be assumed that financing also is related to the innovation performance of small firms. Specifically, small firms that correctly align their financing mix to their R&D focus perform better than their counterparts which are misaligned (Robb & Seamans, 2014). Moreover, some scholars (e.g. Brown, Fazzari, & Petersen, 2009; Delmas, 2002; Galia & Legros, 2004; Mendonca, 2004) found that lack of external financial sources, either short-term or long-term, hinders the innovation performance of firms. The radicalness of innovation activities is also important when choosing whether or not to finance innovations (Nanda & Rhodes-Kropf, 2017). Based on these findings, the hypotheses regarding maturity structure and innovation performance are postulated as follows:

Hypothesis 7a: *Short-term debt is positively related to innovation performance of small firms in terms of product innovations.*

Hypothesis 7b: *Short-term debt is positively related to innovation performance of small firms in terms of organizational modifications.*

Hypothesis 8a: *Long-term debt is positively related to innovation performance of small firms in terms of product innovations.*

Hypothesis 8b: *Long-term debt is positively related to innovation performance of small firms in terms of organizational modifications.*

3 METHODOLOGY

In this part of the paper we discuss the methodology used in our study in terms of sampling and data analysis and in terms of operationalization and measure validation.

3.1 Sample and data analysis

The research sample consisted of entrepreneurs who answered a survey. The survey was developed using Dillman`s tailored design method (Dillman, 2000). A total of 2,200 surveys were mailed to randomly selected executives of small Slovenian firms in the manufacturing industry. All valid returned surveys were then complemented with the financial data of the firms whose owners answered the survey. The final research sample consisted of 497 entrepreneurs. Each entrepreneur was associated with a firm for which we had financial data from balance sheets and income statements.

Exploratory factor analysis and reliability analysis were performed in SPPS statistical software, whereas confirmatory factor analysis and testing of the proposed structural models were conducted with structural equation modeling using EQS (Multivariate Software) version 6.1. The ERLS method was used because a small amount of non-normality was found in the data. As recommended by several scholars (Breckler, 1990; Shook, Ketchen, Hult, & Kacmar, 2004), the fit of the model was assessed with multiple indices. These indices were NFI, NNFI, CFI, GFI, SRMR, and RMSEA. Values of NFI, NNFI, CFI, and GFI higher than 0.90 indicate a good model fit (Byrne, 2006; Hair, Black, Babin, & Anderson, 2009), whereas values of SRMR lower than 0.08 indicate an acceptable fit (Hu & Bentler, 1999). Finally, RMSEA values lower than 0.05 indicate a good fit, and values as high as 0.08 represent reasonable errors of approximation in the population (Hair et al., 2009).

3.2 Operationalization and measure validation

Independent variables – the six investigated firm characteristics – were obtained from questionnaires and from firms' financial statements. Legal status of the firm was measured with a dichoto-

mous variable, where sole proprietorship received a value of 1, and other legal statuses, e.g., limited liability company received a value of 0. Firm age was measured with the number of years from the firm's establishment. Tangibility of assets was measured by the percentage of tangible assets in total assets. Cash flow, the long-term financing of long-term assets and inventories ratio, and the quick ratio were calculated using formulas from the Slovenian Accounting Standards and the corresponding items from the firms' balance sheets.

The two dependent variables – short-term debt and long-term debt – were measured with corresponding items from firms' balance sheets.

Organizational modification and product innovations were presented in the model as latent variables, which were measured by multiple indicators. Organizational modifications were measured with three items. Respondents were asked to rate the extent to which they agreed with the following statements: (1) Our company abandoned non-profit business in the last three years; (2) Our company set up new businesses in the last three years; and (3) Our company invested seed funds in the initial entrepreneurial activities in the last three years. The extent to which respondents agreed or disagreed with the statements was measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Product innovations were measured with seven items. Respondents were asked to rate the extent to which they agreed with the following statements: (1) In the past three years our company has obtained a greater number of patents than our main competitors; (2) In the past three years our company has initiated on the market a large number of new products or services (more than the average in the industry); (3) In the past three years our company has invested in research and development a large amount of funds (more than the average in the industry); (4) In the past three years our company has invested more funds in the development of new products or services than our competitors; (5) Our company has found new niches in existing markets in the past three years; (6) In the past three years our company has led the development of key innovations in the industry; and (7) In order to recognize an opportunity, we test a lot of different ideas. The extent to which respondents agreed or disagreed with the statements was measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4 RESULTS

Results indicated that the proposed model of small-firm financing through short-term debt and long-term debt provided a good fit to the data (NFI = 0.91; NNFI = 0.92; CFI = 0.94; GFI = 0.91; SRMR = 0.07; and RMSEA = 0.06). Structural equations with standardized coefficients are shown in Table 1. Examination of the hypotheses related to the model of small-firm financing through short-term debt and long-term debt is presented in the following paragraphs and summarized in Table 2.

