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ABSTRACT

How does a founder's knowledge of debt financing influences his/her new firm's ability to obtain the amount of debt financing it desires? Building on the cognitive psychology literature, we propose that the depth of a founder's debt financing knowledge is positively associated with the new firm's ability to obtain debt financing as he/she will be better in selecting and acquiring relevant sources of debt financing. Integrating insights on entrepreneurial growth-oriented strategies, we further argue that this relationship will be more pronounced when the new firm internationalizes and innovates more. Using a Heckman full-information-maximum-likelihood (FIML) model, we analyze survey data on 1,845 Flemish new firms. The first stage of the model estimates the new firm's probability to raise debt financing. The second stage tests the relationship between the founder's knowledge depth of debt financing and the new firm's debt financing ability conditional on the decision to raise debt financing. We find that the founder's knowledge depth of debt financing is positively associated with the new firm's ability to obtain debt financing. This association becomes even more pronounced when the new firm internationalizes more. These findings extend the entrepreneurial finance, entrepreneurial strategy, and cognitive psychology literature.

INTRODUCTION

Obtaining finance is one of the key conditions to successfully build and grow new firms (Cumming *et al.*, 2019; Levasseur *et al.*, 2022). Researchers have been trying to understand what determines new firms' financial decision-making and their ability to obtain the external funds they desire (e.g.,

Cole and Sokolyk, 2018; Cosh *et al.*, 2009, Cowling *et al.*, 2022; Baltas *et al.*, 2022). Much attention has been given to the *supply side*, and in particular to how the availability and costs of external capital affect the financing of new firms. However, by solely relying on these supply side constraints, finance theories can only explain a small share of the observed variation in new firms' financial decision-making and ability to obtain external funds (Fraser *et al.*, 2015). As new firm founders are the main decision-makers in new firms (Brinckmann *et al.*, 2011; Koropp *et al.*, 2013), recent literature has recognized that we also need an investigation of the *demand side* to fully explain new firms' financing decisions (De Rassenfosse and Fischer, 2016; Dutta and Mallick, 2022). Accordingly, scholars have started to investigate the role of founder characteristics. For example, better educated and more experienced founders make better financial decisions (Seghers *et al.*, 2012) and are more positively perceived by external financiers (Hsu *et al.*, 2014; Piva and Rossi-Lamastra, 2018), especially if they have successful prior new firm founding experience or prominent social network ties (Hsu, 2007; Ko and McKelvie, 2018). Also other founder characteristics such as gender (Dutta and Mallick, 2022; Wilson et al., 2007), optimism or planning fallacy (Adomdza *et al.*, 2016), strategic goals (Chaganti *et al.*, 1996), passion (Chen *et al.*, 2009), risk-taking propensity (Barton and Gordon, 1987), and willingness to keep control over the firm (Mueller, 2008) have been found to affect financial decision-making and founders' ability to obtain external funds.

Though these studies have yielded valuable insights, they have failed to encompass the role of founders' financial knowledge (or a lack thereof) to explain the financing of new firms (Calcagno, *et al.*, 2019; Graña-Alvarez *et al.*, 2022; Van Auken, 2005). This is surprising as research on household financial management shows that an individual's awareness and

understanding of financial products or services is a key antecedent of informed financial decision-making such as retirement planning, investment and stock market participation, and wealth accumulation (Lusardi and Mitchell, 2014, 2017). Whereas recent work has recognized the importance of investors' financial knowledge (e.g., Croce *et al.*, 2020; Meoli *et al.*, 2022), only two studies have investigated the importance of entrepreneurs' financial knowledge and its consequences. Van Auken (2001) studied entrepreneurs' familiarity with different sources of equity capital. He observed 142 US small technology-based firms and found that the less familiar entrepreneurs were with these sources of equity, the less capable they felt in negotiating equity capital investments. Koropp et al. (2013) found a positive relationship between entrepreneurs' financial knowledge and their attitudes toward debt financing. While these studies provide interesting insights, they have solely focused on entrepreneurs' *attitudes* towards and *perceptions* of external financing sources, without measuring the actual impact of financial knowledge on their firm's *actual ability* to obtain external finance. This is important as it is the actual financing obtained that matters for the launch and growth of new firms.

This paper investigates the relationship between a founder's knowledge of debt financing and the firm's ability to obtain the debt financing it desires. We focus on debt, as it is the most commonly used form of external financing in new firms (Deloof and Vanacker, 2018; Robb and Robinson, 2014). It is cheaper and easier to access than equity and does not entail a loss of control and ownership (Huyghebaert and Van de Gucht, 2007). Debt is related to higher success of new firms in terms of survival and revenue growth (Cole and Sokoloyk, 2018). However, a significant minority of these firms still faces challenges to access debt (Cowling *et al.*, 2016). We build on cognitive psychology literature (e.g., Dane, 2010; Larrick and Feiler, 2015) to argue that the *depth*

of a founder's debt financing knowledge (i.e., *how well* the founder knows debt financing sources) will positively relate to the new firm's ability to obtain the desired amount of debt, as founders with deeper knowledge will be better at identifying/selecting relevant debt sources and at negotiating with/convincing debt providers. Moreover, whereas previous work has shown that financial resources are used to further advance new firms' growth-oriented strategies (Paeleman *et al.*, 2017), we propose that growth-oriented strategies – in particular, internationalization and innovation – positively moderate the relationship between founders' knowledge depth of debt financing and the firm's ability to obtain the desired amount of debt. To test our hypotheses, we use survey data on 1,845 new firms in Flanders, Belgium.

This study makes important contributions. First, contributing to the entrepreneurial finance literature, our work identifies a founder's deep knowledge of debt financing as an important factor that determines the new firm's ability to obtain the external funds desired as he/she will be better in selecting and acquiring relevant sources of debt financing. We also identify boundary conditions for this relationship, namely the firm's engagement in growth-oriented strategies. Our study answers calls raised in the entrepreneurial finance literature to test alternate predictors of new firms' financing (Hanssens *et al.*, 2016), and specifically to pay more attention to demand-side factors and cognition in particular (Cumming and Johan, 2017; Fraser *et al.*, 2015). More broadly, this study fills a gap in the literature by highlighting the importance of financial literacy in the context of new firms. Existing studies on financial literacy largely refer to households and personal finance (Graña-Alvarez *et al.*, 2022). Moreover, our study also extends international entrepreneurship (Prashantham and Floyd, 2019; Schwens *et al.*, 2018; Verbeke and Ciravegna, 2018) and innovation (Dahlander *et al.*, 2016; Srivastava *et al.*, 2020) literature. While prior work

in this area pointed to the role of individual-level cognition for the identification of new opportunities (Acedo and Jones, 2007), our work indicates that cognitive factors also allow entrepreneurs to mobilize the necessary resources to exploit these opportunities. Finally, using a sample of real world decision-makers to study (organizational) decision making, our study extends experimental insights from cognitive psychology literature (Dane et al., 2012).

THEORETICAL DEVELOPMENT

In contrast to assumptions of traditional corporate finance theories, entrepreneurs typically have limited knowledge of finance alternatives (Seghers *et al.*, 2012). Contrary to intuition, entrepreneurs often fail to compensate for their lack of knowledge by seeking support from external consultants (Calcagno et al., 2019), either due to a lack of awareness about their own knowledge gaps or because the cost of external advice is perceived as prohibitively high (Calcagno and Monticone, 2015; Stolper and Walter, 2017). Instead, they rely on their simplified knowledge structures (or mental models) of reality to make sense of their environment, which affects the way they perceive and process information, solve problems, and take decisions (Gary and Wood, 2011). In the following section, we argue that entrepreneurs' knowledge structure of debt financing will affect the financing decisions they take and how they are perceived by debt capital providers.

Knowledge structures and debt financing: The role of knowledge depth

According to cognitive psychology literature, an individual's knowledge (or mental model) is structured into (more or less) interlinked knowledge domains with varying compositions of knowledge attributes (Dane, 2010; Fiske and Taylor, 1991). For instance, an entrepreneur's knowledge of debt financing may encompass various knowledge *domains* such as bank loans, leasing, trade credit, bank overdrafts or mixed credit lines. Each knowledge domain is organized

in one or more *schemas* consisting of different knowledge *attributes* and the *linkages* among those attributes. For example, an entrepreneur's knowledge domain of bank loans may entail knowledge schemas regarding the different banks that exist, the criteria that banks use to grant a loan, and the information that needs to be prepared to obtain a loan. Each of these schemas consists of different knowledge attributes. A knowledge schema on the criteria that banks use to grant a loan, for example, may entail knowledge attributes regarding the importance and assessment of the applicant's character (i.e., credit history), capital, collateral, and capacity to repay the bank loan, as well as the conditions of the bank loan, such as the amount involved, interest rate, how the money will be used and which industry the new firm is active in (typically referred to as the "five C's of credit") (Bruns *et al.*, 2008; Wilson *et al.*, 2007). A knowledge schema on the different banks that exists may entail knowledge attributes regarding, for example, the quality of each bank's service and its international presence.

The extent to which an individual's knowledge about a specific knowledge domain consists of more schemas, attributes, and linkages between these schemas and attributes, is called *knowledge depth* (Campbell, 1960; Mannucci and Yong, 2018). Cognitive psychology literature has shown that individuals become more effective decision-makers when possessing richer and more complex (i.e., *deeper*) knowledge structures (Ericsson, 2018). Without deep knowledge, decisions may be based on assumptions, biases, or incomplete information (Epstein, 1994). With deeper knowledge, the number of knowledge attributes and the corresponding linkages within each schema increases, which enables individuals to see a larger number of potential alternatives (Amabile, 1983; Dane, 2010), accurately evaluate these alternatives' costs and benefits, and select the more promising alternatives from this set (Alexander, 1979; Larrick and Feiler, 2015). For

instance, experiments show that chess experts, who possess superior chess knowledge compared to novices, can think of better moves when confronted with a chess position (Gobet and Simon, 1996; Saariluoma, 1992).

Building on these insights from cognitive psychology, we argue that founders with deeper knowledge of debt financing will be better at selecting and acquiring relevant sources of debt financing. For example, a founder with deep knowledge of bank loans will know that different banks use different criteria and offer different conditions, based on how and where the firm plans to use the money. In general, an entrepreneur's deep knowledge of a specific type of debt financing implies a greater understanding of the availability and the respective costs and benefits of that particular debt instrument given the new firm's current situation (for a discussion, see Huyghebaert and Van de Gucht (2007) on trade credit and Cosci *et al.*, (2015) on asset leasing). This means that founders with deep knowledge of debt financing sources can, for instance, more easily assess whether specific financing conditions (e.g., a specific loan granted by a specific financial institution) are favorable or not. As such, founders with deep knowledge of debt financing sources will be especially effective at identifying and selecting relevant debt financing sources and hence at making debt financing decisions.

Founders with deeper knowledge will also be better at negotiating with and convincing debt providers (Van Auken, 2001). In general, new firms have difficulties to obtain debt financing due to information asymmetries between new firms and debt providers (Berger and Udell, 1998; Cosh *et al.*, 2009). New firms lack a historical track record and objective firm, sector, and market information on the new firm is often unavailable to debt providers (Wiklund *et al.*, 2010). This difficulty in assessing a new firm's quality poses a challenge for debt providers (Hyytinen and

Pajarinen, 2008). Furthermore, new firms typically lack routines, skills, information and resources (Paeleman and Vanacker, 2015) – a phenomenon known as the "liability of newness" – which result in higher failure rates and higher uncertainty surrounding new firms (Fisher *et al.*, 2020). The debt financing knowledge of founders may be crucial to convince debt providers to finance a new firm in spite of this information opacity and uncertainty. This is because, when debt providers decide to finance new firms, they typically do so by relying on soft information about founders' competencies. Soft information serves as a signal regarding the quality of the founder and the new firm, thereby mitigating information asymmetries and reducing risk (Howorth and Moro, 2006). For example, a founder that demonstrates deep knowledge of the criteria that different banks use, the different conditions they offer, and on the fact that these criteria and conditions depend on how and where the firm plans to use the money, signals to the bank that he/she is well-informed and competent and that there is a decent chance that his/her new firm will be able to pay back the bank loan. Overall, we propose that deeper knowledge of debt financing alternatives entails more comprehensive knowledge structures of these debt financing sources, which improves the new firm's ability to assess the appropriateness of these debt financing alternatives and to convince debt capital providers to provide them. Thus,

> *Hypothesis 1: The deeper a founder's knowledge of debt financing, the higher the new firm's ability to obtain debt financing (conditional on the decision to raise debt financing).*

The moderating effect of a new firm's growth-oriented strategy

As indicated by Estrin et al. (2022), internationalization and innovation are the two most prominent growth-oriented strategies for new firms. These strategies rely heavily on knowledge generation and acquisition (Stephan *et al.*, 2019). Internationalization is a knowledge-intensive process as

firms need to gather (up-to-date) foreign market information, train and hire additional staff, adapt products to satisfy foreign customers, and establish new distribution networks (Paeleman *et al.*, 2017). These activities require new institutional knowledge, knowledge of specific foreign business activities, and experiential knowledge of (how to deal with) foreign competition (Sui and Baum, 2014). Similarly, new firms that innovate need to generate and acquire technology, customer, and market knowledge through reading publications, self-directed tutorials, scientific activities within the firm, and interactions with external partners such as potential customers or suppliers (Grimpe and Kaiser, 2010; Sullivan and Marvel, 2011). In addition, both internationalization and innovation entail high levels of uncertainty. New firms that internationalize face liabilities of foreignness (Patel *et al.*, 2018), which manifest itself as additional costs such as transaction, coordination, labor, and legal costs that emerge from unfamiliarity with the foreign environment (Almodóvar and Rugman, 2014). This increases the risk of failure (Zahra, 2005). Innovating new firms enter the market with new products or technologies and are surrounded with technical and market uncertainty (Anderson and Tushman, 1990), the outcome of their technological development activities is often uncertain (Behrens *et al.*, 2014), the business model is not fully established yet (Andries *et al.*, 2013), and new products may face customer resistance (Kleijnen *et al.*, 2009). As such, internationalization and innovation are knowledge-intensive, risky and uncertain strategies.

