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The evolution of debt policies: New evidence from business startups

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ABSTRACT

We investigate the evolution of entrepreneurial firms' debt policies over a period of 15 years after startup, considering leverage, debt specialization, debt maturity and debt granularity. Our analysis is based on a unique sample covering all non-financial Belgian firms founded between 1996 and 1998. We find that the debt policy of entrepreneurial firms is remarkably stable over time. The debt policy in the initial year of operation is a very important determinant of future debt policies, even after controlling for traditional contemporaneous determinants. The founder-CEO has an important impact on the stability of debt policies: the influence of initial debt policies on future debt policies is significantly reduced when the founder-CEO is replaced or when (s)he dies. Combined, our findings support imprinting theory.

1. Introduction

A number of studies have found that over time, the leverage ratio of listed firms (Lemmon et al., 2008; Welch, 2004; Wu and Yeung, 2012) and established private firms (Hanousek and Shamshur, 2011) contains an important stable component. If past leverage ratios have possible bearing on future leverage ratios, a logical place to start a study of the evolution of leverage is the earliest phase of a firm's existence, i.e., its founding. However, while startups rely on debt financing to a greater extent than often recognized (Cassar, 2004; Cumming, 2005; Robb and Robinson, 2014), no study has yet examined the evolution of leverage in early-stage firms. Moreover, we lack evidence as to whether findings on the dynamics of leverage have implications for a broader range of debt policies, including debt specialization (Colla et al., 2013), debt maturity (Scherr and Hulburt, 2001) and debt granularity (Choi et al., 2014). In sum, an investigation of the evolution of entrepreneurial firms' debt policies going back to startup is timely.

How the debt policies of entrepreneurial firms evolve over time remains ambiguous from a theoretical perspective. On the one hand, information-based theories on the evolution of entrepreneurial financing predict that debt policies will change as firms age because firms reveal more information to the market and establish relationships with private debt providers (Berger and Udell, 1995; Petersen and Rajan, 1994, 2002). For instance, Berger and Udell (1998) state that "different capital structures are optimal" (p. 613) and different "sources of finance become important at different points in the financial growth cycle" (p. 622). This view thus suggests that firms' debt policies at startup may have little bearing on their future debt policies. On the other hand, imprinting theory (Boeker, 1989; Stinchcombe, 1965)—which had its roots in the management literature but is also used in economics and finance research (Bertrand and Schoar, 2003; Rotemberg and Saloner, 2000)—suggests that (a) conditions at the time of founding define initial policies and create internal consensus around the initial policies of the firm, and (b) conditions subsequent to founding tend to preserve previously adopted policies. Imprinting theory thus suggests that firms' debt policies at startup have significant bearing on their future debt policies.

Consistent with imprinting theory, corporate finance research shows how CEOs "imprint their mark" on firms' financial policies, regardless of whether it is optimal (Bertrand and Schoar, 2003, p. 1175). Schoar and Zuo (2014), for instance, show how CEOs with recession experience display more conservative styles in their future career, including holding lower leverage ratios. We therefore consider the influence of founder-CEOs on the evolution of entrepreneurial firms' debt policies. We expect that firms' initial debt policies will exert less influence on future debt policies after the departure of the founder-CEO because entrepreneurial firms

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may break out of their initial path when new CEOs are appointed. Alternatively, founder-CEO departures may be a consequence of the need for financial reorganization. Using unique data on founder-CEO deaths—exogenous CEO departures unrelated to the need for financial reorganization (or any other unmeasured variable)—we can tease out these alternative explanations.

Scholars have been severely constrained in their efforts to study the evolution of entrepreneurial firms' debt policies from founding because the data required for such an investigation are generally not available (Robb and Robinson, 2014). Belgium, however, represents a unique "laboratory" to study the evolution of firms' debt policies because *all* non-financial firms, including startups, have a legal obligation to annually file detailed financial accounts with the Belgian National Bank. Consequently, we are able to construct a unique database from the population of non-financial firms founded between 1996 and 1998, for which we have detailed financial information for as long as 15 years after startup (i.e., until 2013). Moreover, firms are required to provide detailed information concerning their founding, capital increases, appointments and resignations and the like in the Belgian Law Gazette, and this information is externally validated by a notary. The Belgian Law Gazette provides unique information about the departure of founder-CEOs in early-stage entrepreneurial firms.

