Paeleman, Ine; Mataigne, Virginie; Vanacker, Tom

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Debt maturity and complete export withdrawal in start-ups

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Debt Maturity and Complete Export Withdrawal in Start-ups

by Ine Paeleman, Virginie Mataigne and Tom Vanacker

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Abstract

Past research shows that firms with constrained access to debt are more likely to withdraw from exporting. We argue that a firm's debt maturity structure (i.e., the short-term/long-term debt mix) also matters because short-term debt entails liquidity risk and long-term debt entails higher costs. Using a database on Belgian start-ups, we find that start-ups relying mainly on either short-term debt or long-term debt exhibit a higher likelihood to withdraw from exporting compared to start-ups with a more balanced debt maturity structure. This U-shaped relationship is weaker for start-ups with more financial slack and stronger for start-ups with higher growth opportunities.

Keywords: Complete export withdrawal, start-ups, debt maturity, financial slack, growth opportunities.
JEL Codes: G32, L26, M13, M16.

Authors:
Ine Paeleman, University of Antwerp.
E-mail: Ine.Paeleman@uantwerpen.be
Virginie Mataigne, Ghent University
E-mail: Virginie.Mataigne@UGent.be
Tom Vanacker, Ghent University and University of Exeter Business School
E-mail: TomR.Vanacker@UGent.be

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Non-technical summary

Exporting is a crucial step for start-ups aiming to expand internationally, but many eventually decide to stop exporting entirely. Our research explores the role of a start-up's debt maturity structure in these decisions. Debt maturity refers to the mix of short-term and long-term debt a company uses. This study focuses on Belgian start-ups and examines how their debt maturity influences their likelihood of completely withdrawing from export markets.

We analyzed data from the National Bank of Belgium, combining export records and financial reports of start-ups founded between 2006 and 2011. The sample includes 1 142 exporting start-ups. We used advanced statistical techniques to control for factors like leverage, firm performance, industry trends, and other characteristics that could influence export withdrawal.

We found a U-shaped relationship between debt maturity and the likelihood of export withdrawal. Start-ups relying heavily on either short-term debt or long-term debt are more likely to stop exporting. An optimal balance between short-term and long-term debt reduces this likelihood. Short-term debt needs frequent repayment or refinancing, creating liquidity risks. These risks are particularly challenging for start-ups that rely heavily on this type of financing. On the other hand, long-term debt offers stability but comes with higher costs, such as increased interest payments. These costs can outweigh the benefits of continuing to export, especially for small firms. Start-ups with more cash reserves (financial slack) are better equipped to manage short-term liquidity risks and higher costs associated with long-term debt. For these firms, the U-shaped relationship between debt maturity and export withdrawal is weaker. Conversely, start-ups with significant growth opportunities face greater uncertainty, making the risks of short-term debt and costs of long-term debt more pronounced. For these firms, the U-shaped relationship is stronger.

This study provides several important implications. For entrepreneurs, a balanced debt maturity structure is crucial. Entrepreneurs should carefully assess the trade-offs between short-term and long-term debt when financing their operations. Maintaining financial slack can help firms sustain exporting activities, even in challenging circumstances. For policymakers, policies encouraging exports should not only focus on increasing firms' access to credit but also on ensuring they adopt a balanced debt structure. Support programs could emphasize financial planning to help start-ups manage liquidity risks and debt costs effectively. For researchers, our findings highlight the importance of considering debt heterogeneity (e.g., short-term vs. long-term debt) in studies of entrepreneurial finance and international business.

This study offers new insights into the financial challenges start-ups face when sustaining their international activities. By focusing on the debt maturity structure, we provide a more nuanced understanding of why some start-ups withdraw from exporting. This perspective can inform better strategies for both entrepreneurs and policymakers to support sustainable international growth.

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1. Introduction

The international entrepreneurship and trade literature have extensively investigated how new firms increase their international footprint (e.g., Conconi et al., 2016; Cumming et al., 2009; Huang et al., 2022; Keupp and Gassmann, 2009; Oviatt and McDougall, 1994; Schwens et al., 2018). Exporting is often the first step in new firms' internationalization process, before actually investing abroad through foreign direct investments (Love and Roper, 2015; Conconi et al., 2016) and financial resources—that allow investments in physical and human resources—have been shown to influence their propensity to start exporting (e.g., Gashi et al., 2014; Kiss et al., 2018; Lin et al., 2009; Love and Roper, 2015; Muûls, 2015; Onkelinx et al., 2016a; Paeleman et al., 2017; Park and LiPuma, 2020). More specifically, start-ups heavily rely on external financial resources and especially debt to fund their early operations and growth (e.g., Cassar, 2004; Cosh et al., 2009). Among the critical resources that start-ups rely on, firm leverage is very important because access to credit fosters exporting (e.g., Gashi et al., 2014).

However, many firms eventually decide to completely withdraw from exporting (Choquette, 2019). For instance, Bernard and Jensen (2004) report that only 85% (69%) of the firms that exported in a specific year also export one (three) year(s) later. Our understanding of export withdrawal, however, remains scarce (e.g., Crick, 2004; Jafari-Sadeghi et al., 2022; Pauwels and Matthyssens, 1999; Sui et al., 2019; Sui and Baum, 2014; Turcan, 2003). Not surprisingly, one common view is that firms stop exporting because of financial underperformance and/or related financial resource constraints (Görg and Spaliara, 2014; Onkelinx et al., 2016b). For example, Görg and Spaliara (2018) show that firms with deteriorated financial health and firms in industries with a greater need for external debt experienced an increased hazard of export withdrawal during the 2007–2009 financial (banking) crisis. Additionally, in the model of Alessandria and Choi (2007), a firm's first exporting activity requires a large initial up-front cost followed by smaller periodical

continuation costs to sustain the exporting activities, and the decision to continue exporting is determined by a trade-off between the costs and benefits of exporting. In line with this model, Muûls (2015) provides evidence of the important sunk costs of starting to export and the impact of credit constraints on the decision to start exporting. Hence, high fixed interest costs and limited access to additional external financial resources limit a start-up's ability to sustain its international activities or aspire to international expansion.

Accordingly, constrained access to financial resources and, in particular, additional debt increases the likelihood that firms stop exporting (Askenazy et al., 2015; Görg and Spaliara, 2018). Credit constraints can be even more acute in exporting start-ups given that they are subject to multiple liabilities (i.e., foreignness, newness, and smallness) because entrepreneurs usually have limited personal financial resources and are hence more dependent on the availability of debt finance (Riding et al., 2012; St-Pierre et al., 2018). Indeed, start-ups heavily rely on debt to finance their initial operations and future growth (e.g., Cassar, 2004; Cosh et al., 2009; Deloof and Vanacker, 2018; Robb and Robinson, 2014). Adding to previous research that investigated the impact of the level of debt (i.e., leverage or debt to total assets) on firms' likelihood to withdraw from exporting, we argue that it is equally important to look at the structure or composition of leverage (i.e., the debt maturity, or the degree to which firms use short-term and/or long-term debt) given the specific costs and benefits associated with short-term and long-term debt (Diamond and He, 2014).

In a world without financial market imperfections, debt maturity should match asset maturity in the sense that investments with a short time horizon should be financed with short-term debt, while long-term investments should be financed with long-term debt (e.g., Van Auken and Holman, 1995). As Heyman et al. (2008: 304) argue "[d]ebt with a maturity shorter than the maturity of assets is risky because the assets might not have yielded enough profit to repay the

debt. Debt with a maturity longer than the maturity of the assets is also risky because debt might have to be repaid after the assets have ceased to yield income". However, due to market imperfections, such as information asymmetry, adverse selection, and liquidity risk, which are even more pronounced in start-ups, a perfect match between asset maturity and debt maturity is seldomly reached.