It can be argued that this knowledge-intensive and uncertain character of internationalization and innovation reinforces the importance of deep knowledge of debt financing for (a) identifying and selecting relevant debt financing sources and (b) for negotiating with and convincing debt providers.

We expect that founders' deeper understanding of the availability, costs, and benefits of specific debt financing sources is even more important when the new firm is extensively involved in internationalization and innovation activities. This knowledge depth will be crucial for founders of growth-oriented new firms to correctly assess the more complex criteria debt providers use. Founders with deeper knowledge of debt financing comprehend the decision-making process of finance providers, and thus understand how their business can become investment-ready (OECD, 2022). For instance, as exporting new firms establish new distribution networks (Paeleman *et al.*, 2017), they often locate their inventories and receivables abroad, with different legal systems and customs. This limits home-based debt providers' ability to use collateral to mitigate risk and reduces the value of these assets as signals of venture quality (Riding *et al.*, 2012). Founders of exporting new firms who want to obtain debt financing, need to know that it is important to have collateral located in the country where they apply for debt financing. If that is not possible, they should be knowledgeable about alternative quality characteristics that can serve as signals of the new firm's value (Riding *et al.*, 2012). In a similar vein, innovative new firms that want to obtain debt financing benefit from knowing that they need to protect their generated technology, customer, and market knowledge through the use of formal protection mechanism. Without such formal protection mechanisms, investors often refrain from investing in innovative new firms because of high levels of uncertainty (Audretsch *et al.*, 2012; De Rassenfosse and Fischer, 2016; Mina *et al.*, 2013) Furthermore, investments in innovation and internationalization are often staged. Innovation projects are often only continued and receive additional financing if they are able to reach a certain milestone (Andries and Hünermund, 2020). Similarly, internationalization activities are often developed using a step-wise approach with the option to abandon them

(Prashantham and Dhajaran, 2010). Founders with deeper financial knowledge anticipate future financial needs of the business (OECD, 2022). Since assessing which amounts of financing are desired and what types of financing would be most appropriate at each stage of the internationalization and innovation process is very difficult (Mazzucato, 2013), we can expect that deep knowledge of debt financing will play an even bigger role under these circumstances.

We also argued above that an entrepreneur's deep knowledge of debt financing allows him/her to negotiate with and convince debt providers more effectively, as it serves as a signal reducing information asymmetries and uncertainty surrounding the new firm. Relationships between debt providers and new firms engaging in growth-oriented strategies are characterized by even higher levels of information asymmetries (Landström, 2017). The entrepreneurial finance literature shows that liabilities of newness and foreignness inherent to internationalization pose great challenges for debt providers to estimate the additional risks related to internationalization and to assess whether the new firm has the competencies to manage activities abroad (De Maeseneire and Claeys, 2012; Riding *et al.*, 2012; St-Pierre *et al.*, 2018). Similarly, debt providers find it very challenging to assess the additional risks related to innovation (Brown *et al.*, 2009; Mina *et al*., 2013). The higher these information asymmetries, the more positive soft information – such as deep debt financing knowledge – can be expected to improve founders' and new firms' ability to convince debt providers. Thus,

> *Hypothesis 2a: The association between the depth of a founder's debt financing knowledge and the new firm's ability to obtain debt financing is more positive for new firms that internationalize more (conditional on the decision to raise debt financing).*

Hypothesis 2b: The association between the depth of a founder's debt financing knowledge and the new firm's ability to obtain debt financing is more positive for new firms that innovate more (conditional on the decision to raise debt financing).

METHODOLOGY

Data and sample

Our study is based on a pooled, cross-sectional dataset of new firms in Flanders, Belgium. We collected data on four cohorts of new firms, surveyed in 2017, 2018, 2019, and 2020. Information on new firms, their founders, and their financing sources was collected.[1] These new firms operated in low- and high-tech sectors, were independently owned, and up to three years old at the time of the survey. Investigating new firms' financial knowledge in their early stages is particularly relevant, as then the issue of information asymmetry is the most acute and financial decision-making rests heavily on the shoulders of new firm founders (as they are less experienced in requesting financing or do not possess enough financial resources to hire financial consultants). In 2017, we consulted 'Kruispuntbank van Ondernemingen', the official public database on Belgian firms from the Belgian Federal Authority. We identified a total population of 106,331 independent, low-and high-tech firms founded between 2014 and 2016. We drew a random sample of 4,964 new firms stratified according to age and industry (wave 1).[2] In 2018, 46,337 additional new firms

[1] Similar to the kfW/ZEW start-up panel (Vaznyte & Andries, 2019) and the Kaufmann firm survey (Robb and Robinson, 2014), our survey investigated new firms' financial decision-making. Our survey defined eleven different sources of external funding, namely (1) family and friends, (2) trade credit, (3) leasing, (4) short-term and long-term loans by financial institutions, (5) other financing by financial institutions, (6) government (e.g., capital grants, interest subsidies, loans, and guarantees), (7) business angels, (8) venture capital, (9) accelerators, incubators, and universities, (10) other outside companies (e.g., suppliers, customers, competitors, employer of (one of) the founder(s)), (11) crowdfunding (e.g., equity crowdfunding, loan based crowdfunding, donation based crowdfunding, reward based crowdfunding). New firms can attract multiple sources of external funding.

[2] In line with the kfW/ZEW start-up panel (see Vaznyte & Andries, 2019), we oversampled new firms active in medium and high-tech industries, such that we would have enough variation (i.e., enough innovative and export-oriented observations) in our dataset. In particular, we selected 5% of the new firms in low-technology industries and

that were up to one year old (=founded in 2017) were identified. From this population, we randomly selected a sample of 2,109 new firms, stratified by industry (wave 2). In 2019 and 2020, we repeated this procedure and identified 51,237 and 56,374 new firms that were one year old (=founded in 2018/2019), from which we drew a random sample of 2,360 and 2,511 new firms stratified by industry. As such, our total sample consisted of 11,944 contacted firms. More details on our sample construction and distribution (by wave and industry) are presented in Appendix A.

We followed a key-informant approach and addressed our survey directly to one of the founders. Each survey was online for 12 weeks. Founders received an email asking to fill out the online questionnaire. To increase the data quality, respondents were guaranteed confidentiality. After two email reminders, we conducted a telephone reminder call to remaining non-respondents.

A total of 3,983 new firms decided to participate (n_{wave1}=1,813, n_{wave2}=717, n_{wave3}=790, n_{wave4}=663). 575 new firms were discarded because their responses indicated that – as opposed to the official data – they did not match our sampling criteria with regard to firm age or independence. This resulted in a sample of 3,408 new firms. Using listwise deletion, several new firms were removed because of missing values, reducing our final dataset to a total of 1,845 new firms (full response rate=15.45%). Of these 1,845 new firms, 298 sought debt financing.

We examined non-response bias. As late respondents are considered similar to non-respondents (Armstrong and Overton, 1977), we compared early and late respondents. We did not find any significant differences. We also compared our final sample of 1,845 new firms with the initial sample of 11,944 new firms that we contacted. We found only minor differences ($p<0.05$).

25% of the new firms in the high-and medium-technology industries such that about 50% of the new firms in each sample operate in low-tech industries and 50% in high-and medium-tech industries. This sampling procedure was repeated each year.

Firms in high-tech industries are slightly overrepresented in our final sample (55.39%) compared to our initial sample (48.64%). The average firm age in our final sample is slightly older than the average firm age in the initial sample (1.44 years vs. 1.43 years).

Variables

Dependent variable

Following Cosh *et al.* (2009), we measured new firms' ability to obtain debt financing as the total amount of debt financing a new firm obtained in the reference year (i.e., the year before our survey was conducted) divided by the total amount of debt financing sought in that same year. The questionnaire defined four types of debt financing, namely (1) trade credit, (2) leasing, (3) short- and long-term loans by financial institutions, and (4) other financing by financial institutions (e.g., bank overdrafts, mixed credit lines). In particular, the respondent had to specify (a) the amount the new firm sought and (b) the amount it obtained for each of these financing types in the reference year. Pre-testing with a sample of 10 entrepreneurs indicated that respondents did not have any issues recalling these amounts. Selecting and obtaining debt financing is one of the most pressing challenges new firms face (Brinckmann *et al.*, 2011). In Flanders, the bank financing gap is substantial (Boata *et al.*, 2019). Given these difficulties, selecting and obtaining debt financing is a deliberate decision made by firm founders, and respondents are thus able to provide valid responses on this question. Similar to Cosh et al. (2009), we added up the obtained amounts of these four types of debt financing and divided this by the total amount of debt financing sought to construct the firm-level variable *debt financing ability.*

Independent variable

At the individual level, we measured the *depth* of a founder's debt financing knowledge. Following Maes *et al.* (2005) and Seghers *et al.* (2012), we asked respondents to assess their knowledge of each of the four debt financing alternatives mentioned above on a seven-point Likert scale (from 1–unaware of the existence of a particular debt finance alternative to 7–very extensive knowledge). The drawback of self-reported data is founders' tendency to overestimate their level of financial knowledge (Anderson *et al.*, 2017; Lusardi and Mitchell, 2014). If overestimation was an issue, the average founder should have indicated that he/she had above-average knowledge (i.e., a score of 4 or more), which was not the case (founder's average knowledge of debt financing alternatives is 3.30). Only 46.56% of the founders indicated that they were aware of the existence of respectively all four debt financing alternatives, which provides additional support that our responses do not suffer from this bias. To measure the *depth* of a founder's debt financing knowledge, we counted for how many debt financing alternatives (i.e., (1) – (4) from above) the founder reported to have extensive knowledge (i.e., a score of 7 on the seven-point Likert scale). This measure is consistent with work by Laursen and Salter (2006) and Terjesen and Patel (2017) who used a similar operationalization in another context (namely, depth of external knowledge search).

To measure the degree to which a new firm is following an *internationalization* strategy, we asked respondents to indicate the percentage of their new firm's customers that came from abroad in the reference year (Chowdhury and Audretsch, 2020). Having customers abroad has become a popular and among the most observed modes of entering foreign markets (Cavusgil and Knight, 2015). Further, the extent to which the new firm is following an *innovation* strategy was

measured as the number of full-time employees in R&D divided by the total number of full-time employees in the reference year (Andries and Czarnitzki, 2014; Schmid *et al.*, 2014).

Control variables

We included several control variables. At the individual level, founders' human and social capital can work as a signaling mechanism to overcome information asymmetries when securing external funding. We included the number of years of *work experience* in the reference year (Vaznyte and Andries, 2019). If more than one founder was included in new firm foundation, we used the average number of years of work experience of the founding team. Moreover, we controlled for *entrepreneurial experience* which equals 1 if at least one of the founders has started a new firm before, and 0 if not (Ko and McKelvie, 2018). Next, we included the variable *education*, which indicates the highest educational level of the founder(s). Responses were coded on a scale from 0 to 6 following the International Standard Classification of Education (Johansson *et al.*, 2016). Since teams may possess more human and social capital than solo founders (Hsu, 2007), we also controlled for the variable *founding team* which equals 1 if the new firm had a founding team at business foundation and 0 if not.

At the firm level, we controlled for age, size, and sales since these variables are associated with the amount of external finance obtained by the new firm (Cassar, 2004; Cosh *et al.*, 2009; Eckhardt *et al.*, 2006). We measured *firm age* as the number of years from business foundation until the reference year, *firm size* as the number of full-time equivalents (i.e., employees and founders) at business foundation, and *sales* as the annual sales revenues achieved in the reference year. *Sales* was validated with secondary data from the Bel-first database when available.[3] These

[3] Bel-first is a database by Bureau Van Dijk that contains financial information on more than 320,000 public and private Belgian firms.

data correlated strongly with those reported in the survey ($r=0.98$, $p<0.001$, $n=25$). Moreover, a firm's ability to obtain the requested amount of external funding relies on its asset tangibility or collateral. Firms that contain little tangible assets will face higher information asymmetries and more difficulties to obtain external financing (Mina *et al.*, 2013). We included the ratio of a firm's expenditure on capital investments to its total amount of financing desired in the reference year as a measure of the firm's level of asset *tangibility* (Vaznyte and Andries, 2019). Firms that use personal debt or equity financing are less likely to access debt financing (Cole and Sokolyk, 2018). Therefore, we included the amount of financing that was actually obtained from (a) the founders and top management team and (b) business angels and venture capitalists in the reference year as a measure of the firm's use of (a) *personal debt* and (b) *equity* financing. As opposed to legal persons, natural persons are personally liable for the debt in the event of bankruptcy or default. Therefore, we also included a dummy variable *legal form* equal to 1 if the firm is registered as a legal person, and 0 if registered as a natural person.

We log-transformed *work experience*, *firm age*, *firm size*, *sales, personal debt,* and *equity*. We included a dummy variable *medium-high tech* (equal to 1 if the new firm is active in medium and high-tech industry and 0 if not) and a categorical variable representing different survey *waves* (data from the first survey wave of 2017 was the base category) to account for any unobserved industry or year effects. Finally, the dummy variable *service* indicates whether the new firm is in a service industry or not. Appendix B presents the exact wording used in the questionnaire.

RESULTS

Descriptives

Table 1 presents the descriptive statistics of our variables. New firms obtain approximately 84% of their desired amount of debt financing. On average, firm founders know 0.698 (out of 4) debt financing alternatives in depth. About 8% of their customers come from abroad and 20% of their employees work on internal R&D. Appendix C presents descriptive statistics of and mean comparison tests between different samples. In Table C1, for instance, we find that founders who sought (vs. did not seek) debt financing have deeper knowledge of debt (0.698 vs. 0.270, $p<0.01$). In Table C2, we see that founders with above-average financial knowledge depth of debt financing (vs. below-average financial knowledge depth of debt financing) obtain a larger share of the desired amount of debt (90.4 vs. 80.9, $p<0.05$). We further find in Table C3 that founders who sought more than one (vs. one) type of debt financing have deeper knowledge of debt (1.030 vs. 0.603, $p<0.05$). Table 2 presents the correlation table. Debt financing ability is positively (although insignificantly) correlated with knowledge depth. Debt financing ability is negatively correlated with internationalization and innovation, which suggests that debt capital providers are less likely to provide debt financing to firms following internationalization and innovation strategies. Variance inflation factors range between 1.14 and 2.12, indicating that multicollinearity isn't an issue.