We find that leverage, debt specialization, debt maturity and debt granularity policies in the initial year of operation are statistically and economically significant determinants of future debt policies—even after controlling for traditional contemporaneous determinants. Moreover, variance decomposition analyses show that the variation captured by models that include traditional capital and debt structure determinants is substantially lower than the variation captured by models that only include firm fixed effects. This finding implies that time-invariant and unobservable firm-specific factors present at startup drive the debt policies of entrepreneurial firms to a large extent. We highlight one factor: the founder-CEO. We find that the influence of initial debt policies on entrepreneurial firms' future debt policies significantly declines after the departure of founder-CEOs. To address potential endogeneity of new CEO appointments, we investigate how the death of the founder-CEO affects the evolution of entrepreneurial firms' debt policies. The results indicate that the impact of initial debt policies of entrepreneurial firms on their future debt policies significantly declines after the death of founder-CEOs.

Our study contributes to the finance literature in several ways. First, extant research focuses on cross-sectional heterogeneity in the capital structure of entrepreneurial firms by relying on cross-sectional survey data (Cassar, 2004; Cosh et al., 2009) or on comparatively short time series of financial data (Robb and Robinson, 2014). We provide unique evidence on the evolution of entrepreneurial firms' debt policies in the 15 years after founding. Second, while an increasing body of research shows the importance of debt financing for new entrepreneurial firms (e.g., Robb and Robinson, 2014), research has only skimmed the surface in terms of exploring the ways new entrepreneurial firms rely on debt financing (Robinson, 2012). We provide first-time evidence on debt specialization, debt maturity and debt granularity choices and their dynamics in very early stage firms. Third, we also contribute to the literature by investigating the effect of founder-CEOs on firm policies (e.g., Bertrand and Schoar, 2003). While several studies have examined the impact of a CEO and of CEO departures on firm policies, especially in large public firms (e.g., Malmendier et al., 2011; Fee et al., 2013), to the best of our knowledge, we are the first to examine the impact of founder-CEO departures (and deaths) on the evolution of entrepreneurial firms' debt policies.

Finally, our study has important ramifications for capital structure theory. New entrepreneurial firms are arguably the most informationally opaque firms (Berger and Udell, 1998). Consequently, we would expect the pecking order theory to be especially relevant in our context because this theory states that the existence of information asymmetry leads to a financing hierarchy. However, the stable component of capital structure cannot be explained by the pecking order theory (Dennis, 2012). Moreover, the static trade-off theory is also unable to explain the stable component of the debt policies because this theory predicts that the financial structure will be rebalanced when it deviates too much from its target (Lambrecht and Myers, 2014). While scholars have used dynamic models to explain the stable component of financial policies in mature public firms by incorporating manager-shareholder agency conflicts (Lambrecht and Myers, 2014; Morellec et al., 2012), such models are less suitable for new entrepreneurial firms, in which principal and agents are likely to be the same individuals (Fama and Jensen, 1983). However, the observed stable component of debt policies in entrepreneurial firms is in line with imprinting theory, which argues that important predictors of firms' current financing policies are their financing policies at founding.

The remainder of the paper is organized as follows. Section 2 discusses the research setting. Section 3 describes the data. Section 4 presents the empirical results. Section 5 discusses possible alternative explanations for the findings as well as several extended analyses on subsamples. Section 6 concludes.

2. Research setting

Belgium is a typical example of a Continental European, bank-based financial system in which banks play a central role in mobilizing savings and allocating capital (Demirgüç-Kunt and Levine, 1999). While the Belgian banking sector is well developed, public equity and debt markets play only a minor role in corporate financing. As in other Continental European countries, few firms are quoted on a stock exchange and initial public offerings are rare events. Public debt markets are only accessible for large and mature firms, which are not the focus of this study. The venture capital and private equity market is quite developed in Belgium, compared to other Continental European venture capital and private equity markets (Groh et al., 2010)—although less developed than the U.S. and U.K. markets.