Specifically, in this paper, we ask the following research question: *How does the debt maturity structure of start-ups influence complete export withdrawal?* Complete export withdrawal here refers to firms ceasing all exports in the international market (Sui et al., 2019). Controlling for the level of leverage, finance theory suggests that when firms primarily use short-term debt that needs to be repaid and refinanced more quickly, *liquidity risk* or rollover risk will be higher (e.g., Diamond, 1991; Cheng and Milbradt, 2012). Specifically, if the investment horizon exceeds the maturity of short-term debt, the firm will have to rollover its short-term debt and renegotiate the financing terms of the new debt that needs to be raised (e.g., Heyman et al., 2008, Lopez-Gracia and Mestre-Barberá, 2015). Moreover, there is always a possibility that banks will no longer want to provide debt, which creates liquidity risk. On the other hand, long-term debt reduces liquidity risk and also provides a tax shield for the long run, but it is more expensive, which in turn might affect the firm's investment decisions (Edwards et al., 2007; Dang and Phan, 2016). Long-term debt is more expensive because banks need to be compensated for the higher adverse selection and moral hazard risk associated with long-term financing (Dang and Phan, 2016). Specifically, banks need to monitor the firm more closely to avoid risk-shifting problems whereby firms engage in more risky projects which when successful benefit shareholders but when unsuccessful harm the bank. Additionally, adverse selection risk is known to be more severe in young and small firms due to higher information asymmetry (Hyytinen and Väänänen, 2006). Taken together, long-term debt is more expensive than short-term debt, especially for start-ups and as such the costs of continuing

to export can outweigh the benefits. More specifically, if the higher cost of long-term debt combined with the continuation cost of exporting (Alessandria and Choi, 2007) exceed the benefits of exporting, start-ups may also decide to withdraw their exporting activities. However, there is an optimal debt maturity that provides firms with the needed flexibility to support their exporting. Accordingly, we hypothesize a U-shaped relationship between debt maturity and complete export withdrawal, based on the mechanisms of *liquidity risk* linked to excessive short-term debt and the *higher cost* linked to excessive long-term debt.

We further examine two moderators that directly link to the theoretical mechanisms of liquidity risk of short-term debt and the higher cost of long-term debt: financial slack and growth opportunities. First, having *financial slack* resources helps firms to deal with unexpected (financial) drawbacks, and also incites them to take more risks (Bromiley, 1991). Accordingly, start-ups with higher levels of financial slack are less likely to exit the export market given that these slack resources can help them overcome the liabilities of foreignness (Sui and Baum, 2014).

More specifically, the availability of financial slack significantly attenuates the short-term debt related liquidity risk because it makes potential refinancing needs less acute (Bromiley, 1991; Harford et al., 2014). Also, the increasing cost associated with a longer debt maturity (i.e. the higher interest and capital repayment) will be less impactful when the firm has a financial cushion in the form of financial slack. Hence, we hypothesize a weaker U-shaped relationship between debt maturity and complete export withdrawal for start-ups with more financial slack.

Second, start-ups with higher *growth opportunities* face higher uncertainty and higher information asymmetry (Riding et al., 2012), which will aggravate the liquidity risk related to short-term debt. More specifically, the uncertainty faced by exporting start-ups with high growth opportunities makes it very difficult for these firms to anticipate their future growth and financial needs, and adapt their capital structure accordingly. Moreover, renegotiating terms in a volatile

environment, in which exporting start-ups with significant growth opportunities operate, can be extremely costly (e.g., Aivazian et al., 2005). Furthermore, start-ups with higher growth opportunities are characterized by higher costs of adverse selection (Riding et al., 2012), which makes long-term debt financing even more costly (Diamond, 1991). Hence, firms with a highly concentrated long-term debt maturity invest less because the benefits of investing will primarily be used to repay debtholders (principal and interest repayment) instead of compensating entrepreneurs for their effort (Myers, 1977) and because the benefits of exporting will no longer outweigh the costs. As such, we hypothesize a stronger U-shaped relationship between debt maturity and complete export withdrawal for start-ups with higher growth opportunities.

To empirically test our hypotheses, we merge two unique databases from the National Bank of Belgium (NBB)—Belgium's Central Bank: (1) the foreign trade database, which comprises detailed data on firms' exporting, and (2) the annual accounts database, which comprises detailed financial accounts data. Controlling for possible self-selection by start-ups into exporting, we examine the likelihood of complete export withdrawal. The Belgian context is interesting for at least two reasons. First, Belgium is a small, open, and export-oriented economy. This context makes exporting important for start-ups. Second, all Belgian firms, even the youngest and smallest (with limited liability of shareholders) report detailed export and financial accounts data to the NBB, thereby providing us with unique data on start-ups.

Consistent with our theorizing, we find a U-shaped relationship between debt maturity and the probability that start-ups completely withdraw from exporting. In other words, both start-ups mainly financed with short-term debt and start-ups mainly financed with long-term debt exhibit higher export withdrawal probabilities. There is an optimal mix of short-term and long-term debt, which minimizes a start-up's complete export withdrawal likelihood. Further, the U-shaped relationship between debt maturity and the probability of complete export withdrawal is especially

strong for start-ups with less financial slack and start-ups with higher growth opportunities. The results are robust to possible endogeneity concerns, alternative econometric approaches, and measures.

We contribute to the international entrepreneurship literature (Cumming et al., 2009; Schwens et al., 2018) and add to a dearth of research that has examined exporting start-ups' reduction of their international footprint by completely withdrawing from exporting. Moreover, prior research in business and entrepreneurship has often portrayed debt as homogenous. While some scholars have started to examine the implications of debt heterogeneity (i.e., private loans versus public debt) on public firms' R&D investments (e.g., David, et al., 2008) or diversification performance (O'Brien et al., 2014), to our knowledge, we are the first to study the implications of debt heterogeneity for start-ups' exporting (withdrawal) behavior. This focus is important because debt is the most important external financing source for start-ups (e.g., Cassar, 2004; Deloof and Vanacker, 2018; Robb and Robinson, 2014).

Relatedly, existing theoretical explanations on export withdrawal are focused on constrained access to resources and/or weak financial health (e.g., Görg and Spaliara, 2018; Kafouros et al., 2022). Certainly, these factors matter for start-ups' likelihood to withdraw from exporting but our study brings a more nuanced view. For example, controlling for leverage (i.e., access to debt) and firm performance, we show that start-ups with more financial slack resources (i.e., those that are *less* likely to experience resource constraints or weak financial health) do not universally exhibit lower probabilities to withdraw from exporting. Rather, especially start-ups with extreme debt maturity structures (i.e., either mainly short-term debt or mainly long-term debt) and low financial slack have a higher likelihood to stop exporting, relative to firms with more financial slack. But, start-ups with low financial slack and an optimal debt maturity can have a lower likelihood to withdraw from exporting, relative to firms with high financial slack (see Figure

2). Taken together, export withdrawal is explained by more than start-ups' constrained access to resources and/or weak financial health. Indeed, our study highlights that the structure of their resource base (i.e., the debt maturity structure) also matters significantly.

2. Method

2.1 Data sources and sample

Two unique data sources are used for this study: (1) the confidential foreign trade database of the National Bank of Belgium (NBB) and (2) the annual accounts database from the Central Balance Sheet Office at the NBB. The first data source includes longitudinal data on Belgian firms' export sales. This data source allows us to categorize non-exporting firms, exporting firms, and firms that start or stop exporting. The second data source includes detailed yearly financial account data. Belgian regulations require *each* firm registered in the country (operating with limited liabilities of shareholders) to file its annual accounts in a predefined format with the NBB. This format includes about 25 pages of data, even for the smallest and youngest firms. Both data sources are used in previous studies, however, in another context (e.g., Dhyne et al., 2021; Muûls and Pisu, 2009)

We used the following criteria to construct our sample. First, we selected privately held start-ups that were legally founded between 2006 and 2011, and tracked their export activities from inception until 2014.[1] All the start-ups in our sample are small and medium-sized enterprises (SMEs) according to the EU methodology for defining SMEs, which are firms employing less than 250 FTE employees and reporting annual turnover less than 50 million euros (and/or annual balance sheet total less than 43 million euros) (European Commission, 2015). Second, we follow

[1] Firms report customs data (for the extra-EU trade) for all transactions whose value is higher than 1,000 euro. Firms report intra-EU trade by participating in the Intrastat inquiry of the National Bank of Belgium. The participation in the Intrastat inquiry is determined by a threshold for exports. Before 2005, firms that had exported at least 250,000 euro in a given year had to report their export transactions. From 2006 onwards, the threshold for exports was raised to 1,000,000 euro. Firms below the threshold may participate but are not required to do so. To limit the effects of the threshold change on our results, we focus on financial accounts from 2006 onwards.

prior scholars (e.g., Criaco et al., 2022; Patel et al., 2018) and excluded firms controlled by an external shareholder with an equity stake of over 50%. Third, we also excluded utility firms, financial services firms, and government/public sector, education, public health and social sector because their financial data are usually subject to specific restrictions (Barth et al., 2004). Fourth, we excluded start-ups that started exporting more than once during the observation period. As such, we avoid firms that re-enter the exporting market quickly so that we can actually study the decision to cease all exporting activities. This exclusion criterion implied that we deleted firms that, for instance, reported export sales in t-1, no export sales in t, and again export sales in year t+1. After this set of filters, we obtain a database of 23,008 start-ups, including 1,486 exporting start-ups (6.5%) and 21,522 non-exporting firms (94%), representing 70,610 firm-year observations. This database is used to test for potential sample selection bias (see below). However, it does not represent our final sample.