Since common method bias (CMB) can be a concern whenever a cross-sectional design with self-report measures is used, we applied several survey design techniques (Podsakoff *et al.*, 2003). We also applied a correlational marker technique (Lindell and Whitney, 2001), which indicates that CMB is not major threat in our study (more details in Appendix D).

<INSERT TABLE 1 AND 2>

Results

A new firm's financing is a two-stage selection process (Eckhardt *et al.*, 2006) in which the new firm's ability to obtain the desired amount of debt financing is conditional on its decision to seek for debt financing (Cosh *et al.*, 2009). In our sample of 1,845 new firms, only 298 new firms sought for debt financing (details on the debt application process in Appendix E). To control and test for possible selection bias, we use a Heckman FIML (Puhani, 2000). The FIML model uses maximum likelihood to jointly estimate the first stage equation, modeling the new firm's probability to seek debt financing (i.e., *external debt sought* measured as a dummy variable that equals 1 if the founder's new firm tried to obtain debt financing in the reference year and 0 if not), and the second stage equation, modeling the extent to which the founder's *knowledge depth* affects the new firm's *debt financing ability*. In line with Eckhardt et al. (2006), we used the dummy variable whether or not the new firm was active in a *service* sector as an exclusion restriction.[4]

The results of the Heckman FIML model are presented in Table 3. The results of the selection model (i.e., first stage) are presented in Model 1. Model 2 until Model 4 present the results of the regression model (i.e., second stage). In Model 2, we only include control variables. In Model 3, we add our independent variable. In Model 4, all interaction terms are added. Adding our independent/interaction variables to the analysis significantly improved the statistical power of the model (Wald chi square for the full model fit equals 99.913, $p < 0.01$).

<INSERT TABLE 3 >

In Model 3, the positive coefficient of the *depth* of a founder's debt financing knowledge indicates that founders who have a deeper understanding of debt financing have a higher ability to

[4] We could not use a regional indicator (i.e., NUTS-2 level) as an exclusion restriction (Cowling *et al.*, 2016), as this variable did not significantly influence selection into the first stage.

obtain their desired amount of debt financing (β=0.039, $p<0.01$), which provides support for Hypothesis 1. All things equal, knowing one more debt financing source in depth changes the new firm's *debt financing ability* by 3.90 percentage points. Model 3 further indicates that more growth-oriented new firms have more difficulties to obtain the desired amount of debt financing ($\beta_{internationalization}$= -0.003, $p<0.05$, $\beta_{innovation}$= -0.168, $p<0.01$).

In Model 4, the coefficient of the interaction term between the *depth* of a founder's debt financing knowledge and *internationalization* is significant and positive (β=0.001, $p<0.05$). In Table 4, we calculate marginal effects at different representative values of *internationalization*. We indeed see that the relationship between the *depth* of a founder's debt financing knowledge and the new firm's ability to obtain debt financing becomes more pronounced when the new firm internationalizes more. For instance, if none of the new firm's customers come from abroad, going for one debt financing source from superficial to deep knowledge, increases ceteris paribus the new firm's *debt financing ability* by 2.80 percentage points. However, if the new firm internationalizes more and if, for example, 40% of its customers come from abroad, then going for one debt financing source from superficial to deep knowledge, increases the new firm's *debt financing ability* by 7.60 percentage points. Figure 1a presents the interaction plot and shows that the positive relationship between the *depth* of a founder's debt financing knowledge and the new firm's *debt financing ability* is indeed more pronounced (i.e., steeper) when the new firm internationalizes more. We graphically checked this interaction further by calculating the average marginal effect of *knowledge depth* on *debt financing ability* across a range of representative values for *internationalization* in Figure 1b (including a 90% confidence interval (CI)). Figure 1b shows that the relationship between the *depth* of a founder's debt financing knowledge and the new firm's

debt financing ability is significant – as the CI band does not contain the value of 0 for all these values – and positive for all values of *internationalization* and this positive relationship is stronger for higher levels of *internationalization*. Overall, these findings support Hypothesis 2a.

In Model 4, the coefficient of the interaction term between the *depth* of a founder's debt financing knowledge and *innovation* is positive but not significant (β=0.007, p>0.1). Figure 2a and 2b present the interaction and average marginal effect plot and show that the relationship between the *depth* of a founder's debt financing knowledge and the new firm's *debt financing ability* does not depend on the new firm's level of *innovation*. Hypothesis 2b is thus not supported.

<INSERT TABLE 4 & FIGURE 1A/1B – 2A/2B >

We addressed endogeneity concerns and conducted a battery of robustness tests, including alternative measures and stricter sample restrictions. These tests are described in Appendix F.

DISCUSSION

This study contributes to the entrepreneurial finance literature, and more specifically, the debate around the availability and accessibility of external debt to new firms (e.g., Cowling and Sclip, 2022; Cosh *et al.*, 2009). While previous work provides insights on the relationship between financial knowledge and entrepreneurs' *attitudes* towards and *perceptions* of external financing sources (Van Auken, 2001; Koropp *et al.*, 2013), this study is, as far as we know, the first to theorize about and measure the impact of financial knowledge on new firms' *actual ability to obtain* external finance. This is important, as it is the actual financing obtained (and not just attitudes towards and perceptions of financing sources), that allows new firms to successfully launch and grow (Van Auken, 2001). Further, while prior work has largely focused on the role of firm characteristics for firms' ability to fulfill their financing needs (e.g., Cole and Sokolyk, 2018;

Cowling *et al.*, 2012), our study points to the role of founder characteristics, and in particular to founders' financial knowledge. Our findings also have implications for scholars investigating the role of similarities between entrepreneurs and financial resource providers. Scholars have shown that debt providers such as bank officers (Bruns *et al.*, 2008) and private equity providers such as venture capitalists (Franke *et al.*, 2006) are more inclined to provide funding to entrepreneurs who possess a similar experience or educational background. Our study shows that a shared, deep knowledge of the same financing sources is also important.

This study also demonstrates that deep knowledge is not equally important for all new firms. It reveals the contingency effect of the new firm's strategic choices, by showing that knowledge depth is more important for new firms that internationalize more. This is because internationalization is a knowledge-intensive and risky strategy, for which debt financing can only be obtained if founders have rich and complex knowledge of the availability, criteria, and conditions of debt financing mechanisms. Contrary to our expectations, we do not observe a positive moderating effect of innovation on the relationship between the depth of debt financing knowledge and the ability to obtain the desired amount of debt financing. Scholars have pointed out that a narrow focus on R&D activities or R&D intensity is not optimal for capturing innovation and that other, broader measures are preferable (Estrin *et al.*, 2022). It would be good if future studies could replicate our tests using such broader measures of innovation using accounting (Garcia Martinez *et al.*, 2019) or patent data (Mazouz and Zhao, 2019).

Through its focus on new firm founders, this study also contributes to the literature on financial literacy in general. Surprisingly, the topic of financial literacy is largely examined in the context of households and personal finance (Calcagno *et al.*, 2019), but remains underexplored in

the contexts of small firms (Graña-Alvarez *et al.*, 2022). We show that financial knowledge, and in particular *deep* financial knowledge, is also highly relevant in the context of growth-oriented new firms. Our findings suggest that studies on the impact of financial literacy (in the context of households and personal finance) should pay attention to contingencies, such as the context or lifestyle of individuals and households.

Moreover, we also contribute to cognitive psychology literature. Prior research in cognitive psychology has shown that an individual's knowledge (structure) affects decision-making on experimental tasks in areas such as chess (Gobet and Simon, 1996) or medical diagnosis (Norman *et al.*, 1994). Like most experimental research, these studies may be limited in their generalizability. For this reason, prior work has called to use samples of real world decision-makers across more 'naturalistic' contexts – particularly as it applies to studying organizational decision making (Dane *et al.*, 2012). Responding to this call, scholars started to provide insights on the role of a firm's human capital/cognitive resources (i.e., the prior experience and knowledge of founders) for selecting new venture ideas (Wood and Williams, 2014). However, to grow a new firm, founders need to make additional organizational decisions such as financing decisions (Davidsson and Honig, 2003). Extending the cognitive perspective, our findings provide evidence that a founder's deep knowledge (of financing) is also an important cognitive resource for making organizational decisions. It further illustrates that the importance of deep knowledge for (organizational) decision-making also relates to the knowledge-intensity of the (organizational) decision context.

By looking at the moderating effects of new firms' growth-oriented strategies, our study also responds to the repeated plea in the literature to incorporate decision-makers' cognitive

processes into theoretical models of internationalization (Prashantham and Floyd, 2019; Schwens *et al*., 2018; Verbeke and Ciravegna, 2018) and innovation (Dahlander *et al.,* 2016; Srivastava *et al.*, 2020). A limited number of studies on the internationalization and innovation activities of small, new enterprises (Prashantham and Floyd, 2019) have paid attention to the role of managers' and entrepreneurs' cognitions – such as their industry experience or risk perception – to identify and exploit international and innovative business opportunities (e.g., Di Gregorio, 2005). Our study adds to these insights by focusing on the role of decision-makers' knowledge of external financing for exploiting international and innovative opportunities. By finding a moderating effect of new firms' engagement in internationalization, it embraces the view that institutional relationships, such as those between new firms and external debt providers, and the resources that stem from these relationships, form the basis for the successful exploitation of new international opportunities (Johanson and Vahlne, 2009). Our results show that the positive effect of the depth of founders' debt financing knowledge on new firms' ability to raise the desired amount of debt financing is more pronounced for new firms that internationalize. Our work suggests that future studies examining the internationalization activities of new firms should consider incorporating not only the cognitions of founders or managers regarding the identification of international business opportunities but also their cognitions regarding the mobilization of resources to exploit these opportunities.

Limitations and future research directions

This study has several limitations. First, given our small sample size, we could not provide detailed analyses of the effect of in-depth knowledge of debt financing on the new firm's ability to obtain the desired amounts of specific financing types. For instance, trade credit can be an extremely

expensive financing form (Andrieu *et al.*, 2018). It could be that an in-depth knowledge of trade credit actually reduces the willingness of founders to take on trade credit, because they understand the true cost of trade credit. Further, not all debt financing types are equally difficult to access (e.g., Chigurupati and Hegde, 2010; Ferrando and Mulier, 2013; Slotty, 2009) and the importance of deep knowledge of debt financing could depend on the debt financing type sought. Also, future studies could investigate whether in-depth financial knowledge of a specific debt finance alternative impacts the degree to which other debt financing instruments are sought and/or obtained (Cumming and Johan, 2017) as different debt products entail different bank-firm information exchanges (Cowling and Sclip, 2022).

Second, although debt is one of the prevalent financing sources at the early stages (Robb and Robinson, 2014), equity financing is often needed too. As very few new firms in our dataset sought equity financing, we were unable to extend our analyses to this financing source. Future studies could focus on how financial knowledge influences the acquisition of different sources of equity financing.

A third limitation relates to temporal concerns. From our Heckman model, we conclude that firm founders' financial knowledge is an important first step in deciding whether or not to apply for external funding, and – once this decision has been taken – an important determinant of their ability to acquire the requested financial amount. Although we control for potential endogeneity and survivorship concerns, we encourage scholars to employ longitudinal datasets, panel data methods or a randomized controlled trial.

Although our focus on one region (i.e., Flanders) lowers unobserved heterogeneity among new firms resulting from changes in environmental conditions, it calls into question whether our

results would hold in other geographies. Future research can extend our findings by examining the effect of financial knowledge on access to debt fundraising across additional geographies, such as developing economies (Abubakar, 2015), where financial knowledge may vary more significantly.

Moreover, we rely on respondents' own assessments of their financial knowledge. Prior work on financial literacy in the context of personal finance has shown that individuals tend to overestimate their actual levels of financial knowledge (Lusardi and Mitchell, 2014), and that this perceived financial knowledge is at as least as important for financial decision-making as actual financial knowledge in the context of personal finance (Anderson *et al.*, 2017). Our descriptives provide no indication of entrepreneurs overestimating their knowledge of debt financing. Nevertheless, future research could replicate our study using both subjective and objective assessments of entrepreneurs' debt financing knowledge and disentangle their effects.

Finally, we encourage future studies to investigate the impact of fintech on entrepreneurs' financial knowledge and access to finance. Fintech brings novel information technologies and innovative methods to the market, which provides new opportunities for firms to access finance (Bollaert *et al.*, 2021; Cumming *et al.*, 2021). However, there is also a risk that fintech may exacerbate the funding gap for entrepreneurs with low financial knowledge. Innovations in financial products or services may require even greater financial knowledge, which may impede access to finance for individuals with low levels of financial knowledge. Moreover, fintech could strip entrepreneurs of formal and informal support from lenders/investors. The increased use of lending algorithms can curtail personal contact with lenders/investors, restricting opportunities for business advice and mentoring (OECD, 2022). Entrepreneurs with lower levels of financial knowledge rely heavily on these types of support. This implies that their financial learning (and

access to finance) may be significantly affected by fintech innovations (Malmström and Wincent, 2018). Hence, there is a risk that fintech reinforces the financial exclusion of founders who lack financial knowledge. Another important question then becomes how policy makers could harness the potential of fintech for entrepreneurship/overcome financial exclusion. Future research may investigate how policy makers could foster financial learning (e.g., by providing entrepreneurship training programs that raise awareness about fintech options) for entrepreneurs.