During the timeframe of our paper, several important events occurred that may have had a significant impact on the financing of Belgian firms. First, in the period 1997–2003, Belgium experienced a significant wave of bank mergers (e.g., Degryse et al., 2011), resulting in a heavily concentrated credit market in which four banks provide nearly 80% of total outstanding credit. Second, in 2005 the Belgian government introduced a new tax measure (which was effective from 2006) to reduce the tax advantage of debt financing (e.g., Panier et al., 2013). The "notional interest deduction" allows firms subject to Belgian corporate taxes to deduct from their taxable income an amount equal to the interest they would have paid on their "corrected" equity capital if that capital were to be viewed as long-term debt financing. Third, the financial crisis had a negative impact on the Belgian banks. After the collapse of Lehman Brothers in 2008, Fortis Bank—the largest Belgian bank—had to be bailed out by the Belgian, Luxembourg, and Dutch governments. Subsequently, the other three major Belgian banks had to be rescued by the government. A survey conducted by the Belgian National Bank shows that this led to a net tightening in credit volume, general credit conditions, costs and required collateral for firms.[3]

[3] More information on the survey is available at: http://www.nbb.be/DOC/DQ/kredObs/fr/data/KO_tarifs.htm.

The occurrence of these events over the timeframe of our study should bias our results against finding stable debt policies. However, despite this bias, we find evidence that the debt policies of entrepreneurial firms in their initial year of operation are important determinants of future debt policies. Before presenting our results in detail, we first discuss our data.

3. Method

3.1. Sample

The data for this paper are from the Bel-first database. The Bel-first database is compiled by Bureau van Dijk (BvD), one of Europe's leading electronic publishers of business information. Reporting requirements imposed by the Belgian government require all non-financial firms—irrespective of their size and age—to annually file detailed financial accounts in a predefined format with the Belgian National Bank.[4] When the financial accounts are filed with the Belgian National Bank, they are processed and checked and subsequently made available to the public. BvD collects these data to compile the Bel-first database. Typically, one annual release of Bel-first covers at most the preceding ten accounting years of each firm. BvD removes firms after at least 5 years of no reporting data. Therefore, to eliminate this potential survivorship bias, we compile the database by collecting accounting information from each annual release retrospectively so that we can have the complete history of data for all firms in our sample across the entire sample period.

Firms had to fulfill several criteria to be part of our sample. First, we include all limited liability firms that were legally incorporated in 1996, 1997 or 1998. We select firms founded in multiple years to avoid that idiosyncratic events in a specific founding year would drive our results.[5] To do so, we start from the oldest Bel-first release that is available (the February 1998 release). We use subsequent Bel-first releases to collect data for these firms until the year 2013. Second, firms should have at least 1 employee and less than 50 employees, measured in full-time equivalents, in the year of startup. We use this selection criterion to exclude "ghost" firms (i.e., firms that only exist on paper, primarily for fiscal reasons) and firms that are unlikely to be *de novo* startups. Third, we only include independent startups because firms that belong to a group structure may have limited discretion over their debt policies. Firms could not be controlled by an external shareholder with an equity stake of 50% or more (except for equity stakes of families, employees and directors) and could not have participations in other firms (ownership >10%) at startup. Fourth, we exclude financial and government-owned firms because the financing of these firms may be influenced by regulatory issues. Fifth, we only select firm-year observations for which all information needed to calculate our variables is available. It is important to note that our sample not only includes firms that are active in all sample years but also firms that leave the sample over the sample period either due to bankruptcy, acquisitions or buy-outs.

The final sample contains 49,418 firm-year observations, which represent 4962 firms. Of these 4962 firms, 2347 firms are active during all sample years, while 2615 firms leave the sample either due to bankruptcy, acquisitions or buy-outs.

The financial data from the Bel-first database are supplemented with information about the departure of founder-CEOs and founder-CEO deaths. This information was, for each of the 4962 firms, manually collected using the Belgian Law Gazette. In the Belgian Law Gazette, Belgian firms are required to provide detailed information concerning their founding, capital increases, appointments and resignations and the like, and this official information is externally validated by a notary. Of the 4962 firms, there are 1907 firms in which the founder-CEO leaves the firm in the first 15 years after startup, and there are 19 firms in which a new CEO is appointed after the death of the founder-CEO.