For our final sample, given our focus on export withdrawal, firms obviously first need to export and, hence, we start to work further with the 1,486 exporting start-ups. Accordingly, all firms that never report foreign sales during the study period (2006-2014) are removed. In other words, the final sample only includes observations of start-ups that have started export activities. Moreover, as we focus on the decision to stop exporting, we only retain the firm-year observations from the start of exporting until the time the firm ceases its export activities (or the end of our study's timeframe for those start-ups that remain exporters).[2] The sample is also limited to the observations for which all variables are defined. Based on the above criteria, the final sample includes 1,142 exporting start-ups, representing 2,211 firm-year observations.

[2] Note that we have more firm-year observations available for these start-ups than used in the final sample. However, as we focus on export withdrawal, we only retain observations for firms that are exporting and hence can withdraw from it. Moreover, once start-ups have *completely* withdrawn from exporting, the firm is also dropped from the sample (we know that firms have completely withdrawn because we also have data on these firms after making that decision).

The exporting start-ups are mainly active in the following industries: wholesale trade, except motor vehicles and motorcycles (37.18%), wholesale and retail trade and repair of motor vehicles and motorcycles (13.89%), and retail trade, except motor vehicles and motorcycles (13.39%) and export to 6 countries on average. 516 (45.18%) of these 1,142 exporting firms eventually exited from foreign export markets[3], which underscores the need to understand why start-ups withdraw from exporting.

2.2 Dependent variable

Following prior research (Choquette, 2019; Sui et al., 2019), we examine start-ups' exit from the entire export market. Therefore, the dependent variable *complete export withdrawal* is measured as a dummy variable equal to 1 if a firm exits from foreign export markets (i.e., no longer reports export sales) in year t + 1, given that the firm exported and thus generated foreign export sales until time and equals zero otherwise.

2.3 Independent variable

Consistent with prior research, the independent variable *debt maturity* is measured as the ratio of long-term debt (i.e., debt with a maturity of more than one year) to total debt (Lopez-Gracia and Mestre-Barberá, 2015; Scherr and Hulburt, 2001).[4] Given the hypothesized U-shaped relationship between debt maturity and complete export withdrawal, we further added *debt maturity squared* to capture such potential curvilinear effects.

[3] Looking at firm-year observations, the frequency of export withdrawal drops to 23% as firms are included in the sample from the start of their of exporting activities until they withdraw.

[4] The part of total debt that is not long-term debt is, by definition, short-term debt that matures in less than one year. Obviously, measuring debt maturity as short-term debt on total debt (Brav, 2009) leads to similar findings.

2.4 Moderators

We are interested in the moderating effects of financial slack and growth opportunities on the relationship between debt maturity and complete export withdrawal. We included cash holdings as a measure of *financial slack* defined as the ratio of cash and cash equivalents available within a firm, scaled by total assets (Kim and Bettis, 2014; Paeleman and Vanacker, 2015; Vanacker et al., 2013).[5] Higher values indicate more slack. Given the industry-specific needs for a certain level of financial slack to sustain daily operations, all models include industry fixed effects (Malen and Vaaler, 2017). As scholars provide theoretical and empirical evidence of nonlinear effects of financial slack on firms' export behaviors (Kiss et al., 2018; Paeleman et al., 2017), we also included *financial slack squared* measured as cash holdings squared.

Next, we included *growth opportunities*. Previous studies on listed firms generally use Tobin's Q as a proxy for growth opportunities. However, this study uses a sample of privately held start-ups. Therefore, following prior studies, we measured growth opportunities by past growth in total assets (e.g., Heyman et al., 2008; Scherr and Hulburt, 2001). The idea is that past growth is a proxy for future growth opportunities. More specifically, we included the ratio of total assets in year t scaled by total assets in year t – 1 as a proxy for growth opportunities. One might wonder why we do not resort to sales growth, but the problem is that small firms are not required to report their total sales in the Belgian context; and accordingly, we decide to retain measures used in prior research, which also entails empirical consistency with such work (e.g., Heyman et al., 2008). In the robustness section, we discuss an alternative proxy, namely capital expenditures (or investments made to sustain or increase growth).

[5] Adjusting cash holdings for sub-industry norms by subtracting the median ratio of cash and cash equivalents to total assets for all firms operating in the same four-digit NACE industry and year as the focal firm (Bromiley, 1991) resulted in identical findings. However, we do not report these findings, because our inclusion of industry dummies essentially already removes any variance at the industry level.

We follow the two approaches that are generally used to assess moderation effects: (1) using interaction terms or (2) creating subsample splits based on the means of the moderator variables (e.g., Jaccard et al., 1990). First, we estimate models including interaction effects between the independent variables debt maturity and debt maturity squared and the moderators financial slack (Hypothesis 2) and growth opportunities (Hypothesis 3).[6] We use a graphical approach to facilitate the interpretation of these interaction effects. Second, we consider a sample split between firms holding financial slack above and below the mean, and a sample split of firms with growth opportunities above and below the mean.[7] This approach avoids the interpretation of interaction terms in nonlinear regressions, which is often complicated (Salomon and Jin, 2010).

2.5 Control variables

We included several control variables that previous research has shown to be important when studying firms' exporting behavior (e.g., Paeleman et al., 2017; Sui et al., 2019) and survival (e.g., Freixanet and Renart, 2020). We include *firm size* as the natural logarithm of total assets (Cassar, 2004)[8] and *firm age* as the natural logarithm of the years since legal incorporation.

Exporting could also be affected by the external financing secured (e.g., Paeleman et al., 2017; St-Pierre et al., 2018). We, therefore, included *leverage* measured as total debt scaled by total assets (Brav, 2009; Heyman et al., 2008; Rajan and Zingales, 1995).[9] To capture possible nonlinear effects of firm leverage, we also included *leverage squared*.

[6] When we also included the interactions between debt maturity and financial slack squared and debt maturity squared with financial slack squared, these more complex interactions are not significant. Therefore, we report the more parsimonious regression models.
[7] Qualitatively similar results were obtained when we conducted the subsample splits at the median.
[8] Results are robust when measuring firm size by the natural logarithm of the number of employees. Although export sales data is available for most firms, only large Belgian firms are required to report their total sales figures. Therefore, using total sales as a measure would lead to a bias in that we would only include the larger firms.
[9] We used total debt instead of total liabilities as Rajan and Zingales (1995: 1428) noted "since total liabilities also includes items like accounts payable, which may be used for transactions purposes rather than for financing, it may overstate the amount of leverage".

We further controlled for *intangibility* measured as the ratio of intangible assets (e.g., the book value of patents, trademarks, and brands) to total assets (Paeleman and Vanacker, 2015). By virtue of their inherent inimitability, these resources may foster a competitive advantage (Newbert, 2007) but are also known to have more limited collateral value (Walthoff-Borm et al., 2018).

Because better-performing firms have all else equal more internal funds, firm performance can affect firms' exporting behavior (e.g., Hitt et al., 2006) and survival (e.g., Deloof and Vanacker, 2018). Thus, we include firm *performance*, operationalized as operating profit/loss on total assets.