Practical implications

Although policymakers are investing heavily in various financial aid programs for closing the funding gap, access to external funds still remains one of the greatest issues faced by small, entrepreneurial ventures (OECD, 2020). Our findings suggest that a funding gap does not only stem from supply-side constraints, but also from demand-side constraints. A founder's insufficiently deep knowledge is an impediment to the successful acquisition of external debt. This inappropriate knowledge may be particularly severe for international new firms, which due to a liability of newness and foreignness face even greater hurdles in accessing debt. Entrepreneurs rarely seek for financial advice and make most of the financial decisions themselves (Lentz *et al.*, 2016). Deepening entrepreneurs' own financial knowledge will be an important first step in addressing the funding gap. To address this, universities could expand their offerings by introducing additional entrepreneurial finance courses, while the government could play a role in supporting educational programs tailored to entrepreneurs without a finance background. While this advice may seem obvious, our study clearly shows that these programs should take great care to discuss financing sources in-depth (e.g., discussing the external funders that provide them, the criteria they use, the documents they will require, the way they can be contacted) instead of merely

touching upon them. In the wake of the fintech era, policy makers could also develop online platforms that deliver financial training (OECD, 2022). For entrepreneurs, our study implies that having a detailed knowledge of financing alternatives is pivotal for debt acquisition success, especially when pursuing a growth-oriented strategy. When starting a firm, founders often possess limited knowledge of business activities, and in particular of entrepreneurial financing (Brinckmann *et al.*, 2011). We show that having limited, superficial knowledge hinders the financial decision-making capability of entrepreneurs that internationalize early on. Instead, deep, detailed knowledge is crucial to build sustainable business strategies.

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Table 1. Descriptive statistics ($N_{second\ stage}$=298)

	25th percentile	Mean	Median	75th percentile	SD	Min	Max
Debt fin. ability	0.000	0.839	1.000	1.000	0.340	0.000	1.000
Knowledge depth	0.000	0.698	0.000	1.000	1.237	0.000	4.000
Internationalization	0.000	8.010	0.000	3.000	20.437	0.000	100.000
Innovation	0.000	0.199	0.000	0.200	0.364	0.000	1.000
Work experience[a]	7.000	14.338	13.333	20.000	8.995	0.000	45.000
Entr. exp.	0.000	0.483	0.000	1.000	0.501	0.000	1.000
Education	3.000	3.879	4.000	5.000	1.200	0.000	6.000
Founding team	0.000	0.265	0.000	1.000	0.442	0.000	1.000
Firm age[a]	1.000	1.302	1.000	3.000	0.611	1.000	3.000
Firm size[a]	1.000	2.127	1.000	2.000	2.655	0.150	20.000
Sales[a,b]	16.500	145.991	60.000	125.000	322.392	0.000	2,800.000
Tangibility	0.000	0.520	0.538	0.789	0.323	0.000	1.000
Personal debt[a,b]	0.000	21.365	0.000	10.000	91.306	0.000	1,000.000
Equity[a,b]	0.000	6.409	0.000	0.000	58.971	0.000	650.000
Legal form	0.000	0.651	1.000	1.000	0.477	0.000	1.000
Medium-high tech	0.000	0.517	1.000	1.000	0.501	0.000	1.000
Wave 1	0.000	0.332	0.000	1.000	0.471	0.000	1.000
Wave 2	0.000	0.262	0.000	1.000	0.440	0.000	1.000
Wave 3	0.000	0.185	0.000	0.000	0.389	0.000	1.000
Wave 4	0.000	0.221	0.000	0.000	0.416	0.000	1.000

Notes: All variables are defined and measured as in Table A4 in Appendix.
[a] The actual value was used for the descriptive statistics.
[b] In thousands of Euros

Table 2. Correlation table ($N_{second\ stage}$=298)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Debt fin. ability	1																			
2	Knowledge depth	0.105	1																		
3	Internationalization	-0.212*	0.061	1																	
4	Innovation	-0.265*	0.001	0.144*	1																
5	Work experience[c]	-0.035	0.160*	0.052	-0.070	1															
6	Entr. exp.[b]	-0.043	0.095	0.194*	0.090	-0.169*	1														
7	Education	0.048	0.080	0.072	-0.010	-0.002	0.070	1													
8	Founding team[b]	0.019	0.122*	0.133*	0.116*	0.006	0.393*	0.245*	1												
9	Firm age[c]	-0.272*	0.126*	0.081	0.117*	0.003	0.149*	0.119*	0.126*	1											
10	Firm size[c]	0.062	0.123*	0.130*	0.025	0.069	0.333*	0.099	0.490*	0.094	1										
11	Sales[c,d]	0.192*	0.037	-0.104	-0.126*	0.005	0.065	0.010	0.068	0.142*	0.165*	1									
12	Tangibility	0.051	0.058	0.049	0.094	-0.152*	-0.044	-0.095	-0.048	-0.082	-0.064	-0.187*	1								
13	Personal debt[c,d]	0.013	-0.016	0.042	0.099	0.044	0.159*	0.015	0.156*	-0.200*	0.072	-0.063	-0.072	1							
14	Equity[c,d]	-0.120*	-0.016	0.042	0.099	0.044	0.159*	0.015	0.172*	0.061	0.201*	-0.115	0.082	0.146*	1						
15	Legal form	0.058	0.083	0.076	-0.010	0.148*	0.314*	0.296*	0.392*	0.109	0.342*	0.141*	-0.168*	0.120*	0.054	1					
16	Medium-high tech[b]	-0.076	-0.057	0.036	0.169*	-0.163*	0.008	0.233*	0.064	0.027	-0.046	0.102	-0.151*	0.044	0.069	0.095	1				
17	Wave 1[b]	-0.238*	0.144*	0.043	0.072	-0.021	0.074	0.059	0.012	0.620*	0.099	0.108	-0.088	-0.329*	0.071	0.068	-0.031	1			
18	Wave 2[b]	0.177*	-0.034	-0.079	-0.075	-0.011	-0.072	0.022	0.040	-0.270*	-0.064	-0.066	0.025	0.091	-0.077	-0.045	-0.020	-0.420*	1		
19	Wave 3[b]	0.053	0.053	-0.018	0.015	0.080	-0.062	-0.017	-0.090	-0.193*	-0.115*	-0.080	0.067	0.228*	0.009	0.069	0.010	-0.336*	-0.283*	1	
20	Wave 4[b]	0.034	-0.177*	0.051	-0.017	-0.040	0.050	-0.074	0.028	-0.238*	0.063	0.022	0.010	0.064	-0.007	0.035	0.047	-0.376*	-0.318*	-0.254*	1

Notes: Significance level: * p<0.05; All variables are defined and measured as in Table A4 in Appendix..

[b] The pairwise correlation of binary variables should be interpreted with care.

[c] The log-transformed variable was used in the pairwise correlations due to variable skewness.

[d] In thousands of Euros

Table 3. Heckman model: regression results of knowledge depth of debt financing, internationalization, and innovation on new firm's ability to obtain debt financing

	First stage	***Second stage***		
	External debt sought	Debt fin. ability	Debt fin. ability	Debt fin. ability
	(1)	(2)	(3)	(4)
Control variables				
Work experience	0.064**	0.018	0.012	0.011
	(0.029)	(0.021)	(0.021)	(0.021)
Entr. Exp.	0.230***	0.005	0.001	0.001
	(0.088)	(0.037)	(0.037)	(0.037)
Education	-0.097***	0.023	0.021	0.020
	(0.034)	(0.017)	(0.017)	(0.017)
Founding team	-0.125	0.017	0.010	0.006
	(0.123)	(0.049)	(0.049)	(0.048)
Firm age	-0.040	-0.323**	-0.325**	-0.324**
	(0.212)	(0.127)	(0.127)	(0.126)
Firm size	0.250***	0.049*	0.042	0.038
	(0.081)	(0.026)	(0.026)	(0.025)
Sales	0.050***	0.022***	0.021***	0.020***
	(0.016)	(0.006)	(0.006)	(0.006)
Tangibility	0.573***	0.125**	0.106**	0.107**
	(0.124)	(0.054)	(0.054)	(0.053)
Personal debt	0.000	-0.002	-0.002	-0.003
	(0.012)	(0.004)	(0.004)	(0.004)
Equity	0.059	-0.014*	-0.014*	-0.013*
	(0.038)	(0.008)	(0.007)	(0.007)
Legal form	0.492***	0.045	0.040	0.046
	(0.105)	(0.047)	(0.046)	(0.046)
Medium-high tech	-0.073	-0.036	-0.033	-0.038
	(0.079)	(0.037)	(0.036)	(0.036)
Wave dummies	Included	Included	Included	Included
Independent variables				
Knowledge depth	0.195***		0.039***	0.026*
	(0.036)		(0.013)	(0.015)
Knowledge depth * Internationalization				0.001**
				(0.001)
Knowledge depth * Innovation				0.007
				(0.039)
Internationalization	-0.001	-0.003**	-0.003**	-0.004***
	(0.002)	(0.001)	(0.001)	(0.001)
Innovation	-0.068	-0.171***	-0.168***	-0.173**
	(0.102)	(0.061)	(0.060)	(0.069)
Constant	-2.432***	0.564***	0.600***	0.629***
	(0.339)	(0.164)	(0.160)	(0.157)
Service	0.266***			
	(0.101)			
Mills ratio (lambda)		0.053	0.041	0.041
		(0.026)	(0.026)	(0.024)
N	1,845	298	298	298
Model fit (χ^2)		90.191***	91.444***	99.913***
Wald test (χ^2)		4.65**	2.70	3.17*

Notes: All variables are defined and measured as in Table A4 in Appendix. Robust two-tailed (i.e., conservative) standard errors are in the parentheses. Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table 4. Average marginal effect (AME) of knowledge depth of debt financing at different representative values of Internationalization and Innovation (in %)

Internationalization	**AME**	**Std. Err.**	**P-value**
0	0.028	0.014	0.052
20	0.052	0.014	0.000
40	0.076	0.021	0.000
60	0.100	0.030	0.001
80	0.124	0.041	0.002
100	0.149	0.051	0.004
Innovation	**AME**	**Std. Err.**	**P-value**
0	0.036	0.014	0.009
20	0.038	0.013	0.004
40	0.039	0.016	0.016
60	0.041	0.022	0.063
80	0.042	0.028	0.139
100	0.043	0.035	0.221

Figure 1a. Interaction of Knowledge Depth (between 0 and +1SD) and Internationalization (between 0 and +1SD) on Debt Financing (with 90% CI)

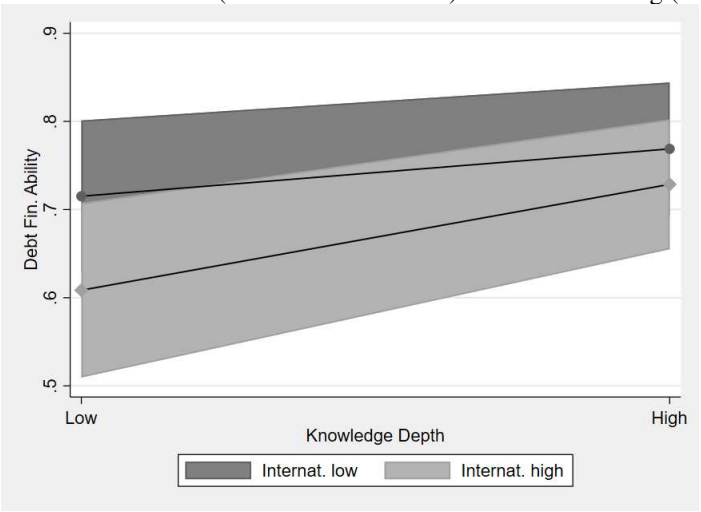


Figure 1b. Average Marginal Effect of Knowledge Depth on Debt Financing across level of Internationalization (between 0 and 100) (with 90% CI)

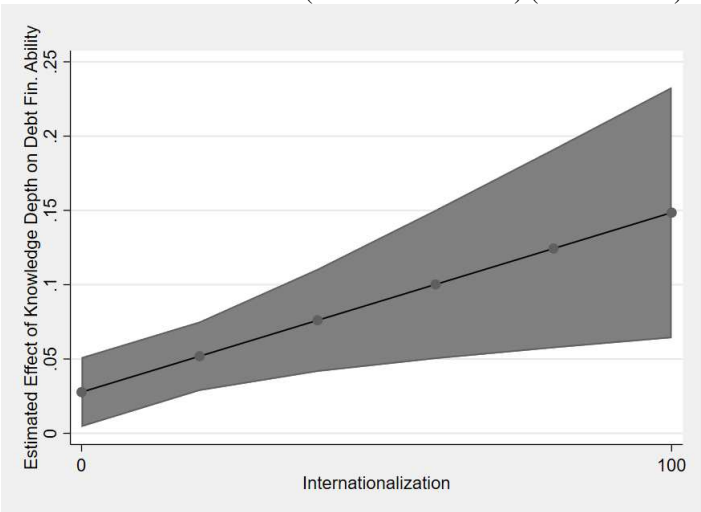


Figure 2a. Interaction of Knowledge Depth (between 0 and +1SD) and Innovation (between 0 and +1SD) on Debt Financing (with 90% CI)

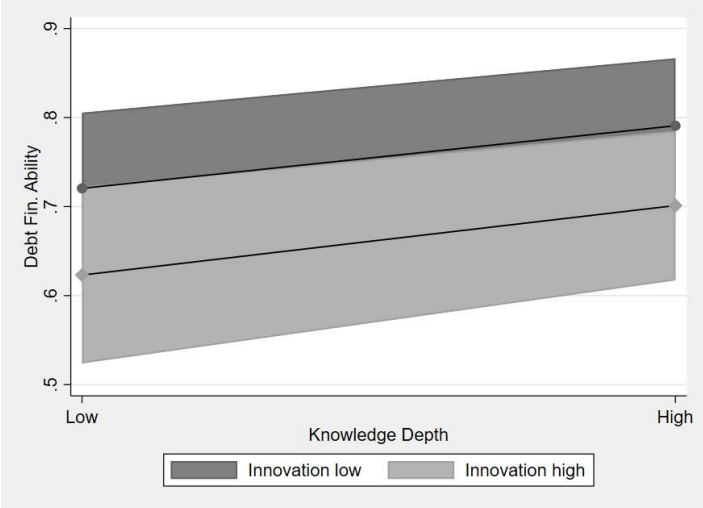
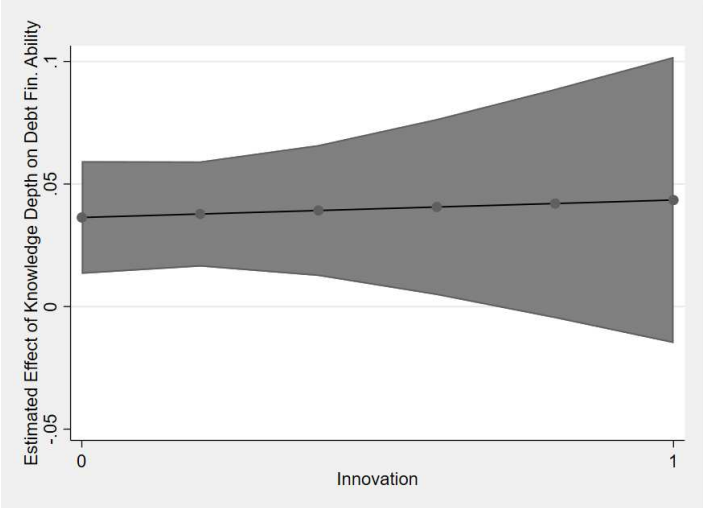