3.2. Variables

We focus on four dependent variables, capturing distinct aspects of firms' debt policies. First, we examine the extent to which a firm's capital structure consists of debt financing by using a firm's leverage ratio. *Leverage* is measured as the ratio of total debt on total assets (e.g., Rajan and Zingales, 1995).[6] Second, we explore the extent to which the debt financing in a firm's capital structure belongs to one type of debt or to a more diversified range of debt sources. Therefore, *debt specialization* is computed using a normalized Herfindahl–Hirschman Index (HHI) of debt usage following a similar procedure as described by Colla et al. (2013). Specifically, we first calculate:

$$SS_{i,t} = \left(\frac{ID_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{BD_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{NBD_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{TD_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{OOD_{i,t}}{D_{i,t}}\right)^2 \quad (1)$$

with $SS_{i,t}$ the sum of the squared debt type ratios for firm i in year t; *ID, BD, NBD, TD* and *OOD* refer to insider debt, bank debt, non-bank debt (including debt related to payroll or social security, taxes), trade debt and other operational debt, respectively; D refers to total debt. The Herfindahl–Hirschman Index (HHI) of debt usage is subsequently computed as:

$$HH_{i,t} = \frac{SS_{i,t} - 1/5}{1 - 1/5} \quad (2)$$

HHI equals one when a firm exclusively uses one type of debt, while HHI equals zero when a firm simultaneously uses all five types of debt in equal proportion. The higher the HHI, the higher is the degree of debt specialization.[7] Third, we examine the maturity structure of firm debt. *Debt maturity* is measured as the percentage of total debt that matures in more than 5 years (Custodio et al., 2013).[8] Finally, *debt granularity* is used to measure the extent to which a firm spreads out its debt maturity dates (Choi et al., 2014) and is computed following a similar procedure as for debt specialization. Specifically, we first calculate:

$$SS_{i,t} = \left(\frac{D<1_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{D1{-}5_{i,t}}{D_{i,t}}\right)^2 + \left(\frac{D>5_{i,t}}{D_{i,t}}\right)^2 \quad (3)$$

with $SS_{i,t}$ the sum of the squared debt maturity ratios for firm i in year t; $D<1$, $D1{-}5$ *and* $D>5$ refer to the amount of debt that

[4] Belgian SMEs are allowed to report abbreviated financial statements when they comply with the following requirements. A firm should (1) employ less than 100 employees on average per year registered or (2) not meet two or more of the following criteria: (i) annual turnover >6,250,000 euro, (ii) balance sheet total >3,125,000 euro and (iii) average number of employees >50. One major difference between abbreviated and complete financial statements is that revenues only have to be disclosed in complete financial statements. However, even the abbreviated statements provide 25 pages of financial information.

[5] Results on each individual founding year are qualitatively similar to those reported below for the full sample.

[6] We also use the ratio of bank debt to total assets, and the results remain qualitatively similar. Rajan and Zingales (1995) discuss the advantages and disadvantages of different leverage measures.

[7] We also use a dummy variable, which equals one if a firm obtains at least 90% of its debt from one debt type and zero otherwise, as an alternative measure of debt specialization (e.g., Colla et al., 2013). Results remain qualitatively similar when using this alternative debt specialization measure.

[8] Due to data availability, we could only make a distinction between debt that matures in more than 5 years, debt that matures between 1 and 5 years and debt that matures in 1 year. In line with Scherr and Hulburt (2001), we therefore also measure debt maturity as the percentage of debt that matures in more than 1 year. Results remain qualitatively similar when using this alternative debt maturity measure.

matures in 1 year, the amount of debt that matures between 1 and 5 years and the amount of debt that matures in more than 5 years, respectively; D refers to total debt. The Herfindahl–Hirschman Index (HHI) of debt maturity is subsequently computed as:

$$HH_{i,t} = \frac{SS_{i,t} - 1/3}{1 - 1/3} \quad (4)$$

HHI is equal to one when a firm does not spread out its debt maturity dates, while HHI equals zero when a firm completely spreads out its debt maturity dates. We multiply this measure with −1 so that higher values of debt granularity indicate that firms increasingly spread out their debt maturity dates.[9]

The initial values (i.e., the values at startup) of these four distinct aspects of firms' debt policies are our key independent variables. We further construct a dummy variable *founder-CEO departure* and its interaction with initial debt policies to capture the influence of the departure of founder-CEOs on the relationship between entrepreneurial firms' initial debt policies and their subsequent debt policies. Founder-CEO departure equals 1 from the year of the founder-CEO departure onward and 0 otherwise.[10] We also use a dummy variable *founder-CEO death* and its interaction with initial debt policies to examine the impact of exogenous founder-CEO departures on the relationship between entrepreneurial firms' initial debt policies and their subsequent debt policies. Founder-CEO death equals 1 from the year of the founder-CEO death onward and 0 otherwise.