In Belgium, during the timeframe of our study, start-ups could choose among several legal forms with NVs and BVBAs being the most common legal forms (Deloof and Vanacker, 2018). Compared to start-ups that are BVBAs, start-ups that are NVs face higher equity requirements and can not only issue registered shares but also bearer shares (which can be transferred without any restrictions) (e.g., Huyghebaert et al., 2007). Therefore, we included a dummy variable *legal form* that equals one if the firm is founded as an NV limited liability firm, and zero otherwise.

We further included the *number of competitors* measured as the natural logarithm of the number of firms competing in the same 4-digit NACE industry as the focal firm. Next, as inward internationalization strategies such as import activities are linked to exporting (Bas and Strauss-Kahn, 2014; Muûls and Pisu, 2009) and export withdrawal (Choquette, 2019), we controlled for *import activities* by including a dummy variable that equals one if the firm has import sales, and zero otherwise. Following Sui et al. (2019), we also included the *number of export destinations* measured as the natural logarithm of the number of countries to which a firm exported in the focal year.

In all models, we further controlled for *year fixed effects* and *industry fixed effects* (37 industry level dummy variables based on two-digit NACE codes).[10] These fixed effects control for remaining variance in industry and macro-economic conditions.

2.6 Econometric approach

As we use a longitudinal dataset, we need to consider possible correlations between observations from the same firm when estimating regression parameters. We employ the generalized estimating equation (GEE) technique to estimate efficient and unbiased regression parameters for longitudinal data (for a detailed discussion, we refer to Ballinger (2004)). By specifying a working correlation matrix, the GEE approach accounts for unobserved heterogeneity across firms and the lack of independence across observations for the same firm. We chose a binomial distribution and a cloglog link function. The complementary log-log model has the advantage of providing close similarity to continuous time models, such as the Cox regression model (Allison, 2010). However, Allison (2010: 416) highlights "[i]f you know the exact times at which events occur, it is appropriate to use methods that treat time as continuous. If, on the other hand, you know only the month or the year of the event, you might be better off using discrete-time methods". Thus, as we only have yearly data, we use discrete-time GEE models. We further used an unstructured correlation matrix option. This correlation matrix option with robust variance estimators provides conservative results (Liang and Zeger, 1986). We run the analyses with the dependent variable complete export withdrawal, which equals one if a firm realizes no export sales in foreign markets in year t + 1. All independent and control variables are measured in year t.

Sample selection. To study complete export withdrawal, we focus on those start-ups with foreign sales (i.e., exporting start-ups). However, there is a possibility that these exporting start-

[10] Including year and industry fixed effects is equivalent to demeaning all of the dependent and independent variables with respect to the year and industry group mean (Gormley and Matsa, 2014).

ups are not a random subset of all firms but have certain characteristics that are also linked to start-ups' exporting behavior and complete export withdrawal and thus have to be taken into account (Ganotakis and Love, 2012). Therefore, using the full sample of both exporters and non-exporters from the NBB, we used Heckman's (1979) two-step procedure to control for potential sample selection bias and the possibility that entry into exporting is not a random choice (e.g., Sui and Baum, 2014; Sui et al., 2019; Terjesen et al., 2016).

More specifically, we first predict the probability that firms enter into exporting by using a probit model and then control for that decision in second-stage regressions (Ganotakis and Love, 2012).[11] Exporting was measured as a dummy variable equal to one if a firm has foreign sales in year t, and zero otherwise. Following other scholars (e.g., Zahra et al., 1997), we used the following control variables: debt maturity, debt maturity squared, financial slack, financial slack squared, growth opportunities, firm size, firm age, leverage, leverage squared, intangibility, performance, legal form, number of competitors, import activities, and industry and year dummies. Following previous work (Patel et al., 2018; Paeleman et al., 2017), the selection equation also includes two variables (i.e., industry mimetic export behavior and the lagged decision to export) that are likely to act as good instruments. Scholars have shown that the global expansion strategy of a firm can be mimetically affected by those of related firms within the same industry (e.g., Guillén, 2002; Henisz and Delios, 2001) but that, theoretically, pursuing mimetic global expansion is not likely to influence firm performance and survival directly (Kim et al., 2015). Industry mimetic export behavior is measured as the average export intensity of the industry at NACE 4-digit level. Further, the lagged decision to export can also function as an instrumental variable because the variable is not relevant in the second-stage analysis as all firms have already decided to export. To minimize

[11] The results from a linear probability model are similar to those from a probit model.

concerns about reverse causality, we measure the probability of exporting at time t and the predictor variables at t-1. We then use this predicted probability of exporting that results from the first-stage models to create an inverse Mills ratio that we add as an endogeneity correction in the second-stage GEE regressions (Hamilton and Nickerson, 2003).

3. Results

Table 1 gives the descriptive statistics for all variables (except for industry and year dummies) and shows the tests on whether the means differ between exporting start-ups that do not withdraw (Panel B) and exporting start-ups that completely withdraw (Panel C). Appendix 2 presents the correlations between all variables used in the analyses. The fact that none of the Variance Inflation Factors (VIFs) were above 2.86 minimized concerns of multicollinearity.

Table 1. Descriptive statistics.

		Panel A All exporting firms					
		N	Mean	S.D.	Min	Median	Max
1	Complete export withdrawal	2,211	0.233	0.423	0.000	0.000	1.000
2	Debt maturity	2,211	0.643	0.408	0.000	0.887	1.000
3	Financial slack	2,211	0.106	0.128	0.000	0.056	0.872
4	Growth opportunities	2,211	1.147	0.555	0.211	1.034	6.461
5	Firm size[a]	2,211	3,606,779	7,495,866	7,580	1,195,008	113,000,000
6	Firm age[a]	2,211	4.230	1.369	2.000	4.000	7.000
7	Leverage	2,211	0.307	0.255	0.000	0.252	1.207
8	Intangibility	2,211	0.034	0.095	0.000	0.000	0.763
9	Performance	2,211	0.029	0.228	-2.257	0.044	0.725
10	Legal form	2,211	0.347	0.476	0.000	0.000	1.000
11	Number of competitors[a]	2,211	1,253.097	1,687.574	5.000	607.000	21,651.000
12	Import activities	2,211	0.682	0.466	0.000	1.000	1.000
13	Number of export destinations[a]	2,211	6.172	9.203	1.000	3.000	88.000

		Panel B Exporting firms that *not withdraw*			Panel C Exporting firms that *completely withdraw*			T-tests (mean)
		N	Mean	S.D.	N	Mean	S.D.	Diff. (p-value)
1	Complete export withdrawal	1,695	0.000	0.000	516	1.000	0.000	-
2	Debt maturity	1,695	0.634	0.410	516	0.674	0.404	0.048
3	Financial slack	1,695	0.106	0.129	516	0.103	0.125	0.542
4	Growth opportunities	1,695	1.160	0.554	516	1.106	0.555	0.053
5	Firm size[a]	1,695	4,003,003	7,870,771	516	2,305,230	5,927,328	0.000
6	Firm age[a]	1,695	4.240	1.383	516	4.198	1.320	0.538
7	Leverage	1,695	0.293	0.244	516	0.352	0.282	0.000
8	Intangibility	1,695	0.032	0.093	516	0.040	0.102	0.077
9	Performance	1,695	0.043	0.187	516	-0.019	0.323	0.000
10	Legal form	1,695	0.377	0.485	516	0.248	0.432	0.000
11	Number of competitors[a]	1,695	1,121.986	1,487.599	516	1,683.779	2,167.852	0.000
12	Import activities	1,695	0.738	0.440	516	0.500	0.500	0.000
13	Number of export destinations[a]	1,695	7.228	9.781	516	2.703	5.750	0.000

Note: The descriptive statistics of the untransformed variables are reported here. [a] The natural logarithm of the variables is used for the correlations and multivariate regressions reported in the tables below.

Table 2, Model 1, reports the results of the first-stage (selection) regression model predicting the decision to export. The results also show that growth opportunities, firm size, legal form, import activities, the lagged decision to export and industry mimetic export behavior have a positive effect on the probability to export, while firm age, leverage, intangibility and the number of competitors have a negative effect.