Figure 2b. Average Marginal Effect of Knowledge Depth on Debt Financing across level of Innovation (between 0 and 1) (with 90% CI)



APPENDIX A

TABLE A1. Sample construction

	Population criteria	Population	Initial sample (=invites)	Responses	Valid responses	Final sample (after removing missings)
Wave 1 (2017)	Founded between 2014 -2016: 0 – 3 years old Active in low, medium and high-technology sectors (see Table A2 in Appendix A)	106,331	4,964	1,813	1,504	887
Wave 2 (2018)	Founded in 2017: up 1 year old Active in low, medium and high-technology sectors (see Table A2 in Appendix A)	46,337	2,109	717	620	319
Wave 3 (2019)	Founded in 2018: up to 1 year old Active in low, medium and high-technology sectors (see Table A2 in Appendix A)	51,237	2,360	790	674	343
Wave 4 (2020)	Founded in 2019: up to 1 year old Active in low, medium and high-technology sectors (see Table A2 in Appendix A)	56,374	2,511	663	610	296
Total	Firms up to 3 years old Active in low, medium and high-technology sectors (see Table A2 in Appendix A)	**260,279**	**11,944**	**3,983**	**3,408**	**1,845**

TABLE A2. Composition of industry sectors

Sector	NACE Rev. 2
Medium and high-technology industries	
Cutting-edge technology manufacturing	20.20, 21.10, 21,20, 25.40, 26.11, 26.20, 26.30, 26.51, 26.60, 26.70, 29.31, 30.30, 30.40
High-technology manufacturing	20.13, 20.14, 20.52, 20.53, 20.59, 22.11, 22.19, 23.19, 26.12, 26.40, 27.11, 27.20, 27.40, 27.51, 27.90, 28.11–13, 28.15, 28.23, 28.24, 28.29, 28.30, 28.41, 28.49, 28.93–95, 28.99, 29.10, 29.32, 30.20, 32.50
Technology-intensive services	61.1–3, 62 (except 62.01), 63.1, 71.1–2, 72.1
Software	62.01
Low-technology industries	
Non-high-tech manufacturing	10–33 (excluding cutting-edge and high-tech manufacturing)
Skill-intensive services (non-technical, consulting services)	69.1–2, 70.2, 72.2, 73.1–2
Other business-orientated services	49.2, 49.5, 50.2, 50.4, 51.2, 52, 53, 61.9, 63.9, 64, 74.1, 74.3, 74.9, 77.1, 77.3–4, 78, 80–82
Consumer-orientated services	49.1, 49.3–4, 50.1, 50.3, 51.1, 55, 56, 58– 60, 65–66, 68, 74.2, 77.2, 79, 85.5-6, 90– 93, 95–96
Construction	41–43
Wholesale and retail trade	45–47

TABLE A3. Sample distribution by wave and industry

Population (N=260,279)			Initial sample (N=11,944)			Final sample (N=1,845)			Final sample (N=298)		
Sector	**N**	**%**	**Sector**	**N**	**%**	**Sector**	**N**	**%**	**Sector**	**N**	**%**
High-and medium-tech	**23,144**	**8.892**	***High-and medium-tech***	**5,809**	**48.635**	***High-and medium-tech***	**1,022**	**55.393**	***High-and medium-tech***	**154**	**51.678**
Cutting-edge technology manufacturing			Cutting-edge technology manufacturing			Cutting-edge technology manufacturing			Cutting-edge technology manufacturing		
Wave 1	98	0.038	Wave 1	27	0.226	Wave 1	3	0.163	Wave 1	0	0.000
Wave 2	34	0.013	Wave 2	9	0.075	Wave 2	2	0.108	Wave 2	1	0.336
Wave 3	41	0.016	Wave 3	11	0.092	Wave 3	0	0.000	Wave 3	0	0.000
Wave 4	46	0.018	Wave 4	13	0.109	Wave 4	1	0.054	Wave 4	1	0.336
Total	219	0.084	Total	60	0.502	Total	6	0.325	Total	2	0.671
High-technology manufacturing			High-technology manufacturing			High-technology manufacturing			High-technology manufacturing		
Wave 1	225	0.086	Wave 1	59	0.494	Wave 1	12	0.650	Wave 1	2	0.671
Wave 2	98	0.038	Wave 2	26	0.218	Wave 2	6	0.325	Wave 2	1	0.336
Wave 3	128	0.049	Wave 3	33	0.276	Wave 3	8	0.434	Wave 3	2	0.671
Wave 4	122	0.047	Wave 4	31	0.260	Wave 4	2	0.108	Wave 4	1	0.336
Total	573	0.220	Total	149	1.247	Total	28	1.518	Total	6	2.014
Technology-intensive services			Technology-intensive services			Technology-intensive services			Technology-intensive services		
Wave 1	8,012	3.078	Wave 1	2,005	16.787	Wave 1	403	21.843	Wave 1	44	14.765
Wave 2	3,453	1.327	Wave 2	865	7.242	Wave 2	138	7.480	Wave 2	33	11.074
Wave 3	3,734	1.435	Wave 3	935	7.828	Wave 3	157	8.509	Wave 3	24	8.054
Wave 4	3,783	1.453	Wave 4	946	7.920	Wave 4	127	6.883	Wave 4	33	11.074
Total	18,982	7.293	Total	4,751	39.777	Total	825	44.715	Total	134	44.966
Software			Software			Software			Software		
Wave 1	1,395	0.536	Wave 1	352	2.947	Wave 1	78	4.228	Wave 1	3	1.007
Wave 2	472	0.181	Wave 2	119	0.996	Wave 2	26	1.409	Wave 2	4	1.342
Wave 3	713	0.274	Wave 3	179	1.499	Wave 3	28	1.518	Wave 3	3	1.007
Wave 4	790	0.304	Wave 4	199	1.666	Wave 4	31	1.680	Wave 4	2	0.671
Total	3,37	1.295	Total	849	7.108	Total	163	8.835	Total	12	4.027
Low-tech	**237,135**	**91.108**	***Low-tech***	**6,135**	**51.365**	***Low-tech***	**823**	**44.607**	***Low-tech***	**144**	**48.322**
Non-high-tech manufacturing			Non-high-tech manufacturing			Non-high-tech manufacturing			Non-high-tech manufacturing		
Wave 1	5,393	2.072	Wave 1	143	1.197	Wave 1	23	1.247	Wave 1	1	0.336
Wave 2	2,019	0.776	Wave 2	52	0.435	Wave 2	7	0.379	Wave 2	0	0.000
Wave 3	2,672	1.027	Wave 3	69	0.578	Wave 3	8	0.434	Wave 3	2	0.671
Wave 4	3,013	1.158	Wave 4	77	0.645	Wave 4	13	7.046	Wave 4	2	0.671
Total	13,097	5.032	Total	341	2.855	Total	51	2.764	Total	5	1.678

Skill-intensive services (non-technical, consulting services)			Skill-intensive services (non-technical, consulting services)			Skill-intensive services (non-technical, consulting services)			Skill-intensive services (non-technical, consulting services)		
Wave 1	12,615	4.847	Wave 1	324	2.713	Wave 1	73	3.957	Wave 1	4	1.342
Wave 2	4,945	1.900	Wave 2	127	1.063	Wave 2	20	1.084	Wave 2	7	2.349
Wave 3	5,736	2.204	Wave 3	145	1.214	Wave 3	23	1.247	Wave 3	3	1.007
Wave 4	5,937	2.281	Wave 4	151	1.264	Wave 4	16	0.867	Wave 4	5	1.678
Total	29,233	11.231	Total	747	6.254	Total	132	7.154	Total	19	6.376
Other business-orientated service			Other business-orientated service			Other business-orientated service			Other business-orientated service		
Wave 1	15,79	6.067	Wave 1	402	3.366	Wave 1	66	3.577	Wave 1	11	3.691
Wave 2	7,609	2.923	Wave 2	193	1.616	Wave 2	31	1.680	Wave 2	5	1.678
Wave 3	7,897	3.034	Wave 3	200	1.674	Wave 3	26	1.409	Wave 3	4	1.342
Wave 4	8,188	3.146	Wave 4	208	1.741	Wave 4	20	1.084	Wave 4	3	1.007
Total	39,484	15.170	Total	1,003	8.398	Total	143	7.751	Total	23	7.718
Consumer-orientated services			Consumer-orientated services			Consumer-orientated services			Consumer-orientated services		
Wave 1	32,783	12.595	Wave 1	825	6.907	Wave 1	114	6.179	Wave 1	18	6.040
Wave 2	15,029	5.774	Wave 2	379	3.173	Wave 2	53	2.873	Wave 2	12	4.027
Wave 3	16,326	6.272	Wave 3	411	3.441	Wave 3	50	2.710	Wave 3	6	2.013
Wave 4	17,283	6.640	Wave 4	435	3.642	Wave 4	47	2.547	Wave 4	7	2.349
Total	81,421	31.282	Total	2,05	17.163	Total	264	14.309	Total	43	14.430
Construction			Construction			Construction			Construction		
Wave 1	14,058	5.401	Wave 1	358	2.997	Wave 1	55	2.981	Wave 1	6	2.013
Wave 2	5,436	2.089	Wave 2	138	1.155	Wave 2	19	1.030	Wave 2	10	3.356
Wave 3	6,828	2.623	Wave 3	173	1.448	Wave 3	18	0.976	Wave 3	10	3.356
Wave 4	9,563	3.674	Wave 4	241	2.018	Wave 4	17	0.921	Wave 4	5	1.678
Total	35,885	13.787	Total	910	7.629	Total	109	5.908	Total	31	10.403
Wholesale and retail trade			Wholesale and retail trade			Wholesale and retail trade			Wholesale and retail trade		
Wave 1	15,962	6.133	Wave 1	469	3.937	Wave 1	60	3.252	Wave 1	10	3.356
Wave 2	7,242	2.782	Wave 2	201	1.683	Wave 2	17	0.921	Wave 2	5	1.678
Wave 3	7,162	2.752	Wave 3	204	1.708	Wave 3	25	1.355	Wave 3	1	0.336
Wave 4	7,649	2.939	Wave 4	210	1.758	Wave 4	22	1.192	Wave 4	7	2.349
Total	38,015	14.605	Total	1084	9.076	Total	124	6.721	Total	23	7.718
Total	**260,279**	**100.000**	**Total**	**11,944**	**11,944**	**Total**	**1,845**	**100.00**	**Total**	**298**	**100.00**

APPENDIX B. Exact wording used in the questionnaire

Variable name	**Definition**	**Operationalization in the survey**
Dependent variables		
External debt sought	A dummy variable equal to one if the firm tried to obtain external debt financing (i.e., trade credit, leasing, short- and long-term loans, or other financing by financial institutions) and zero otherwise.	Which of the following forms of external financing did your firm try to attract in 20XX? [Answers: no, yes] − Trade credit − Leasing − Short- and long-term loans by financial institutions − Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines)
Debt financing ability	The percentage of the amount of debt financing (i.e., trade credit, leasing, short-and long-term loans, other financing) obtained by the firm (as a fraction of the amount of debt financing sought)	− [Amount of debt financing obtained]: What is the amount of financing (in €) that your firm has actually obtained in 20XX from: a) Trade credit b) Leasing c) Short- and long-term loans by financial institutions d) Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines) − [Amount of debt financing sought]: What is the amount of financing (in €) that your firm has tried to obtain in 20XX from: a) Trade credit b) Leasing c) Short- and long-term loans by financial institutions d) Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines)
Independent variables		
Financial knowledge depth of debt financing	Number of debt financing alternatives of which the founder has extensive knowledge (i.e., has indicated a score of 7).	To what extent are you aware of the following forms of external financing? [Answers: 7-point Likert scale (1 = not at all to 7 = to a large extent)] − Trade credit − Leasing − Short- and long-term loans by financial institutions

		– Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines)
Internationalization	The percentage of the firm's customers that came from abroad	What percentage of your customers came from abroad by the end of the year 20XX?
Innovation	The proportion of the firm's employees working on internal R&D	– How many employees (in FTE), including the founders, worked on internal R&D in the first year after incorporation? – How many employees (in FTE), including the founders, worked for the firm in the first year after incorporation?
Control variables		
Individual-level control variables		
Work experience	The natural logarithm of the (average) number of years of work experience of the founder(s)	How many years of work experience as an employee did you have before you founded this firm?
Entrepreneurial experience	A dummy variable that equals to one if (one of) the founder(s) has founded at least one firm in the past, and zero otherwise	Had (one of) the founder(s) already founded one or more firms before this company? [Answers: no, yes]
Education	A continuous variable indicating the highest level of professional qualification that the founder(s) has (have) acquired (0=no primary education, 1=primary education, 2=secondary education, 3=postsecondary education, 4=bachelor, 5=master, 6=doctorate)	Which is the highest professional qualification that the founder(s) has (have) acquired? [Answers: no primary education, primary education, secondary education, postsecondary education, bachelor, master, doctorate]
Founding team	A dummy variable that equals one if the firm has been founded by more than one individual, and zero otherwise	Was your firm set up by one single founder or by a team of several founders? [Answers: one founder, a founding team]
Firm-level control variables		
Firm age	The natural logarithm of the firm's age as at the reference year from date of incorporation.	In which year was your firm established?
Firm size	The natural logarithm of the number of employees (in FTE), including the founders, working for the firm.	How many employees (in FTE), including the founders, worked for the firm in the first year after incorporation?
Sales	The natural logarithm of the firm's amount of sales	What was the amount of sales (in €) in the year 20XX?