Several control variables that are consistently shown in prior research to be important capital structure and debt structure determinants are included in our analyses, including firm size, profitability, tangibility and growth opportunities (e.g., Titman and Wessels, 1988; Rajan and Zingales, 1995; Brav, 2009; Colla et al., 2013; Choi et al., 2014). *Firm size* is measured as the natural logarithm of total assets. *Profitability* is measured as the amount of earnings before interest and taxes (EBIT) to total assets. *Tangibility* is measured as the ratio of net property, plant and equipment to total assets. *Firm growth* is measured as the relative growth in total assets (i.e., total assets of the firm in year t minus total assets in year $t-1$, and this is divided by total assets in year $t-1$). We further include the *capital expenditures* of firms by measuring the amount of new investments in fixed assets on total assets as an additional proxy for firm growth opportunities (e.g., Brav, 2009).

The creditworthiness of firms is often proxied by ratings given by agencies such as Standard & Poor's, Moody's and Fitch Ratings. The firms in our sample, however, lack such ratings. Therefore, we use the (unlevered) FiTo score, which is a default risk indicator from Graydon. Graydon is the market leader in commercial and marketing information as well as credit and debt management in Belgium. The FiTo score takes values between 0 (financially distressed firms) and 1 (financially healthy firms). The firm-year observations are divided into three categories according to their FiTo score by using dummy variables. *Dummy low creditworthiness* is a dummy variable that is 1 for the bottom 25% of firm-year observations and zero otherwise (low creditworthiness). *Dummy medium creditworthiness* is a dummy variable that is 1 for the firm-year observations with a FiTo score between the 25th and 75th percentile and zero otherwise (medium creditworthiness). Finally, *dummy high creditworthiness* is 1 for firm-year observations with a FiTo score above the 75% percentile and zero otherwise (high creditworthiness).

Where appropriate we include year and industry fixed effects in the regressions. We also control for *Industry median leverage* (*debt specialization, debt maturity* or *debt granularity*), which is measured as the median leverage (debt maturity, debt specialization or debt granularity) of all firms in the same 4-digit industry as the focal firm.

4. Results

4.1. Descriptive statistics

Table 1 presents summary statistics for the entire sample with all firm-year observations and for the startup subsample with first-year observations only. Table 1 shows that firms in the startup sample have higher leverage ratios, relative to firms in the entire sample. The high leverage ratios of startups are in line with recent findings of Robb and Robinson (2014) and Vanacker and Deloof (2015). In addition, firms in the startup sample tend to have a slightly more specialized debt structure, a higher debt maturity and a slightly lower debt granularity, relative to firms in the entire sample. However, these differences largely reflect changes in industry leverage, debt specialization, debt maturity and debt granularity, respectively. Founder-CEO departures are quite common and even in the first year of operation founder-CEOs leave their function in 5.5% of the startups.[11] Founder-CEO deaths are rare events. Unsurprisingly, firms in the startup sample are smaller, exhibit lower profitability, have higher capital expenditures and are less creditworthy, relative to firms in the entire sample.

Table 2 shows the correlations between the dependent, independent and control variables, expect for industry and year dummies. The high correlations between the distinct debt policy variables (dependent variables) and their initial values (independent variables) already provide preliminary evidence that initial debt policies are important drivers of future debt policies. Multicollinearity is unlikely to unduly influence our subsequent results as variance inflation factors in all models (unreported) are well below the critical threshold of 10 (Kutner et al., 2004).