Table 2. Probit model (Model 1) predicting the probability to export (sample selection) and GEE models (Models 2 and 3) predicting complete export withdrawal (Hypothesis 1).

Variables	**Probability to export**	**Complete export withdrawal**	
	Model 1	Model 2	Model 3
Debt maturity	0.007	-	-1.298**
	(0.189)		(0.624)
Debt maturity squared	-0.134	-	1.053*
	(0.175)		(0.572)
Financial slack	0.157	-0.946	-0.989
	(0.256)	(0.982)	(1.015)
Financial slack squared	-0.461	0.691	0.733
	(0.452)	(2.032)	(2.098)
Growth opportunities	0.075***	-0.222**	-0.223**
	(0.015)	(0.104)	(0.103)
Firm size	0.137***	-0.021	-0.004
	(0.013)	(0.047)	(0.047)
Firm age	-0.176***	0.144	0.139
	(0.056)	(0.205)	(0.207)
Leverage	-0.532***	-0.033	0.108
	(0.160)	(0.502)	(0.503)
Leverage squared	0.245	0.270	0.168
	(0.177)	(0.469)	(0.467)
Intangibility	-0.244*	0.148	0.098
	(0.127)	(0.489)	(0.502)
Performance	-0.009	-0.774***	-0.761***
	(0.072)	(0.194)	(0.195)
Legal form	0.068*	-0.031	-0.067
	(0.041)	(0.135)	(0.138)
Number of competitors	-0.051***	0.019	0.009
	(0.014)	(0.054)	(0.053)
Import activities	0.640***	-0.271**	-0.266**
	(0.033)	(0.112)	(0.111)
Industry mimetic export behavior	1.340***	-	-
	(0.280)		
Lagged decision to export	2.488***	-	-
	(0.040)		
Number of export destinations	-	-0.787***	-0.801***
		(0.113)	(0.113)
Inverse Mills ratio	-	0.557***	0.571***
		(0.062)	(0.063)
Constant	-3.308***	-1.100	-1.076
	(0.217)	(0.882)	(0.877)
Industry fixed effects?	YES	YES	YES
Year fixed effects?	YES	YES	YES
Number of observations	70,610	2,211	2,211
Number of firms	23,008	1,142	1,142
Log Likelihood	-4,457		
Wald chi-square		514.74***	520.56***

Note: Two-tailed tests, where * p<0.10, ** p<0.05, *** p<0.01. Unstandardized regression coefficients are reported. Robust (Model 1) and semi-robust (Model 2 and 3) standard errors are in parentheses.

Further, in Table 2, models 2 and 3 report the GEE discrete-time estimation results of the second-stage regression models predicting complete export withdrawal *after controlling for the non-random export decision*. Model 2 presents the model related to complete export withdrawal with the controls only. The higher a firm's growth opportunities, performance, import activities and the number of export destinations, the less likely start-ups in our sample will withdraw from foreign export markets. The Inverse Mills ratio is also highly statistically significant, which supports the notion of controlling for the selection issue.

Model 3 adds the variables of interest, i.e., debt maturity and debt maturity squared. Hypothesis 1 stated that the relationship between debt maturity and the probability of complete export withdrawal by start-ups is U-shaped. Model 3 reports a negative and significant coefficient for debt maturity ($\beta = -1.298$, $p < 0.05$) and a positive and significant coefficient for debt maturity squared ($\beta = 1.053$, $p < 0.10$), thereby supporting the U-shaped relationship in Hypothesis 1. A graphical visualization of this effect is shown in Figure 1. When all other variables are held at their means, moving from low debt maturity (mean – 1 S. D.) to mean debt maturity, firms have a 15.6% versus 13.5% probability to completely withdraw their export activities (this represents a drop of about 13%). Moreover, moving from mean debt maturity to high debt maturity (maximum value of 1), firms have a 13.5% versus 15.6% probability to completely withdraw their export activities (this represents an increase of about 17%). These findings are economically meaningful. Taken together, our results support Hypothesis 1.

Figure 1: The relationship between debt maturity and the probability of complete export withdrawal (Hypothesis 1).

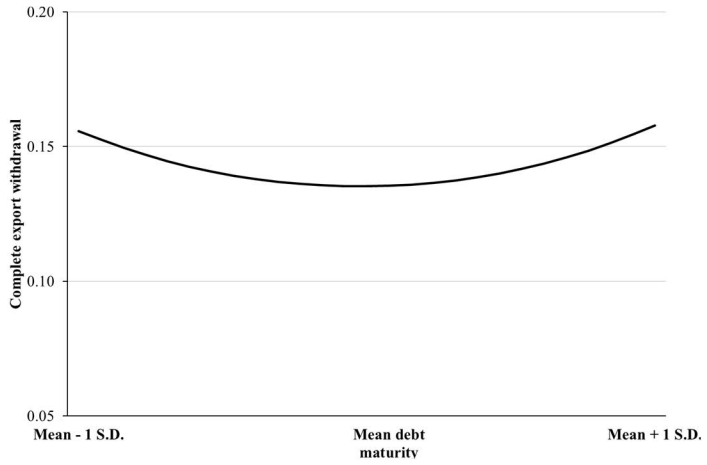


Table 3 reports the GEE discrete-time estimation results of the second-stage regression models testing the moderating effects of financial slack and growth opportunities, respectively, on complete export withdrawal. To test the moderating effect of financial slack, we first included in Table 3, Model 1, the controls, the main effects of debt maturity and its squared term, the main effects of financial slack and its squared term, and the two-way interactions of debt maturity and debt maturity squared with financial slack, respectively. Additionally, we report the results for the mean split, with exporting start-ups with low levels of financial slack in Model 2 and exporting start-ups with high levels of financial slack in Model 3.

Table 3. GEE models predicting complete export withdrawal (Hypothesis 2 and 3).