Tangibility	The percentage of the firm's expenditure on capital investments to its total amount of financing desired (i.e., total amount of operating costs and capital investments)	– What was the amount of operating costs (in €) in the year 20XX? – What was the amount of total capital investments (in €) in the year 20XX?
Personal debt	The natural logarithm of the amount of financing provided by founders and top management team.	What is the amount of financing (in €) that your firm has actually obtained in 20XX from members of the top management team (including private wealth of the founders)?
Equity	The natural logarithm of the amount of equity financing (i.e., business angels and venture capitalists) obtained by the firm.	What is the amount of financing (in €) that your firm has actually obtained in 20XX from: – Business angels – Venture capitalists
Legal form	A dummy variable equal to one if the firm is registered as a legal person, and zero if registered as a natural person.	No survey question included. The firm's legal form was obtained from 'Kruispuntbank van Ondernemingen'.
Medium-high tech	A dummy variable equal to one if the firm is active in a medium and high-tech industry (as defined in Table A2 in Appendix A).	No survey question included. The firm's industry classification was obtained from 'Kruispuntbank van Ondernemingen'.
Wave dummies	Wave dummies with Wave 1 equal to one for firms surveyed in 2017 and zero otherwise; Wave 2 equal to one for firms surveyed in 2018 and zero otherwise; Wave 3 equal to one for firms surveyed in 2019 and zero otherwise; Wave 4 equal to one for firms surveyed in 2020 and zero otherwise.	No survey question included.
Service (used as exclusion restriction in the first stage of the Heckman model)	A dummy variable equal to one if the firm is active in a service industry (which includes 'technology-intensive industries', 'skill-intensive services', 'other business-oriented services', 'consumer-oriented services', 'construction') as defined in Table A2 in Appendix A) and zero otherwise (which includes 'cutting-edge technology manufacturing', 'high-technology manufacturing', 'software', 'non-high-tech manufacturing', 'non-high-tech manufacturing', 'wholesale and retail trade' as defined in Table A2 in Appendix A).	No survey question included. The firm's industry classification was obtained from 'Kruispuntbank van Ondernemingen'.

APPENDIX C

Table C1. Descriptive statistics of and mean comparison tests between (1) new firms that sought debt financing and (2) new firms that did not seek debt financing

	New firms that sought debt financing (n=298)		New firms that did not seek debt financing (n=1,547)		Comparison of means	
	Mean	Std. dev.	Mean	Std. dev.	T-test stat.	p-value
Whether or not applied for (%)…						
– Debt financing	100.000	0.000	0.000	0.000	NA	NA
– Trade credit	16.779	37.430	0.000	0.000	-17.651	0.000
– Leasing	39.933	49.058	0.000	0.000	-32.052	0.000
– Short and long term loans by financial institutions	59.732	49.126	0.000	0.000	-47.877	0.000
– Other financing by financial institutions	11.745	32.250	0.000	0.000	-14.341	0.000
– Equity financing	4.362	20.460	1.228	11.018	-3.808	0.000
– Business angels	4.362	20.460	0.970	9.802	-4.408	0.000
– Venture capitalists	1.352	11.527	0.582	7.608	-1.437	0.151
– Top management team	42.617	49.535	33.937	47.365	-2.875	0.004
– Family and friends	18.792	39.130	6.852	25.272	-6.747	0.000
– Government	9.732	29.689	2.650	16.068	-5.911	0.000
– Accelerators, incubators, and universities	2.013	14.070	0.840	9.131	-1.838	0.066
– Other companies	2.349	15.171	1.487	12.106	-1.077	0.281
– Crowdfunding	3.356	18.039	0.388	6.218	-5.092	0.000
Planned amount[1]						
– Debt financing	142,838.300	498,787.800	0.000	0.000	-11.277	0.000
– Trade credit	14,152.680	62,451.250	0.000	0.000	-8.924	0.000
– Leasing	29,566.940	261,601.400	0.000	0.000	-4.451	0.000
– Short and long term loans by financial institutions	90,612.700	384,565.000	0.000	0.000	-9.278	0.000
– Other financing by financial institutions	8,515.960	49,191.300	0.000	0.000	-6.817	0.000
– Equity financing (BAs and VCs)	21,177.850	160,086.800	5,989.010	99,953.860	-2.147	0.032
– Business angels	11,781.880	74,732.630	2,288.300	29,344.380	-3.726	0.000
– Venture capitalists	9,395.970	100,314.200	3,700.710	91,961.650	-0.964	0.335
– Top management team	22,764.600	94,859.470	4,781.330	22,717.730	-6.551	0.000
– Family and friends	5,076.730	18,706.850	911.460	7,711	-6.372	0.000
– Government	11,437.750	60,749.020	1,730.660	20,385.610	-4.996	0.000
– Accelerators, incubators, and universities	1,359.060	11,774.330	1,040.730	15,972.660	-0.327	0.744
– Other companies	4,123.320	51,488.700	7,676.910	207,970.200	0.293	0.769
– Crowdfunding	2,753.360	36,733.450	113.640	3832.300	-3.696	0.001
Obtained amount[1]						
– Debt financing	123,658.900	496,708.600	0.000	0.000	-9.803	0.000
– Trade credit	9,280.870	51,680.240	0.000	0.000	-7.071	0.000
– Leasing	28,218.285	261,588.300	0.000	0.000	-4.248	0.000
– Short and long term loans by financial institutions	81,230.990	383,331.100	0.000	0.000	-8.344	0.000
– Other financing by financial institutions	4,928.710	39,268.100	0.000	0.000	-4.942	0.000
– Equity financing (BAs and VCs)	6,409.400	58,971.490	1,415.640	32,035.820	-2.094	0.036

– Business angels	5,318.790	49,229.580	1,040.720	16,722.400	-2.329	0.020
– Venture capitalists	1,090.600	18,826.740	374.920	12,797.120	-0.811	0.417
– Top management team	21,365.280	91,306.330	4,670.850	21,520.650	-6.341	0.000
– Family and friends	4,355.310	19,393.710	842.650	7,568.240	-5.327	0.000
– Government	3,823.990	26,767.510	1,147.100	16,722.400	-2.262	0.024
– Accelerators, incubators, and universities	1,677.850	17,805.640	232.710	4,586.120	-2.755	0.006
– Other companies	163.590	1,863.240	375.100	6,697.370	0.418	0.676
– Crowdfunding	1.010	17.380	100.490	3,815.730	0.450	0.653
Financial knowledge						
Financial knowledge depth of…						
– Debt financing	0.698	1.237	0.270	0.830	-7.447	0.000
– Equity financing (BA and VCs)	0.130	0.250	0.050	0.170	-6.665	0.000
Average financial knowledge of…						
– Debt financing	4.190	1.710	3.130	1.780	-9.483	0.000
– Trade credit	3.670	2.310	2.840	2.030	-6.329	0.000
– Leasing	4.430	2.120	3.310	2.100	-8.443	0.000
– Short and long term loans by financial institutions	4.820	1.930	3.620	2.110	-9.066	0.000
– Other financing by financial institutions	3.670	2.160	2.700	1.940	-7.709	0.000
– Equity financing	2.150	1.760	1.970	1.600	-1.781	0.075
– Business angels	2.230	1.900	2.000	1.710	-2.093	0.037
– Venture capitalists	2.070	1.770	1.940	1.620	-1.297	0.195
– Top management financing	4.460	2.260	4.060	2.300	-2.753	0.006
– Family and friends financing	4.040	2.250	3.510	2.200	-3.818	0.000
– Government financing	2.820	2.050	2.500	1.780	-2.742	0.006
– Business angels	2.230	1.900	2.000	1.710	-2.093	0.037
– Venture capitalists	2.070	1.770	1.940	1.620	-1.297	0.195
– Accelerators, incubators, and universities	1.980	1.670	1.900	1.560	-0.832	0.405
– Other companies	2.500	1.870	2.310	1.700	-1.741	0.082
– Crowdfunding	2.720	2.020	2.820	1.920	0.808	0.419
Growth-oriented strategies						
– Internationalization	8.010	20.437	8.470	22.250	0.330	0.741
– Innovation	0.199	0.364	0.220	0.390	0.660	0.509
Control variables						
– Work experience[a]	14.338	8.995	13.520	10.680	-1.232	0.218
– Entr. exp.	0.483	0.501	0.280	0.450	-6.942	0.000
– Education	3.879	1.200	4.050	1.140	2.416	0.016
– Founding team	0.265	0.442	0.150	0.350	-5.028	0.000
– Firm age[a]	1.302	0.611	1.470	0.730	3.712	0.000
– Firm size[a]	2.127	2.655	1.380	1.520	-6.736	0.000
– Sales[a]	145,991.200	322,392.100	83,367.940	361,847.600	-2.782	0.006
– Tangibility	0.520	0.323	0.460	0.340	-2.671	0.008
– Personal debt[a]	21,365.280	91,306.330	4,670.850	21,520.560	-6.341	0.000
– Equity[a]	6409.400	58,971.490	1,415.640	32,035.820	-2.094	0.036
– Legal form	0.651	0.477	0.419	0.494	-7.474	0.000
– Medium-high tech	0.517	0.501	0.560	0.500	1.409	0.159

[1] With imputed zeros for each financing alternative the respondent indicated he/she did not seek, [a] The actual value was used for the descriptive statistics.

Table C2. Descriptive statistics of and mean comparison tests between founders with (1) below-average financial knowledge depth of debt financing and (2) above-average financial knowledge depth of debt financing

	Fin. know. depth < average fin. know. depth (N=204)							Fin. know. depth >= average fin. know. depth (N=94)							Comparison of means	
	25th percentile	Mean	Median	75th percentile	SD	Min	Max	25th percentile	Mean	Median	75th percentile	SD	Min	Max	T test stat.	p-value
Debt fin. ability	1.000	0.809	1.000	1.000	0.371	0.000	1.000	1.000	0.904	1.000	1.000	0.251	0.000	1.000	-2.243	0.026
Planned amount debt	15.500	75.322	30.000	60.000	131.967	0.066	900.000	25.000	289.395	55.000	220.000	854.351	2.500	6,000.000	-3.508	0.001
Obtained amount debt	8.000	53.032	25.000	45.000	106.042	0.000	800.000	20.000	279.934	47.500	200.000	853.626	0.000	6,000.000	-3.692	0.000
Knowledge depth	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	2.213	2.000	4.000	1.226	1.000	4.000	-25.834	0.000
Internationalization	0.000	7.779	0.000	3.000	20.192	0.000	100.000	0.000	8.511	0.000	3.000	21.058	0.000	100.000	-0.287	0.775
Innovation	0.000	0.200	0.000	0.210	0.369	0.000	1.000	0.000	0.199	0.000	0.200	0.355	0.000	1.000	0.027	0.979
Work experience[a]	7.000	13.868	12.500	20.000	9.053	0.000	40.000	8.000	15.357	15.000	20.000	8.831	0.000	45.000	-1.330	0.185
Entr. exp.	0.000	0.475	0.000	1.000	0.501	0.000	1.000	0.000	0.500	0.500	1.000	0.503	0.000	1.000	-0.392	0.695
Education	3.000	3.882	4.000	5.000	1.194	0.000	6.000	3.000	3.872	4.000	5.000	1.220	1.000	6.000	0.067	0.947
Founding team	0.000	0.240	0.000	0.000	0.428	0.000	1.000	0.000	0.319	0.000	1.000	0.469	0.000	1.000	-1.435	0.152
Firm age[a]	1.000	1.255	1.000	1.000	0.565	1.000	3.000	1.000	1.404	1.000	2.000	0.693	1.000	3.000	-1.971	0.050
Firm size[a]	0.150	1.984	1.000	2.000	2.517	0.150	20.000	1.000	2.438	1.000	2.000	2.923	0.500	15.000	-1.375	0.170
Sales[a,b]	15.239	134.282	55.000	120.000	307.601	0.000	2,500.000	20.000	171.403	79.000	160.000	352.763	0.000	2,8000.000	-0.923	0.357
Tangibility	0.217	0.506	0.511	0.776	0.320	0.000	1.000	0.250	0.552	0.545	0.857	0.330	0.000	1.000	-1.142	0.254
Personal debt[a,b]	0.000	19.646	0.000	10.000	90.397	0.000	1,000.000	0.000	25.098	0.000	10.000	93.629	0.000	800.000	-0.478	0.633
Equity[a,b]	0.000	6.176	0.000	0.000	55.033	0.000	650.000	0.000	6.915	0.000	650.000	67.042	0.000	650.000	-0.100	0.920
Legal form	0.000	0.647	1	1	0.479	0	1	0	0.660	1	1	0.476	0.000	1.000	-0.210	0.834
Medium-high tech	0.000	0.539	1.000	1.000	0.500	0.000	1.000	0.000	0.468	0.000	1.000	0.502	0.000	1.000	1.141	0.255

[a] The actual value was used for the descriptive statistics.
[b] In thousands of Euros

Table C3. Descriptive statistics of and mean comparison tests between new firms that applied for (1) one type of debt financing and (2) more than one type of debt financing