4.2. The influence of initial debt policies on future debt policies

We investigate the influence of initial debt policies on future debt policies by estimating the following ordinary least squares (OLS) regressions[12]:

$$Y_{it} = \alpha + \beta X_{i,t-1} + \gamma Y_{i0} + \nu_t + \varepsilon_{i,t} \quad (5)$$

where Y_{it} is the debt policy (leverage, debt specialization, debt maturity or debt granularity, respectively) of firm i at time t; X is a set of previously identified capital and debt structure determinants that are lagged 1 year; Y_{i0} represents a firm's debt policy in the initial year of operation (leverage, debt specialization, debt maturity or debt granularity, respectively); ν is a time fixed effect, and ε is a random error term. Table 3 reports the estimated coefficients and robust standard errors clustered at the firm level.[13]

[9] In contrast to Choi et al. (2014), we do not take the inverse of the HHI but rather multiply the HHI with −1 because we otherwise lose data (i.e., those firms that completely spread out their debt maturity dates).

[10] The available information does not allow us to consider whether the founder-CEO remains a shareholder after (s)he ceases to be the CEO. The fact that we cannot take this into account provides a bias *against* finding any significant effect of founder-CEO departure, as the founder can still exert influence on the firms' policies if (s)he remains a shareholder.

[11] Founder-CEO departures in the initial year of operation do not reflect bankruptcies in the initial year of operation. The founder-CEO departure variable does not get a value equal to 1 when a firm exits as a consequence of a bankruptcy or another event, because such an approach would mix firm exits with founder-CEO departures.

[12] Because the dependent variables are bounded above and below, we also used Tobit regressions as robustness checks. Results remain qualitatively similar.

[13] We also perform the regression analyses by clustering both at the firm level and at the year level. By clustering on two dimensions simultaneously, it is possible to capture the unspecified correlation between observations on the same firm in different years and between observations on different firms in the same year completely in cases in which the time effect is not fixed (Petersen, 2009). The regression results remain qualitatively similar.

Table 1
Descriptive statistics. The sample consists of 4962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup. The table presents the mean, median (in brackets) and standard deviations (SD) for the entire sample of all firm-year observations and the subsample of new incorporations. Variable definitions are provided in the Appendix.

Variable	All firm-year observations		First-year observations	
	Mean [Median]	SD	Mean [Median]	SD
Leverage	0.629 [0.682]	0.249	0.753 [0.808]	0.199
Debt specialization	0.401 [0.356]	0.212	0.419 [0.373]	0.212
Debt maturity	0.096 [0.000]	0.203	0.128 [0.000]	0.269
Debt granularity	−0.534 [−0.452]	0.338	−0.555 [−0.476]	0.340
Founder-CEO departure	0.273 –	–	0.055 –	–
Founder-CEO death	0.002 –	–	0.000 –	–
Firm size	5.838 [5.877]	1.416	4.884 [5.050]	1.636
Profitability	0.063 [0.043]	0.108	0.049 [0.025]	0.121
Tangibility	0.303 [0.240]	0.255	0.322 [0.265]	0.258
Firm growth	0.071 [0.010]	0.262	– –	–
Capital expenditures	0.025 [0.000]	0.040	0.084 [0.100]	0.032
Dummy low creditworthiness	0.247 –	–	0.360 –	–
Dummy medium creditworthiness	0.485 –	–	0.533 –	–
Dummy high creditworthiness	0.269 –	–	0.107 –	–
Industry median leverage	0.668 [0.664]	0.085	0.724 [0.724]	0.080
Industry median debt specialization	0.355 [0.344]	0.052	0.362 [0.353]	0.055
Industry median debt maturity	0.005 [0.000]	0.047	0.015 [0.000]	0.080
Industry median debt granularity	−0.612 [−0.596]	0.162	−0.613 [−0.599]	0.157
Number of observations[1]	49,418		4962	

[1] The number of observations for debt specialization, debt maturity, debt granularity, industry median debt specialization, industry median debt maturity and industry median debt granularity equals 48,185 (all firm-year observations) and 4853 (first-year observations), respectively.

For each dependent variable (leverage, debt specialization, debt maturity and debt granularity), we first estimate models in which the only independent variable is the initial debt policy. In models (a) (leverage), (d) (debt specialization), (g) (debt maturity) and (j) (debt granularity), the effects of initial debt policies on future debt policies are highly statistically significant and also economically significant. A one-standard deviation increase in a startup's initial leverage (debt specialization, debt maturity or debt granularity) corresponds to an average increase of 10.5% (6.7%, 6.3% or 15.1%) in future values of leverage (debt specialization, debt maturity or debt granularity).