Hypothesis 1 looked at the relationships between the legal status of the firm and short-term debt (H1a) and between the legal status of the firm and long-term debt (H1b). Empirical results were found to support Hypothesis 1a (a negative and significant standardized coefficient of −0.27) and Hypothesis 1b (a negative and significant standardized coefficient of −0.26). These results indicate that sole proprietorships received less short-term debt and long-term debt than did limited liability companies and incorporated firms in the sample.

Hypothesis 2 proposed that firm age would be negatively related to external financing in terms of short-term debt (H2a) and long-term debt (H2b), meaning that young firms borrow more on a short-term basis and on a long-term basis than do older ones. Empirical results were not found in support of Hypotheses 2a and 2b.

Hypothesis 3 investigated the relationship between a higher proportion of tangible assets to total assets and short-term debt (H3a) and long-term debt (H3b). Hypothesis 3b was supported, because the results indicated a significant positive relationship between the percentage of tangible assets in total assets and long-term debt (positive and significant standardized coefficients of +0.46). Hypothesis 3a was not supported (non-significant standardized coefficient of +0.04).

Table 1: Structural equations for the model of small-firm financing through short-term debt and long-term debt

Independent variables	Dependent variables			
	Short-term debt	Long-term debt	Product innovations	Organizational modifications
Legal status (sole proprietorship)	−0.27*	−0.26*		
Firm age	+0.05	−0.04		
Tangibility of assets	−0.04	+0.46*		
Cash flow	−0.08#	−0.09*		
Long-term financing of long-term assets and inventories ratio	−0.16*	+0.06		
Quick ratio	−0.19*	−0.10*		
Short-term debt			0.23*	0.30*
Long-term debt			0.11#	0.11#
Error	0.92	0.88	0.95	0.93
R-squared	0.16	0.23	0.09	0.13
*Note: * denotes Sig. < 0.05; # denotes Sig. < 0.10.*				

The results supported Hypothesis 4, which looked at the relationships between cash flow and short-term debt (H4a) and long-term debt (H4b). As indicated in Table 1, cash flow was negatively and significantly related to long-term debt (standardized coefficient of −0.09) and only partially related to short-term debt (standardized coefficient of −0.08 which was statistically significant only at the 10% level).

The results showed statistically significant support for Hypothesis 5a, which looked at the relationship between the long-term financing of long-term assets and inventories ratio and short-term debt (a negative standardized coefficient of −0.16), but no support was found for Hypothesis 5b, which looked at the relationship between the long-term financing of long-term assets and inventories ratio and long-term debt.

Hypothesis 6 looked at the relationships between the quick ratio and short-term debt (H6a) and between the quick ratio and long-term debt (H6b). Empirical results supported Hypothesis 6a (a negative and significant standardized coefficient of −0.19) and Hypothesis 6b (a negative and significant standardized coefficient of −0.10).

The last four hypotheses examined the relationships between debt maturity (short-term debt and long-term debt) and innovation performance of small firms. As indicated in Table 1, short-term debt was strongly, positively, and significantly related to the innovation performance of small firms in terms of product innovations (H7a, standardized coefficient of +0.23) and organizational modifications (H7b, standardized coefficient of +0.30). Finally, the results of the study indicated that the association between long-term debt and innovation performance of small firms in terms of product innovations and organizational modifications is statistically significant and positive only at the 10% level (H8a, standardized coefficient of +0.11; and H8b, standardized coefficient of +0.11).

5 DISCUSSION AND CONCLUSION

Small firms face constraints in obtaining external financial sources. Thus, understanding which and how a firm's characteristics are related to small-firm financing decisions and the availability of external financial sources for small firms has led us to an in-depth analysis of the relationship between six firm characteristics and the maturity structure of

Table 2: Results of hypotheses testing for the model of small-firm financing through short-term debt and long-term debt

Hypothesis	Independent variable	Predicted relationship	Dependent variable	Result
H1a	Legal status (sole proprietorship)	–	Short-term debt	☑
H1b		–	Long-term debt	☑
H2a	Firm age	–	Short-term debt	☒
H2b		–	Long-term debt	☒
H3a	Tangibility of assets	–	Short-term debt	☒
H3b		+	Long-term debt	☑
H4a	Cash flow	–	Short-term debt	☑*
H4b		–	Long-term debt	☑
H5a	Long-term financing of long-term assets and inventories ratio	–	Short-term debt	☑
H5b		–	Long-term debt	☒
H6a	Quick ratio	–	Short-term debt	☑
H6b		–	Long-term debt	☑
H7a	Short-term debt	+	Product innovations	☑
H7b		+	Organizational modifications	☑
H8a	Long-term debt	+	Product innovations	☑*
H8b		+	Organizational modifications	☑*
Legend: ☑ The hypothesis was confirmed at 5% significance.				
☑* The hypothesis was confirmed at 10% significance.				
☒ The hypotheses was rejected.				

debt used by small firms. Specifically, we analyzed the relationship between the legal status of the firm, firm age, tangibility of assets, cash flow, long-term financing of long-term assets and inventories ratio, and the quick ratio and short-term debt and long-term debt. Moreover, we also analyzed the relationship between short-term debt and long-term debt and innovation performance in terms of product innovations and organizational modifications. Until now, some of these relationships had not been investigated. Therefore, there are several important observations regarding the results of our study.