	Applied for one type of debt financing (n=232)							Applied for more than one type of debt financing (n=66)							Comparison of means	
	25th percentile	Mean	Median	75th percentile	SD	Min	Max	25th percentile	Mean	Median	75th percentile	SD	Min	Max	T test stat.	p-value
Knowledge depth	0.000	0.603	0.000	1.000	1.161	0.000	4.000	0.000	1.030	0.000	2.000	1.435	0.000	4.000	-2.494	0.013
Internationalization	0.000	6.763	0.000	2.000	18.935	0.000	100.000	0.000	12.394	0.000	10.000	24.680	0.000	100.000	-1.985	0.048
Innovation	0.000	0.170	0.000	0.000	0.342	0.000	1.000	0.000	0.302	0.000	0.750	0.420	0.000	1.000	-2.628	0.009
Work experience[a]	7.000	14.399	13.292	20.000	9.064	0.000	45.000	7.000	14.124	14.167	20.000	8.815	0.000	40.000	0.219	0.827
Entr. exp.	0.000	0.453	0.000	1.000	0.499	0.000	1.000	0.000	0.591	1.000	1.000	0.495	0.000	1.000	-1.991	0.047
Education	3.000	3.897	4.000	5.000	1.176	0.000	6.000	3.000	3.818	4.000	5.000	1.288	1.000	6.000	0.468	0.641
Founding team	0.000	0.259	0.000	1.000	0.439	0.000	1.000	0.000	0.288	0.000	1.000	0.456	0.000	1.000	-0.474	0.636
Firm age[a]	1.000	1.315	1.000	1.000	0.631	1.000	3.000	1.000	1.258	1.000	1.000	0.535	1.000	3.000	0.669	0.504
Firm size[a]	1.000	1.829	1.000	2.000	1.999	0.150	16.000	1.000	3.175	1.000	3.000	4.071	0.500	20.000	-3.713	0.000
Sales[a,b]	17.500	119.914	65.000	120.000	263.642	0.000	2500.000	10.000	237.656	50.000	200.000	465.762	0.000	2800.000	-2.644	0.009
Tangibility	0.244	0.527	0.545	0.797	0.325	0.000	1.000	0.167	0.497	0.519	0.778	0.381	0.000	1.000	0.664	0.507
Personal debt[a,b]	0.000	16.554	0.000	10.000	79.954	0.000	1000.000	0.000	38.277	0.000	15.000	131.216	0.000	800.000	-1.711	0.088
Equity[a,b]	0.000	2845.000	0.000	0.000	42677.000	0.000	650.000	0.000	18.939	0.000	0.000	95.983	0.000	650.000	-1.966	0.050
Legal form	0.000	0.651	1.000	1.000	0.478	0.000	1.000	0.000	0.652	1.000	1.000	0.480	0.000	1.000	-0.010	0.992
Medium-high tech	0.000	0.530	1.000	1.000	0.500	0.000	1.000	0.000	0.470	0.000	1.000	0.503	0.000	1.000	0.866	0.387

[a] The actual value was used for the descriptive statistics.
[b] In thousands of Euros

Appendix D. Common method bias

As with all cross-sectional survey data collected from a sole respondent, this research design might introduce common method bias, with the possibility to over or underestimate the underlying relationships between our variables of interest. We applied various survey design techniques to reduce the risk of common method bias. Items were pre-tested for their unambiguity and clearness (Podsakoff et al., 2003) and the questions pertaining to founders' knowledge of debt financing and the amount of debt financing sought and obtained used different response formats, thereby creating methodological separation of measurement (Podsakoff et al., 2003). Moreover, to reduce respondents' tendency to provide socially desirable answers, we assured the respondents confidentiality (Podsakoff et al., 2003). Moreover, we applied a correlational marker technique (Lindell and Whitney, 2001) to rule out common method effects. Technological experience, measured as the level of technological knowledge and experience possessed at founding by the founder, or – in case of multiple founders – by the team on a 7-point Likert scale (ranging from 'very low' to 'very high'), was selected as a marker variable and showed, in line with our expectations, no significant correlation with the extent to which the new firm internationalizes (r_M= -0.04; $p>0.1$). The size and significance of the correlation among our variables of interest, when partialling out the effect of r_M, was not substantially influenced. Thus, common method bias should not be a major issue in our study.

Appendix E. Descriptive statistics of the debt application process (N=298)

Panel A.

	Trade credit	**Leasing**	**Short- and long-term loans by financial institutions**	**Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines)**
Number of new firms that did not apply for this type of financing, but did seek debt financing elsewhere	248	179	120	259
Number of new firms that did apply for this type of financing	50	119	178	35
Number of new firms that did apply for this type of financing, but no finance offered	12	10	25	11
Number of new firms that did apply for this type of financing, but less than the full amount offered	8	4	14	2
Number of new firms that did apply for this type of financing and full amount offered	30	105	139	22
% of new firms (that applied for debt financing) that applied for this type of debt financing	17.11	39.93	59.73	11.75

Panel B.

	Trade credit	**Leasing**	**Short- and long-term loans by financial institutions**	**Other financing by financial institutions (e.g., bank overdrafts, mixed credit lines)**
Planned amount (in €)	84,350.00	74,041.57	151,699.90	72,507.28
Obtained amount (in €)	55,314.00	70,664.26	135,993.50	41,964.42
% of financing obtained	68.15	90.37	81.81	64.75
Mean % of total debt financing obtained from this source	10.06	34.38	50.46	5.10
Median % of total debt financing obtained from this source	0.00	0.00	50.000	0.00
Standard deviation of % of total debt financing obtained from this source	27.60	45.90	47.65	20.11
Minimum % of total debt financing obtained from this source	0.00	0.00	0.00	0.00
Maximum % of total debt financing obtained from this source	100.00	100.00	100.00	100.00

Appendix F. Endogeneity and Robustness tests

Endogeneity

Given the cross-sectional nature of our survey data, a simultaneity issue between the knowledge *depth* variable and the new firm's *debt financing ability* may arise. While a founder's financial knowledge may affect the new firms' ability to obtain the desired amount of debt financing, attempts to obtain debt financing may also generate new financial knowledge on the side of the founder. We undertook several analyses to verify the severity of this potential endogeneity issue.

First, we exploited follow-up survey data for new firms and linked their founder's *knowledge depth* at the time of the first survey with the new firm's *debt financing ability* in the next year. As only 74 new firms participated in the follow-up survey and tried to obtain debt financing in that consecutive year, we were unable to run our regression analyses with this one year time lag. However, we were able to use this follow-up survey data to investigate whether the change in knowledge *depth* of founders that had applied for debt financing was significantly different from the change in knowledge *depth* of founders that had not applied for debt financing.[1] A t-test did not reveal any significant differences ($p>0.1$) and lends support for causal interpretation of our results.

Second, we reduced this endogeneity concern by instrumenting *knowledge depth*. Following recent research (e.g., Um *et al.*, 2021; Zolotoy *et al.*, 2022), we use the frugal IV method (Lewbel, 2012), which relies on heteroscedasticity in the error term of the first-stage regression to construct synthetic IVs. The method allowed us to identify a strong frugal IV for *knowledge depth* (F-stat=12.60>10), and the results of a Wooldridge's score (F-stat=0.23,

[1] We used data on 329 new firms that participated in a first survey wave (i.e., 2017 or 2018 or t=0) as well as in its two subsequent follow-up survey waves. Whether the founder applied for debt financing was measured in t=1. The change in founders' knowledge depth was measured by comparing founders' knowledge depth in t=0 and t=2.

p>0.10) indicated that our estimates are not affected by endogeneity. Results are presented in Table F1 in Appendix F.

Furthermore, as the new firm's decision to pursue a growth-oriented strategy is a decision that is most likely not made at random, selection effects may pose endogeneity issues (Patel *et al.*, 2018). As prior studies have shown that the strategic behavior of other related firms within the industry is likely to affect a firm's internationalization strategy (Guillén, 2002) but not its ability to obtain debt financing, we exploited *industry mimetic export behavior* as a potential IV for *internationalization* (Patel *et al.*, 2018).[2] It serves as a valid IV (F-stat=10.20>10, p<0.01) and allows us to conclude that the main model does not suffer from this particular endogeneity issue (Wooldridge's score: F-stat=1.90, p>0.10 and F-stat=1.20, p>0.10 for the model without and with interaction effects, respectively). Results are presented in Table F2 in Appendix F. With respect to *innovation*, we were not able to identify a strong external or frugal IV.

Furthermore, we included two additional controls. First, we controlled for *government subsidies* measured as log-transformed amount of financing obtained from the government (capital grants, interest grants, venture capital, loans and guarantees) in the reference year. Our results remain robust (Table F3 in Appendix F). Next, we included the new firm's log-transformed *profitability* in the reference year as an additional control variable. Our results remain robust (Table F4 in Appendix F).

Robustness tests

We conducted several robustness analyses. First, our dependent variable (i.e., *debt financing ability)* is the ratio of two self-reported variables: the amount of debt financing the new firm obtained and the amount of debt financing the new firm sought in the reference year (Cosh *et*

[2] *Industry mimetic export behavior* was measured as the export to GDP ratio per industry two years before a new firm's foundation (data retrieved from Eurostat).

al., 2009). Readers may wonder whether the positive relationship between depth of debt financing knowledge and this ratio really represents an increased ability to obtain debt financing, or merely a decrease in the amount of debt financing sought by more knowledgeable entrepreneurs. To provide a more fine-grained understanding of the underlying mechanisms, we disaggregated our dependent variable (Table F5 and F6 in Appendix F). Results show that the depth of a founder's debt financing knowledge is positively associated with the amount of debt financing *sought* and *obtained*. The positive association between knowledge *depth* and the amount of debt financing *obtained* is even stronger for new firms that internationalize more.

Second, we used several alternative measures. We used a cut-off value of 6 instead of 7 on the Likert scale for measuring *knowledge depth* (Table F7 in Appendix F). Additionally, we constructed (a) a less strict measure of the *depth* of a founder's debt financing knowledge by including governments and crowdfunding campaigns as additional debt financing sources (Table F8 in Appendix F) and (b) a more strict measure of *knowledge depth* by excluding trade credit and leasing as debt financing sources (Table F9 in Appendix F). Results remain robust. Next, instead of using the percentage of new firm's customers from abroad as a measure of *internationalization*, we replaced it with a (log-transformed) continuous variable representing the number of foreign countries in which the new firm has customers (Dai *et al.*, 2014) (Table F10 in Appendix F). Our results remain robust. Further, we used *team size* instead of team dummy as a control variable (Table F11 in Appendix F), and used *firm size* in the reference year instead of at business foundation (Table F12 in Appendix F). Our results remain similar.

Next, we imposed several stricter sample restrictions. All results remain robust. First, we performed an analysis including only new firms up that are up to two (Table F13 in Appendix F) and one year old (Table F14 in Appendix F) in order to further reduce concerns of survivorship bias. Second, in case there is a founding team, it is not only the financial knowledge of the contacted founder that might matter, but also that of the other founders. We

conducted an analysis including only new firms with a single founder (Table F15 in Appendix F). Third, we ran Heckman models of knowledge depth of debt financing, internationalization, and innovation on new firm's ability to obtain ST and LT loans financing (Table F16 in Appendix F) and of financial knowledge depth of ST and LT loans**,** internationalization, and innovation on new firm's ability to obtain ST and LT loans (Table F17 in Appendix F). Fourth, we ran Heckman models on the subsample of firms that applied for debt financing but not for equity financing (Table F18 in Appendix F) and on the subsample of firms that applied for debt financing but not for crowdfunding (Table F19 in Appendix F).

Finally, we tested if our results were affected by outliers. In a first test, we removed observations in the data below the 25 percentile and above the 75 percentile of the variables internationalization and innovation (Hair et al., 2010). Our results remain stable (Table F20 in Appendix F). In a second test, we log-transformed the variables internationalization and innovation. Our results remain stable (Table F21 in Appendix F).

Table F1. Heckman model instrumenting *knowledge depth* with a frugal IV

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.124***	0.076**	0.063**
	(0.037)	(0.032)	(0.029)
Internationalization	-0.001	-0.003***	-0.004**
	(0.002)	(0.001)	(0.001)
Innovation	-0.077	-0.201***	-0.223**
	(0.101)	(0.062)	(0.078)
Knowledge depth x Internationalization			0.001
			(0.001)
Knowledge depth x Innovation			0.034
			(0.067)
Controls	Included	Included	Included
Service	0.260**		
	(0.101)		
Mills ratio (lambda)		0.392**	0.409**
		(0.193)	(0.188)
N	1,845	298	298
Model fit ($\chi 2$)		97.93***	103.45***
R^2		0.251	0.258

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F2. Heckman model instrumenting *internationalization* with *industry mimetic export behavior*

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.196***	0.0721***	0.061*
	(0.036)	(0.028)	(0.035)
Internationalization	0.115*	0.001	-0.000
	(0.062)	(0.003)	(0.004)
Innovation	-0.072	-0.214***	-0.215***
	(0.102)	(0.066)	(0.075)
Knowledge depth x Internationalization			0.001
			(0.004)
Knowledge depth x Innovation			-0.003
			(0.054)
Controls	Included	Included	Included
Service	0.392***		
	(0.127)		
Mills ratio (lambda)		0.299	0.310
		(0.173)	(0.168)
N	1,845	298	298
Model fit ($\chi 2$)		88.26***	91.20***
R^2		0.214	0.217

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F3. Heckman model including an additional control variable, i.e., *government subsidies* (log)[3]

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.195***	0.039***	0.026*
	(0.036)	(0.014)	(0.015)
Internationalization	-0.001	-0.003**	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.068	-0.168***	-0.173**
	(0.102)	(0.060)	(0.069)
Knowledge depth x Internationalization			0.001**
			(0.001)
Knowledge depth x Innovation			0.007
			(0.039)
Government subsidies	0.226***	0.024	-0.042
	(0.078)	(0.241)	(0.251)
Controls	Included	Included	Included
Service	0.269***		
	(0.101)		
Mills ratio (lambda)		0.043	0.043
		(0.026)	(0.024)
N	1,845	298	298
Model fit (χ2)		.	.
Wald test (χ2)		2.86*	3.36*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

[3] Chi2 model statistic is reported as missing in Stata. Stata has done that so as to not be misleading, not because there is something necessarily wrong with the model.