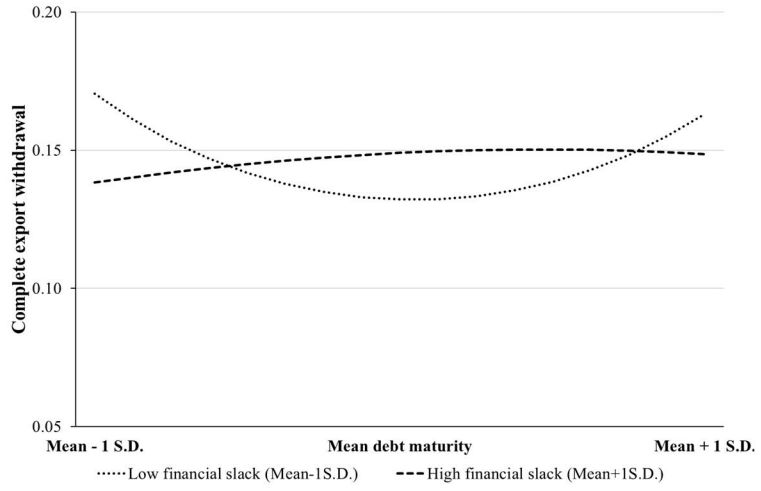
	Complete export withdrawal					
Variables	All exporting start-ups	Exporting start-ups with low financial slack	Exporting start-ups with high financial slack	All exporting start-ups	Exporting start-ups with low growth opportunities	Exporting start-ups with high growth opportunities
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Debt maturity	-2.062***	-1.648**	1.652	1.950	-0.256	-2.945**
	(0.760)	(0.713)	(1.540)	(1.605)	(0.780)	(1.147)
Debt maturity squared	1.577**	1.354**	-1.490	-1.495	0.099	2.501**
	(0.713)	(0.656)	(1.353)	(1.551)	(0.711)	(1.057)
Financial slack	-3.092**	-5.941	0.865	-1.023	-2.705**	2.349
	(1.307)	(6.593)	(2.771)	(0.994)	(1.188)	(1.629)
Financial slack squared	0.190	56.255	-1.633	0.798	4.030*	-5.358*
	(2.001)	(70.301)	(4.149)	(2.026)	(2.387)	(2.792)
Growth opportunities	-0.226**	-0.168	-0.328**	0.249**	-0.246	-0.105
	(0.100)	(0.116)	(0.166)	(0.122)	(0.359)	(0.139)
Debt maturity x Financial slack	10.671*	-	-	-	-	-
	(5.449)					
Debt maturity squared x financial slack	-7.872	-	-	-	-	-
	(5.045)					
Debt maturity x Growth opportunities		-	-	-2.881**	-	-
				(1.318)		
Debt maturity squared x Growth opportunities	-	-	-	2.261*	-	-
				(1.289)		
Firm size	-0.007	-0.047	0.048	-0.001	-0.059	0.061
	(0.048)	(0.057)	(0.098)	(0.048)	(0.059)	(0.081)
Firm age	0.139	0.162	-0.128	0.134	0.143	-0.122
	(0.206)	(0.254)	(0.374)	(0.207)	(0.242)	(0.404)
Leverage	0.144	0.177	-0.389	-0.015	-0.488	1.328
	(0.499)	(0.610)	(1.011)	(0.505)	(0.600)	(1.067)
Leverage squared	0.172	0.139	0.947	0.288	0.546	-0.194
	(0.459)	(0.560)	(1.016)	(0.472)	(0.539)	(1.165)
Intangibility	0.096	-0.017	-0.425	0.069	0.228	-0.040
	(0.502)	(0.649)	(1.141)	(0.499)	(0.559)	(1.084)
Performance	-0.794***	-0.497*	-0.954***	-0.816***	-0.579**	-0.805*
	(0.190)	(0.288)	(0.318)	(0.202)	(0.253)	(0.438)
Legal form	-0.065	-0.114	0.098	-0.082	-0.042	0.014
	(0.139)	(0.178)	(0.255)	(0.139)	(0.168)	(0.260)
Number of competitors	0.006	0.074	-0.171	0.008	0.038	-0.105
	(0.053)	(0.066)	(0.114)	(0.054)	(0.068)	(0.093)
Import activities	-0.270**	-0.259*	-0.223	-0.259**	-0.048	-0.611***
	(0.111)	(0.138)	(0.206)	(0.112)	(0.138)	(0.193)
Number of export destinations	-0.807***	-0.876***	-0.597**	-0.787***	-0.806***	-0.839***
	(0.114)	(0.135)	(0.234)	(0.113)	(0.135)	(0.202)
Inverse Mills ratio	0.574***	0.466***	0.856***	0.586***	0.643***	0.459***
	(0.063)	(0.073)	(0.132)	(0.063)	(0.075)	(0.114)
Constant	-0.808	-0.334	-2.972	-1.731*	-0.285	-2.173
	(0.885)	(1.061)	(1.893)	(0.888)	(1.095)	(1.676)
Industry fixed effects?	YES	YES	YES	YES	YES	YES
Year fixed effects?	YES	YES	YES	YES	YES	YES

Number of observations	2,211	1,463	704	2,211	1,475	681
Number of firms	1,142	822	451	1,142	892	507
Wald chi-square	521.06***	267.43***	254.83***	536.41***	393.57***	336.98***

Note: Two-tailed tests, where * p<0.10, ** p<0.05, *** p<0.01. Unstandardized regression coefficients are reported. Semi-robust standard errors are in parentheses. The sum of the number of observations of the sample split models (Model 2 and Model 3; Model 5 and 6) differs from the total number of observations of our full sample (Model 1; Model 4) due to perfect prediction.

Hypothesis 2 stated that the U-shaped relationship between debt maturity and the probability of complete export withdrawal by start-ups is weaker for firms with high levels of financial slack compared to firms with low levels of financial slack. Model 1 reports a positive and significant ($\beta = 10.671$, $p < 0.10$) linear interaction term between debt maturity and financial slack, and a negative but insignificant ($\beta = -7.872$, $p = 0.119$) quadratic interaction term on the full sample of all exporting start-ups. To facilitate interpretation, we also plotted the interaction terms from Model 1 in Figure 2. While the relationship between debt maturity and the probability of complete export withdrawal is a U-shaped relationship for firms with limited financial slack, there is a positive relationship at a diminishing rate for firms with high levels of financial slack. These findings support Hypothesis 2.

Figure 2: Moderating effect of financial slack on the relationship between debt maturity and the probability of complete export withdrawal (Hypothesis 2).

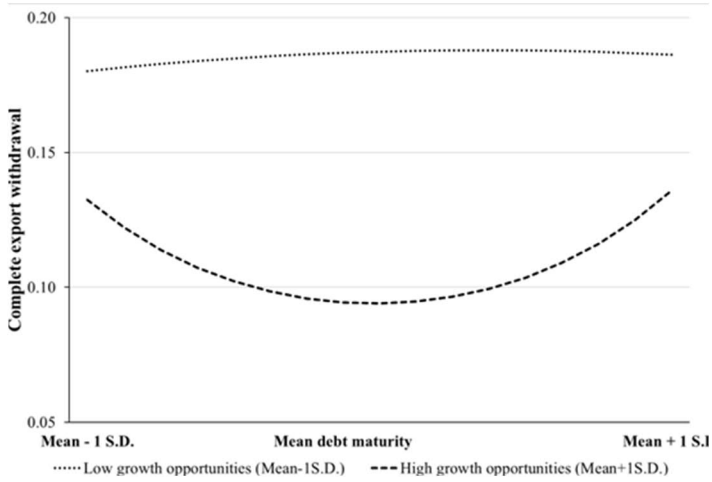


We also split the dataset of all exporting start-ups along the mean value of our financial slack measurement. We then estimate the debt maturity and debt maturity squared effect separately for these two subsamples. Model 2, including exporting start-ups with low financial slack, reports a negative and significant coefficient for debt maturity ($\beta = -1.648$, $p < 0.05$) and a positive and significant coefficient for debt maturity squared ($\beta = 1.354$, $p < 0.05$). Model 3, including exporting start-ups with high financial slack, reports no significant coefficients for debt maturity and debt maturity squared. These findings are consistent with the insights from Table 3, Model 1, and Figure 2 using interaction terms. Taken together, we find evidence supporting Hypothesis 2.

To test the moderating effect of growth opportunities, we included in Table 3, Model 4, the controls, the main effects of debt maturity and its squared term, the main effect of growth opportunities, and the two-way interactions of debt maturity and debt maturity squared with growth opportunities, respectively. Furthermore, we report the results for a mean split, with exporting start-ups with low growth opportunities in Model 5 and exporting start-ups with high growth opportunities in Model 6.

Hypothesis 3 stated that the U-shaped relationship between debt maturity and the probability of complete export withdrawal by start-ups is stronger for firms with high growth opportunities compared to firms with low growth opportunities. Model 4 reports a negative and significant linear interaction term between debt maturity and growth opportunities ($\beta = -2.881$, $p < 0.05$), and a positive significant quadratic interaction term ($\beta = 2.261$, $p < 0.10$) on the full sample of all exporting start-ups. Figure 3 graphically illustrates the interaction terms. The relationship between debt maturity and the probability of complete export withdrawal shows a much stronger U-shaped relationship for firms with high growth opportunities, relative to firms with low growth opportunities. These findings support Hypothesis 3.

Figure 3: Moderating effect of growth opportunities on the relationship between debt maturity and the probability of complete export withdrawal (Hypothesis 3).



We further split the dataset of all exporting start-ups along the mean value of our growth opportunities measure. We then estimate the debt maturity and debt maturity squared effect separately for these two subsamples. Model 5, including exporting start-ups with low growth opportunities, reports no significant coefficients for debt maturity and debt maturity squared. Model 6, including exporting start-ups with high growth opportunities, reports a negative and significant coefficient for debt maturity ($\beta = -2.945$, $p < 0.05$) and a positive and significant coefficient for debt maturity squared ($\beta = 2.501$, $p < 0.05$). These findings are consistent with the insights from Table 3, Model 1 and Figure 3 using interaction terms. Taken together, we find evidence supporting Hypothesis 3.

4. Robustness tests

We performed additional analyses to assess the robustness of our findings. These tests are described below (detailed results are not reported but available upon request).