In models (b), (e), (h) and (k), we add year and industry fixed effects and variables that are consistently shown to be important capital and debt structure determinants (e.g., Brav, 2009; Colla et al., 2013). Adding the traditional determinants increases the adjusted *R*-squared for leverage from 17.7% in model (a) to 43.6% in model (b). While the coefficient of initial leverage becomes smaller when adding these additional variables, initial leverage still remains very important. After adding the traditional debt structure determinants, for debt specialization, the adjusted *R*-squared increases from 9.8% in model (d) to 12.9% in model (e), for debt maturity, it increases from 10.7% in model (g) to 22.6% in model (h), and for debt granularity, it increases from 19.9% in model (h) to 37.0% in model (k). While the influence of initial debt specialization, initial debt maturity structure and initial debt granularity choices decreases when adding additional variables, they remain economically very important determinants of the future debt specialization, debt maturity structure and debt granularity choices, respectively.

Given our limited understanding of the effects of the traditional capital structure and debt structure variables on the debt policies in new entrepreneurial firms (e.g., Robb and Robinson, 2014), it is also interesting to take a closer look at the coefficients of the control variables. Our findings on the traditional determinants of leverage are consistent with the capital structure literature. In line with Brav (2009) and Rajan and Zingales (1995), we find that firm size and tangibility are positively correlated with leverage, while profitability is negatively correlated with leverage. Consistent with the findings of Brav (2009) for private firms, firm growth is positively correlated with leverage. High creditworthy firms have lower leverage, relative to low creditworthy firms (Vanacker and Deloof, 2015). Finally, industry median leverage is positively correlated with leverage (Lemmon et al., 2008), although the correlation is economically modest.

For the effects of the traditional determinants on debt specialization choices, we find no relation between firm size and debt specialization (Colla et al., 2013). Firm profitability is negatively correlated with debt specialization, while we find a positive correlation between tangibility and debt specialization. The latter finding is in line with Bolton and Scharfstein (1996), who argue that firms with more easily redeployable assets will have a more specialized debt structure. Firm growth, capital expenditures and creditworthiness have an economically modest correlation with debt specialization. Industry median debt specialization is positively correlated with debt specialization.

Turning to the effects of the traditional determinants of debt maturity structure, we find a positive correlation between firm size and debt maturity, which is consistent with the idea that smaller firms issue short-term debt to reduce agency problems (Smith and Warner, 1979). Profitability has a statistically significant negative impact on debt maturity. In line with Morris (1976), who argues that firms try to match the maturity of debt with the maturity of their assets, tangibility positively correlates with debt maturity. Surprisingly, firm growth is positively correlated with debt maturity, which contradicts evidence from more established private firms (Heyman et al., 2008). Capital expenditures are also positively correlated with debt maturity. Creditworthiness and industry median debt maturity have an economically modest correlation with debt maturity.

With respect to debt granularity, we find that larger firms have a tendency to spread out their debt maturity dates more. Profitability correlates negatively with debt granularity, while tangibility, firm growth and capital expenditures are positively correlated with debt granularity. These findings are in line with Choi et al. (2014) for public firms. The medium creditworthiness variable indicates that firms with medium creditworthiness spread out their debt maturity dates more compared to firms with a low creditworthiness. Industry median debt granularity is positively correlated with debt granularity.

We conduct two additional analyses to test for the robustness of our results. First, the effect of initial debt policies we find in Table 3 might reflect an influence of initial values of the traditional capital and debt structure determinants on future debt policies. When this is the case, the influence of initial leverage (initial debt specialization, initial debt maturity and initial debt granularity, respectively) should disappear when the values of the initial traditional determi-