The firm characteristic with the highest regression coefficient significantly related to maturity of debt was the tangibility of assets. Although it was positively related only to long-term debt, the result is not surprising because short-term debt is less often secured with collateral. This result implies that firms seeking long-term debt should have enough tangible assets in the form of land, factories, machines, and equipment.

The results of the study also suggest that the legal status of the firm matters when applying for short-term and long-term debt. Lenders prefer financing firms with the legal status of an entity rather than sole proprietorships. This builds trust in the dynamic relationship between lenders and firms. Thus, we suggest that firms transform their legal status from sole proprietorships to limited liability companies if the benefits of being a limited liability company, other than an easier way to obtain external financing, prevail over the benefits of being a sole proprietorship. Advantages and disadvantages of sole proprietorships and limited liability companies were extensively discussed in the paper. Another suggestion for sole proprietorships is to also establish a limited liability company and gradually transfer business operations from the sole proprietorship to the limited liability company. This will eventually facilitate gaining external financial sources, new partners, and new business because the credibility and soundness of the business will increase.

An additional contribution of this research is the investigation of the relationship between cash flow and short-term and long-term debt, because these relationships have not been the center of attention of previous research. The results suggest that small firms with substantial internally generated funds do not have to rely on external financial sources. Own financial funds are less expensive and are not binding for a company because credit approved by external lenders has to be repaid at given deadlines and amounts. These results are consistent with results of scholars who dealt with the relationship between profitability and external financial sources. Those scholars found a negative relationship between profitability and external financial sources because firms generate enough funds internally (Chittenden et al., 1996; Hall et al., 2004; Jordan, Lowe, & Taylor, 1998; Van der Wijst & Thurik, 1993).

Another interesting result arose from the investigation of the relationship between two ratios – the long-term financing of long-term assets and inventories ratio and the quick ratio – and short-term debt and long-term debt. These two ratios cover all items in a balance sheet – the long-term financing of long-term assets and inventories ratio captures long-term assets and long-term liabilities, and short-term inventories, whereas the quick ratio captures all short-term assets without inventories and short-term liabilities. The long-term financing of long-term assets and inventories ratio was related only to short-term debt. This relationship was negative as predicted, which is rational because the ratio excludes short-term financial sources and is negatively related to them. Moreover, in an extreme case a firm may finance all assets, including short-term assets, with long-term liabilities. Interestingly, the quick ratio was negatively and significantly related to both short-term debt and long-term debt, which was also a predicted relationship. In an extreme and only theoretical case, a firm may finance all its assets, including long-term assets, with short-term liabilities. However, attention is needed when dealing with financial ratios because it is important to accurately understand and correctly interpret each ratio and appropriately make use of them (e.g., Abdel-Khalik, 1973; Zimmer, 1980).

Finally, an important contribution to the entrepreneurial and financing literature is the investigation of the relationship between short-term and long-term debt and innovation performance of small firms. The results of the present study confirmed our assumption of the positive relationship between external financial sources and innovation performance of small firms in terms of product innovations and organizational modifications. For their innovation activities, firms need additional financial sources because engaging in innovation activities require substantial funds. Thus, it is recommended that external financial sources are more affordable for smaller firms.

To conclude, we emphasize the importance of building long-term and honest relationships between lenders and firms, because this brings trust and commitment and might make financial resources more affordable and firms more able to innovate.

EXTENDED SUMMARY/IZVLEČEK

Namen prispevka je predstaviti pomen šestih značilnosti majhnega podjetja (pravno-organizacijska oblika podjetja, starost podjetja, delež opredmetenost osnovnih sredstev v sredstvih podjetja, denarni tok, kazalnik dolgoročne pokritosti dolgoročnih sredstev in zalog ter pospešeni koeficient) za njegovo strukturo ročnosti dolga (kratkoročni dolg in dolgoročni dolg). V prispevku avtorji razkrivajo, kakšna je povezava med ročnostjo dolga majhnega podjetja in inovativnostjo majhnega podjetja. Avtorji so razvili osem parov hipotez in jih empirično testirali na vzorcu 497 majhnih slovenskih podjetij iz predelovalne dejavnosti. Empirične analize so bile izvedene s pomočjo strukturnega modeliranja enačb. Rezultati analize so pokazali, da ima zunanje financiranje velik pomen za inovativnost majhnih podjetij ter da sta kratkoročni dolg in dolgoročni dolg pomembno povezana z značilnostmi podjetja.

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