Endogeneity. Limited growth opportunities in a firm's export markets may *ex-ante* influence entrepreneurs to adjust debt maturity (so that entrepreneurs first decide to withdraw and

as a consequence adjust their debt maturity in preparation for the actual withdrawal decision). We follow a similar approach as Lang et al. (1996) and Aivazian et al. (2005), who focus on firm investments, to examine this possible endogeneity concern. Specifically, we separate the start-ups for which exporting is core versus non-core: that is, start-ups with a high versus low export intensity (i.e., foreign sales scaled by total sales), and start-ups that are active in a large versus a low number of export destinations. Entrepreneurs are unlikely to ex-ante change their firms' debt maturity because of (limited) growth opportunities in export markets when exporting is not core to the firm; thus, endogeneity is mitigated in the complete export withdrawal decision of non-core exporting firms. The results, however, are consistent among the subsamples of firms with high *and* low export intensity, and firms with a high *and* low number of export destinations. These findings run counter to the above endogeneity explanation.

Alternative samples and method. First, start-ups may not only rely on exporting when penetrating foreign markets. Indeed, some may establish foreign subsidiaries and these start-ups may be more strongly committed to foreign expansion. However, we only have 27 firm-year observations in the sample related to start-ups with foreign subsidiaries. Excluding these firm-year observations does not influence our results. Second, for some firms, complete export withdrawal may coincide with firm failure. To avoid the results being driven by firm closure instead of export market exit decisions, we exclude firms that fail in our sample. The findings remain similar when excluding these firms. Third, we used random effects probit models instead of GEE models. The results are again qualitatively similar to those reported before. Fourth, we checked that the results were robust to control for industry-specific trends by including a set of interactions between two-digit NACE code industry and year dummies (Gormley and Matsa, 2014). Results are qualitatively similar.

Alternative growth opportunity measure. Additionally, we measured growth opportunities by capital investment expenditures as they are made to accommodate expected future growth in the demand for a firm's products and services (Carney and Gedajlovic, 2002; Heyman et al., 2008; Kim and Bettis, 2014). Capital expenditures are investments made to acquire, update, or build tangible fixed assets such as property, plant, and equipment. Hence, we include the ratio of net capital investment expenditures scaled by tangible fixed assets in year t – 1 as an alternative measure of growth opportunities. Results remain similar.

5. Discussion and Conclusion

In this paper, we reframe the debate on whether access to more debt is "good" or "bad" for start-ups' exporting behavior. More specifically, we suggest that next to start-ups' debt positions (i.e., their leverage), it is also important to investigate the structure or composition of their debt positions. Using unique longitudinal data, we studied the impact of start-ups' debt maturity structure (i.e., the short-term/long-term debt mix) on the likelihood of exporting start-ups' complete export withdrawal. We find that there is a U-shaped relationship between debt maturity structure and the likelihood of start-ups' complete export withdrawal: start-ups that are almost fully funded by either short-term debt or long-term debt have a higher export withdrawal likelihood; while there is an optimal, balanced debt maturity structure, which minimizes start-ups complete export withdrawal likelihood. This U-shaped relationship is especially strong for start-ups with limited financial slack and start-ups with significant growth opportunities. Our study makes several important contributions.

5.1 Theoretical contributions

The vast majority of studies in the international entrepreneurship literature have focused on how and why start-ups increase their international footprint, and how they perform conditional upon the selection of an internationalization mode (Cumming et al., 2009; Keupp and Gassmann, 2009; Mudambi and Zahra, 2007; Oviatt and McDougall, 1994; Schwens et al., 2018; Sui and Baum, 2014). While prior studies have examined the de-internationalization process in general and the export withdrawal process in specific, evidence remains scant and scattered (e.g., Kafouros et al., 2022). This limited focus is surprising because past research shows a high drop-out rate from exporting, especially for firms in their early stages of internationalization and small firms (Mudambi and Zahra, 2007). Many exporting start-ups eventually retrench or abandon their export activities. Devoting attention to this withdrawal process—as we do in the current study—is crucial because the factors that influence the decision to pursue a particular strategic course of action, such as start exporting, and the factors that influence the de-commitment from that course of action, such as export withdrawal, can be fundamentally different (e.g., Hayward and Shimizu, 2006). Thus, we cannot simply generalize that what we know from studying start-ups that increase their international footprint will simply be the opposite for start-ups that withdraw from exporting.

Indeed, the decision to export has often been linked to the availability of resources, including debt (e.g., Gashi et al., 2014; Lin et al., 2009; Love and Roper, 2015; Onkelinx et al., 2016a; Park and LiPuma, 2020; Tseng et al., 2007). Conversely, others have argued that limited access to resources, including debt, and related weak financial health explain why firms withdraw from exporting (Görg and Spaliara, 2018; Onkelinx et al., 2016b). Certainly, there is value in this perspective. But, in our study, we have argued and shown that there is more than weak performance (i.e., we control for firm financial performance) and access to debt (i.e., leverage, for which we control as well). We find that even when controlling for these factors, a firm's debt maturity

structure significantly influences a firm's withdrawal decision. Furthermore, our findings are economically significant: relative to start-ups with an optimal debt maturity structure, firms with extreme debt maturity structures have an approximately 15% greater likelihood to withdraw from exporting. In addition, the interaction effects between debt maturity and growth opportunities, for example, show that firms with significant growth opportunities are not all equally likely to remain active exporters. Even firms with high growth opportunities can have much higher (lower) likelihood of withdrawing from exporting based on their debt maturity structure (e.g., Figure 3).

This paper links the international entrepreneurship literature with the entrepreneurial finance literature. To our knowledge, there is no research on the link between a start-up's debt structure (next to its level of debt) and its exporting behavior. This situation is unfortunate because debt is the major source of financing for start-ups (see, Cassar, 2004; Cosh et al., 2009; Deloof and Vanacker, 2018). We have only started to skim the surface on the importance of debt in start-ups (e.g., Hanssens et al., 2016) and, in particular, how debt affects start-ups' exporting behavior. Moreover, in the international entrepreneurship literature, debt has often been depicted as homogenous. We provide new insights into the role of debt heterogeneity for start-ups' export withdrawal. Specifically, controlling for the level of debt a start-up raised, extreme debt maturity structure positions (e.g., only raising short-term debt or only raising long-term debt) increases the likelihood that firms exit the export market due to liquidity risk and higher costs, respectively. There is an optimal level of debt maturity where firms combine short-term debt and long-term debt. Accordingly, there is a U-shaped relationship between debt maturity and start-up export withdrawal. Moreover, in line with the proposed mechanisms for this U-shape (i.e., liquidity risk and the higher costs), we coherently report stronger U-shaped relationships for firms where the mechanisms are a priori expected to be more acute: start-ups with low levels of financial slack and start-ups with high growth opportunities.

5.2 Limitations and avenues for future research

As with any study, this paper has some limitations that provide interesting avenues for future research. First, we focused on one specific structural element of a firm's debt, namely its debt maturity or the relative importance of long-term (or short-term debt) in a firm's overall debt position. Debt maturity is generally considered to be a very important dimension just like the level of debt (e.g., Degryse et al., 2012; Brav, 2009; Heyman et al., 2008). However, other scholars have pointed towards other structural elements of a firm's debt, such as debt specialization (i.e., whether debt comes from one specific source or multiple sources, such as banks, leasing, bonds, …) (e.g., Colla et al., 2013) or private versus public debt (e.g., David et al., 2008). For start-ups, however, public debt is not available. Hence, future research can examine a broader set of structural elements related to firms' debt positions and their export behaviors, both for start-ups and established firms.

It would be interesting for future studies to exploit environmental jolts, such as the COVID-19 pandemic (e.g., Zahra, 2021), and their impact on exporting start-ups' international footprint. While exporting start-ups have witnessed dramatic shocks in most of their exporting markets, they have often also received significant government support. Increasing our understanding of how these factors influence start-ups' international activities is central.

Finally, our study focuses on Belgian start-ups. The advantage of the Belgian context is that we had access to unique data on start-ups' exporting activities and their financial accounts. The details of the data for such early-stage firms are rather unique (e.g., Robb and Robinson, 2014). However, a focus on Belgium limits the external validity of the findings to other countries, and especially less export-oriented economies. If future research could examine how conditions in exporting start-ups' home country may force or push them to withdraw from exporting, such an institution-based view could further increase our understanding of the export withdrawal process (e.g., Jafari-Sadeghi et al., 2022).