Table F4. Heckman model including an additional control variable, i.e., *profitability* (log)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.180***	0.043***	0.031**
	(0.038)	(0.014)	(0.016)
Internationalization	-0.001	-0.004***	-0.005***
	(0.002)	(0.001)	(0.001)
Innovation	-0.064	-0.134**	-0.132*
	(0.108)	(0.062)	(0.069)
Knowledge depth × Internationalization			0.002***
			(0.001)
Knowledge depth x Innovation			-0.006
			(0.039)
Profitability	-0.020***	0.003	0.003
	(0.006)	(0.003)	(0.003)
Controls	Included	Included	Included
Service	0.313***		
	(0.106)		
Mills ratio (lambda)		0.061	0.059
		(0.027)	(0.025)
N	1,678	268	268
Model fit ($\chi 2$)		103.17***	115.90***
Wald test ($\chi 2$)		5.80**	6.65***

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F5. Heckman model with the *amount of debt financing sought* (log) as dependent variable

	First stage External debt sought	***Second stage*** Amount of debt fin. sought	***Second stage*** Amount of debt fin. sought
Knowledge depth	0.199***	0.260***	0.274***
	(0.036)	(0.063)	(0.068)
Internationalization	-0.001	0.002	0.001
	(0.002)	(0.003)	(0.004)
Innovation	-0.072	0.072	0.161
	(0.101)	(0.202)	(0.219)
Knowledge depth x Internationalization			0.002
			(0.003)
Knowledge depth x Innovation			-0.159
			(0.181)
Controls	Included	Included	Included
Service	0.261***		
	(0.097)		
Mills ratio (lambda)		0.519	0.529
		(0.164)	(0.171)
N	1,845	298	298
Model fit ($\chi 2$)		165.21***	163.27***
Wald test ($\chi 2$)		10.18***	9.67***

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F6. Heckman model with the *amount of debt financing obtained* (log) as dependent variable

	First stage External debt sought	***Second stage*** Amount of debt fin. obtained	***Second stage*** Amount of debt fin. obtained
Knowledge depth	0.195***	0.632***	0.462***
	(0.036)	(0.142)	(0.160)
Internationalization	-0.001	-0.018	-0.028*
	(0.002)	(0.012)	(0.015)
Innovation	-0.067	-1.416**	-1.563**
	(0.102)	(0.652)	(0.756)
Knowledge depth x Internationalization			-0.028*
			(0.015)
Knowledge depth x Innovation			-1.563**
			(0.756)
Controls	Included	Included	Included
Service	0.276***		
	(0.103)		
Mills ratio (lambda)		0.595	0.579
		(0.265)	(0.253)
N	1,845	298	298
Model fit (χ2)		77.43***	86.29***
Wald test (χ2)		5.69**	5390**

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F7. Heckman model with less strict measure of *knowledge depth* (cut-off value of 6 instead of 7)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.186***	0.033***	0.031**
	(0.027)	(0.012)	(0.013)
Internationalization	-0.001	-0.003**	-0.004**
	(0.002)	(0.001)	(0.002)
Innovation	-0.065	-0.168***	-0.134
	(0.102)	(0.060)	(0.082)
Knowledge depth x Internationalization			0.001
			(0.001)
Knowledge depth x Innovation			-0.023
			(0.036)
Controls	Included	Included	Included
Service	0.269		
	(0.102)		
Mills ratio (lambda)		0.044	0.043
		(0.023)	(0.023)
N	1,845	298	298
Model fit ($\chi 2$)		91.70***	97.61***
Wald test ($\chi 2$)		3.77*	3.81*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F8. Heckman model with less strict measure of *knowledge depth* (including governments and crowdfunding campaigns)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.146***	0.030***	0.019
	(0.028)	(0.011)	(0.012)
Internationalization	-0.001	-0.003***	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.074	-0.171***	-0.177***
	(0.102)	(0.060)	(0.068)
Knowledge depth x Internationalization			0.000**
			(0.000)
Knowledge depth x Innovation			0.008
			(0.026)
Controls	Included	Included	Included
Service	0.269***		
	(0.101)		
Mills ratio (lambda)	0.042	0.042	0.043
	(0.026)	(0.026)	(0.024)
N	1,845	298	298
Model fit (χ2)		89.97***	97.57***
Wald test (χ2)		2.76*	3.49*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F9. Heckman model with more strict measure of measure of *knowledge depth* (excluding trade credit and leasing)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.314***	0.068***	0.055**
	(0.065)	(0.023)	(0.025)
Internationalization	-0.001	-0.003**	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.071	-0.168***	-0.165**
	(0.101)	(0.060)	(0.067)
Knowledge depth x Internationalization			0.002
			(0.001)
Knowledge depth x Innovation			-0.015
			(0.070)
Controls	Included	Included	Included
Service	0.268***		
	(0.100)		
Mills ratio (lambda)		0.039	0.041
		(0.026)	(0.025)
N	1,845	298	298
Model fit ($\chi 2$)		89.83***	98.03***
Wald test ($\chi 2$)		2.38	2.93*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F10. Heckman model with alternative measure for *internationalization* (measured as the number of foreign countries in which the new firm has customers (log))

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.196***	0.035***	0.021
	(0.036)	(0.013)	(0.015)
Internationalization	0.046	-0.045	-0.062*
	(0.063)	(0.030)	(0.035)
Innovation	-0.091	-0.184***	-0.194***
	(0.102)	(0.063)	(0.072)
Knowledge depth × Internationalization			0.027*
			(0.016)
Knowledge depth x Innovation			0.013
			(0.039)
Controls	Included	Included	Included
Service	0.291***		
	(0.101)		
Mills ratio (lambda)		0.033	0.031
		(0.026)	(0.026)
N	1,839	296	296
Model fit ($\chi 2$)		89.91***	91.09***
Wald test ($\chi 2$)		1.60	1.49

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F11. Heckman model with alternative measure for *founding team* (measured as the number of founders at business foundation)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.194***	0.039***	0.026*
	(0.036)	(0.013)	(0.014)
Internationalization	-0.001	-0.003***	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.065	-0.168***	-0.174**
	(0.102)	(0.060)	(0.069)
Knowledge depth × Internationalization			0.001**
			(0.001)
Knowledge depth x Innovation			0.008
			(0.039)
Founding team	-0.122**	0.011	0.011
	(0.060)	(0.029)	(0.029)
Controls	Included	Included	Included
Service	0.264***		
	(0.101)		
Mills ratio (lambda)		0.041	0.041
		(0.026)	(0.024)
N	1,845	298	298
Model fit ($\chi 2$)		89.98***	98.54***
Wald test ($\chi 2$)		2.60	3.07*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F12. Heckman model with alternative measure for *firm size* (measured as number of full-time equivalents in the reference year (log))

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.198***	0.041***	0.028*
	(0.036)	(0.014)	(0.015)
Internationalization	-0.001	-0.003**	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.093	-0.181***	-0.188***
	(0.103)	(0.062)	(0.070)
Knowledge depth x Internationalization			0.001**
			(0.001)
Knowledge depth x Innovation			0.010
			(0.038)
Firm size	0.293***	0.022	0.015
	(0.071)	(0.029)	(0.027)
Controls	Included	Included	Included
Service	0.285***		
	(0.101)		
Mills ratio (lambda)		0.046	0.046
		(0.026)	(0.024)
N	1,841	295	295
Model fit ($\chi 2$)		89.30***	95.74***
Wald test ($\chi 2$)		3.41*	3.88**

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F13. Heckman model on the subsample of firms that are up to two years old

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.185***	0.049***	0.030*
	(0.038)	(0.012)	(0.016)
Internationalization	-0.001	-0.003***	-0.005***
	(0.002)	(0.001)	(0.001)
Innovation	-0.093	-0.180***	-0.139**
	(0.109)	(0.061)	(0.069)
Knowledge depth x Internationalization			0.001***
			(0.001)
Knowledge depth x Innovation			-0.012
			(0.041)
Controls	Included	Included	Included
Service	0.281**		
	(0.110)		
Mills ratio (lambda)		0.046	0.047
		(0.027)	(0.026)
N	1,605	274	274
Model fit ($\chi 2$)		57.36***	61.71***
Wald test ($\chi 2$)		3.22*	3.62*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F14. Heckman model on the subsample of firms that are up to one year old

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.158***	0.034***	0.019
	(0.044)	(0.012)	(0.012)
Internationalization	-0.002	-0.003**	-0.004**
	(0.002)	(0.001)	(0.002)
Innovation	-0.128	-0.164**	-0.181**
	(0.122)	(0.067)	(0.077)
Knowledge depth x Internationalization			0.001*
			(0.001)
Knowledge depth x Innovation			0.030
			(0.034)
Controls	Included	Included	Included
Service	0.293**		
	(0.123)		
Mills ratio (lambda)		0.043	0.043
		(0.028)	(0.028)
N	1,270	232	232
Model fit ($\chi 2$)		47.50***	43.37***
Wald test ($\chi 2$)		2.54	2.73*

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F15. Heckman model on the subsample of firms with a single founder[4]

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.216***	0.042***	0.025*
	(0.043)	(0.015)	(0.015)
Internationalization	-0.003	-0.003**	-0.005**
	(0.002)	(0.002)	(0.002)
Innovation	-0.055	-0.207***	-0.219**
	(0.116)	(0.077)	(0.086)
Knowledge depth x Internationalization			0.002***
			(0.001)
Knowledge depth x Innovation			0.023
			(0.044)
Controls	Included	Included	Included
Service	0.207*		
	(0.119)		
Mills ratio (lambda)		0.049	0.025
		(0.032)	(0.030)
N	1,538	219	219
Model fit (χ2)		.	.
Wald test (χ2)		2.58	0.75

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

[4] Chi2 model statistic is reported as missing in Stata. Stata has done that so as to not be misleading, not because there is something necessarily wrong with the model.

Table F16. Heckman model: regression results of *knowledge depth* of debt financing, *internationalization*, and *innovation* on new firm's ability to obtain ST and LT loans financing

	First stage ST and LT loans sought	***Second stage*** ST and LT loans ability	***Second stage*** ST and LT loans ability
Knowledge depth	0.204***	0.041**	0.020
	(0.038)	(0.018)	(0.019)
Internationalization	-0.001	-0.003**	-0.006**
	(0.002)	(0.002)	(0.002)
Innovation	0.027	-0.180**	-0.170*
	(0.114)	(0.081)	(0.090)
Knowledge depth x Internationalization			0.002***
			(0.001)
Knowledge depth x Innovation			-0.008
			(0.047)
Controls	Included	Included	Included
Service	0.213*		
	(0.123)		
Mills ratio (lambda)		0.064	0.044
		(0.044)	(0.041)
N	1,845	178	178
Model fit ($\chi 2$)		92.79***	211.49***
Wald test ($\chi 2$)		2.27	1.22

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F17. Heckman model: regression results of *knowledge depth of ST and LT loans*, *internationalization*, and *innovation* on new firm's ability to obtain ST and LT loans

	First stage ST and LT loans sought	***Second stage*** ST and LT loans ability	***Second stage*** ST and LT loans ability
Knowledge depth ST and LT loans	0.693***	0.173***	0.164***
	(0.114)	(0.054)	(0.058)
Internationalization	0.000	-0.003**	-0.005**
	(0.002)	(0.002)	(0.002)
Innovation	0.018	-0.179**	-0.138
	(0.113)	(0.080)	(0.094)
Knowledge depth ST and LT loans x Internationalization			0.005**
			(0.003)
Knowledge depth ST and LT loans x Innovation			-0.178
			(0.139)
Controls	Included	Included	Included
Service	0.209*		
	(0.124)		
Mills ratio (lambda)		0.056	0.052
		(0.045)	(0.044)
N	1,845	178	178
Model fit (χ2)		93.23***	179.20***
Wald test (χ2)		1.66	1.49

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F18. Heckman model on the subsample of firms that applied for debt financing but not for equity financing

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.200***	0.027**	0.015
	(0.037)	(0.013)	(0.014)
Internationalization	-0.001	-0.003**	-0.004***
	(0.002)	(0.001)	(0.001)
Innovation	-0.077	-0.145**	-0.145**
	(0.105)	(0.061)	(0.070)
Knowledge depth x Internationalization			0.001**
			(0.001)
Knowledge depth x Innovation			0.001
			(0.039)
Controls	Included	Included	Included
Service	0.240**		
	(0.103)		
Mills ratio (lambda)		0.022	0.023
		(0.025)	(0.023)
N	1,813	285	285
Model fit ($\chi 2$)		44.74***	48.87***
Wald test ($\chi 2$)		0.79	1.06

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F19. Heckman model on the subsample of firms that applied for debt financing but not for crowdfunding

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.192***	0.039***	0.030**
	(0.036)	(0.013)	(0.014)
Internationalization	-0.001	-0.003**	-0.004**
	(0.002)	(0.001)	(0.001)
Innovation	-0.122	-0.152**	-0.151**
	(0.104)	(0.063)	(0.073)
Knowledge depth x Internationalization			0.001*
			(0.001)
Knowledge depth x Innovation			-0.004
			(0.040)
Controls	Included	Included	Included
Service	0.224**		
	(0.102)		
Mills ratio (lambda)		0.030	0.033
		(0.025)	(0.023)
N	1,829	288	288
Model fit (χ2)		49.34***	56.15***
Wald test (χ2)		1.53	2.25

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

Table F20. Heckman model with removal of outliers for *internationalization* and *innovation*[5]

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.194***	0.022	0.013
	(0.045)	(0.014)	(0.016)
Internationalization	-0.007	-0.017	-0.028
	(0.039)	(0.018)	(0.022)
Innovation	0.235	0.139	0.100
	(0.552)	(0.136)	(0.164)
Knowledge depth × Internationalization			0.016*
			(0.008)
Knowledge depth x Innovation			0.056
			(0.073)
Controls	Included	Included	Included
Service	0.450***		
	(0.137)		
Mills ratio (lambda)		0.055	0.054
		(0.022)	(0.022)
N	1,231	199	199
Model fit (χ2)		.	.
Wald test (χ2)		8.44***	8.04***

Significance levels: * p<0.10, **p<0.05, *** p<0.01.

[5] Chi2 model statistic is reported as missing in Stata. Stata has done that so as to not be misleading, not because there is something necessarily wrong with the model.

Table F21. Heckman model with *internationalization* (log) and *innovation* (log)

	First stage External debt sought	***Second stage*** Debt fin. ability	***Second stage*** Debt fin. ability
Knowledge depth	0.196***	0.038	0.020
	(0.036)	(0.014)	(0.031)
Internationalization	-0.008	-0.034	-0.049***
	(0.027)	(0.015)	(0.018)
Innovation	-0.006	-0.031	-0.032**
	(0.021)	(0.012)	(0.013)
Knowledge depth × Internationalization			0.019***
			(0.007)
Knowledge depth x Innovation			0.000
			(0.007)
Controls	Included	Included	Included
Service	0.268***		
	(0.101)		
Mills ratio (lambda)		0.038	0.037
		(0.026)	(0.024)
N	1,845	298	298
Model fit (χ2)		104.35***	112.97***
Wald test (χ2)		2.28	2.47

Significance levels: * p<0.10, **p<0.05, *** p<0.01.