5.3 Practical implications

Our findings provide insights to entrepreneurs with exporting ambitions. We highlight that leverage has a negative effect on the decision to start exporting, which confirms the need for flexibility to swiftly react to exporting opportunities. Interestingly, once start-ups become exporters, we fail to find an effect of leverage on the likelihood to withdraw completely from exporting. However, the results do suggest that it remains important for entrepreneurs to maintain a balanced debt maturity structure. Combined, our findings suggest that entrepreneurs should balance not only the advantages and disadvantages of attracting debt for their international ambitions, but also consider the maturity structure of their debt position and thus weigh the advantages and disadvantages of short-term versus long-term debt. Furthermore, our findings stress the importance of financial slack and growth opportunities with respect to sustaining exporting activities.

As Bernard and Jensen (2004: 561) argue, policy-makers "are convinced that helping exporters is a no-lose issue. The argument […] goes as follows: exports are good, and exporters are good firms; thus helping domestic firms export is good policy". Indeed, policy-makers have set up dedicated centers that provide start-ups with advice and access to loans, insurance and grant programs to foster exports. Our study suggests that while access to large amounts of credit can be important for pushing firms to become exporters, the characteristics of an additional loan that moves firms' debt maturity structure away from the optimal can foster subsequent export withdrawal.

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Appendix 1. Construction of the variables.

Variables	**Measurement**
Complete export withdrawal	Dummy variable equal to 1 if a firm exits from foreign export markets (i.e., no longer reports export sales) in year t + 1, given that the firm exported and thus generated foreign export sales until time t, and equals zero otherwise
Debt maturity	Ratio of long-term debt (i.e., debt with a maturity of more than one year) to total debt *NBB codes: [1704 / (1704 + 43)]*
Financial slack	Ratio of cash and cash equivalents available within a firm, scaled by total assets *NBB codes: [(5053 + 5458) / 2058]*
Growth opportunities	Ratio of total assets in year t scaled by total assets in year t – 1 *NBB codes: [*2058 in t / 2058 in t-1]
Firm size	Natural logarithm of total assets
Firm age	Natural logarithm of the years since legal incorporation
Leverage	Total debt scaled by total assets *NBB codes: [(1704 + 43) / 2058]*
Intangibility	Ratio of intangible assets (e.g., the book value of patents, trademarks, and brands) to total assets *NBB codes: [21 / 2058]*
Performance	Operating profit/loss on total assets *NBB codes: [9901 / 2058]*
Legal form	Dummy equals one if the firm is founded as an NV limited liability firm, and zero otherwise
Number of competitors	Natural logarithm of the number of firms competing in the same 4-digit NACE industry as the focal firm
Import activities	Dummy variable that equals one if the firm has import sales, and zero otherwise
Industry mimetic export behavior	The average export intensity of the industry at NACE 4-digit level
Lagged decision to export	Dummy variable that equals one if the firm reports foreign sales in t-1, and zero otherwise
Number of export destinations	Natural logarithm of the number of countries to which a firm exported in the focal year

Appendix 2. Correlation matrix of variables used in our analyses.

Panel A: All exporting firms

		N	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Complete export withdrawal	2,211	1.00												
2	Debt maturity	2,211	**0.04**	1.00											
3	Financial slack	2,211	-0.01	**0.16**	1.00										
4	Growth opportunities	2,211	-0.04	0.01	**0.05**	1.00									
5	Firm size[a]	2,211	**-0.21**	**-0.09**	**-0.15**	**0.07**	1.00								
6	Firm age[a]	2,211	-0.01	0.01	0.00	-0.02	0.03	1.00							
7	Leverage	2,211	**0.10**	**-0.05**	**-0.21**	**-0.11**	0.03	0.00	1.00						
8	Intangibility	2,211	0.04	0.01	**-0.05**	-0.03	-0.03	**-0.05**	**0.06**	1.00					
9	Performance	2,211	**-0.12**	0.04	**0.08**	**0.13**	**0.05**	0.03	**-0.29**	**-0.12**	1.00				
10	Legal form	2,211	**-0.11**	**-0.16**	0.01	-0.02	**0.47**	-0.04	0.01	**0.10**	**-0.16**	1.00			
11	Number of competitors[a]	2,211	**0.13**	-0.01	0.01	0.00	**-0.19**	0.00	-0.03	-0.04	**0.06**	**-0.22**	1.00		
12	Import activities	2,211	**-0.22**	**-0.08**	0.02	0.00	**0.35**	0.03	-0.04	-0.02	-0.01	**0.21**	**-0.17**	1.00	
13	Number of export destinations[a]	2,211	**-0.34**	**-0.20**	-0.04	-0.01	**0.40**	0.02	**-0.10**	-0.01	**0.06**	**0.25**	**-0.15**	**0.29**	1.00

Panel B: Exporting firms that not withdraw

		N	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Complete export withdrawal	1,695	-												
2	Debt maturity	1,695	-	1.00											
3	Financial slack	1,695	-	**0.15**	1.00										
4	Growth opportunities	1,695	-	0.04	**0.07**	1.00									
5	Firm size[a]	1,695	-	**-0.09**	**-0.16**	0.03	1.00								
6	Firm age[a]	1,695	-	0.00	-0.01	-0.03	0.03	1.00							
7	Leverage	1,695	-	**-0.06**	**-0.25**	**-0.10**	**0.08**	-0.01	1.00						
8	Intangibility	1,695	-	0.00	**-0.06**	-0.02	0.00	-0.04	**0.05**	1.00					
9	Performance	1,695	-	0.01	**0.17**	**0.10**	-0.04	0.02	**-0.27**	**-0.17**	1.00				
10	Legal form	1,695	-	**-0.18**	0.00	-0.03	**0.46**	-0.04	-0.01	**0.13**	**-0.18**	1.00			
11	Number of competitors[a]	1,695	-	-0.04	0.02	-0.01	**-0.17**	-0.01	-0.04	**-0.06**	0.04	**-0.21**	1.00		
12	Import activities	1,695	-	**-0.07**	0.01	0.02	**0.32**	0.04	-0.02	0.00	-0.03	**0.19**	**-0.13**	1.00	
13	Number of export destinations[a]	1,695	-	**-0.20**	-0.04	-0.02	**0.36**	0.02	**-0.08**	-0.01	**0.05**	**0.22**	**-0.10**	**0.23**	1.00

Panel C: Exporting firms that completely withdraw

		N	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Complete export withdrawal	516	-												
2	Debt maturity	516	-	1.00											
3	Financial slack	516	-	**0.21**	1.00										
4	Growth opportunities	516	-	-0.08	-0.05	1.00									
5	Firm size[a]	516	-	-0.05	**-0.14**	**0.16**	1.00								
6	Firm age[a]	516	-	0.04	0.03	0.01	0.05	1.00							
7	Leverage	516	-	-0.03	**-0.10**	**-0.16**	-0.02	0.02	1.00						
8	Intangibility	516	-	0.05	-0.05	-0.05	-0.07	-0.07	0.08	1.00					
9	Performance	516	-	**0.11**	-0.08	**0.19**	**0.16**	0.06	**-0.33**	-0.04	1.00				
10	Legal form	516	-	**-0.10**	0.02	-0.01	**0.43**	-0.05	**0.12**	0.04	**-0.18**	1.00			
11	Number of competitors[a]	516	-	0.05	0.00	0.06	**-0.14**	0.03	-0.04	0.02	**0.14**	**-0.20**	1.00		
12	Import activities	516	-	**-0.09**	0.02	-0.07	**0.29**	0.01	-0.01	-0.05	-0.04	**0.20**	**-0.23**	1.00	
13	Number of export destinations[a]	516	-	**-0.15**	-0.04	-0.05	**0.35**	-0.01	-0.04	0.05	-0.03	**0.29**	**-0.17**	**0.32**	1.00

Note: Correlations in bold are significant at $p < 0.05$. Variables 1, 10 and 12 are binary, thus their correlations should be interpreted with care. [a] Log-transformed variable.

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Pierre Wunsch
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