Table 2
Correlation matrix. The sample consists of 4962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup. All correlations with an absolute value equal or higher than 0.010 are statistically significant at the 5% significance level.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
(1)	Leverage	1.000																				
(2)	Debt specialization	−0.047	1.000																			
(3)	Debt maturity	0.214	0.193	1.000																		
(4)	Debt granularity	0.298	−0.257	0.476	1.000																	
(5)	Initial leverage	0.419	−0.053	0.088	0.184	1.000																
(6)	Initial debt specialization	0.012	0.312	0.076	−0.075	0.055	1.000															
(7)	Initial debt maturity	0.109	0.058	0.327	0.281	0.235	0.144	1.000														
(8)	Initial debt granularity	0.111	−0.093	0.203	0.446	0.297	−0.215	0.497	1.000													
(9)	Founder-CEO departure	−0.090	0.019	−0.024	−0.046	−0.045	0.009	−0.020	−0.042	1.000												
(10)	Founder-CEO death	−0.009	0.001	0.003	0.003	−0.003	−0.006	0.008	0.000	0.082	1.000											
(11)	Firm size	0.098	0.037	0.159	0.122	0.140	0.098	0.171	0.073	0.149	0.003	1.000										
(12)	Profitability	−0.294	−0.116	−0.106	−0.097	−0.040	−0.016	−0.046	−0.034	0.003	0.006	0.075	1.000									
(13)	Tangibility	0.249	0.093	0.383	0.498	0.089	0.070	0.234	0.291	−0.024	−0.019	0.055	−0.173	1.000								
(14)	Firm growth	0.129	−0.004	0.040	−0.004	−0.053	−0.024	−0.070	−0.067	−0.022	−0.004	0.105	0.205	−0.019	1.000							
(15)	Capital expenditures	0.152	−0.008	0.079	0.114	−0.009	−0.029	−0.026	0.028	−0.087	−0.012	−0.075	−0.028	0.188	0.369	1.000						
(16)	Dummy low creditworthiness	0.148	0.072	0.026	−0.005	−0.039	−0.006	−0.007	−0.007	0.011	−0.007	−0.172	−0.619	0.094	−0.148	−0.001	1.000					
(17)	Dummy medium creditworthiness	0.242	−0.013	0.087	0.141	0.128	0.011	0.069	0.071	−0.045	0.004	0.047	0.007	0.109	0.064	0.034	−0.528	1.000				
(18)	Dummy high creditworthiness	−0.406	−0.055	−0.135	−0.156	−0.106	−0.006	−0.070	−0.073	0.055	0.005	0.125	0.602	−0.217	0.074	−0.080	−0.347	−0.588	1.000			
(19)	Industry median leverage	0.149	0.005	0.042	0.017	0.070	0.015	0.017	0.029	−0.048	−0.024	−0.116	−0.078	0.086	0.010	0.091	0.056	0.060	−0.148	1.000		
(20)	Industry median debt specialization	−0.037	0.168	0.046	−0.071	−0.055	0.162	0.034	−0.075	0.027	−0.019	0.090	0.001	0.062	0.001	0.002	0.011	−0.035	0.021	0.001	1.000	
(21)	Industry median debt maturity	0.029	0.030	0.059	0.019	0.006	0.042	0.041	0.019	−0.029	−0.005	0.015	−0.017	0.057	0.003	0.038	0.014	0.006	−0.029	0.055	0.065	1.000
(22)	Industry median debt granularity	−0.094	−0.041	−0.009	0.132	0.090	−0.026	0.077	0.172	0.104	0.013	0.120	0.002	0.130	−0.102	−0.174	−0.032	−0.051	0.073	−0.140	−0.110	0.007

Table 3
The influence of initial debt policies. The sample consists of 4962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup. Coefficients in all specifications are estimated using OLS. To facilitate the comparison of the coefficients, we standardize the independent and the control variables to have zero mean and unit variance. Standard errors are reported in parentheses and are computed robust to both clustering at the firm level and heteroskedasticity. Variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent variable: debt policy	Leverage			Debt specialization			Debt maturity			Debt granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial debt policy	0.105***	0.087***	0.093***	0.067***	0.060***	0.061***	0.063***	0.044***	0.052***	0.151***	0.104***	0.117***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Firm size		0.041***	0.066***		0.000	0.006		0.024***	0.045***		0.033***	0.064***
		(0.003)	(0.004)		(0.003)	(0.004)		(0.002)	(0.004)		(0.003)	(0.006)
Profitability		−0.028***	−0.028***		−0.021***	−0.023***		−0.004***	−0.007***		−0.006**	−0.009***
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.003)	(0.003)
Tangibility		0.028***	0.047***		0.013***	0.017***		0.058***	0.069***		0.126***	0.148***
		(0.002)	(0.003)		(0.003)	(0.003)		(0.003)	(0.003)		(0.004)	(0.004)
Firm growth		0.043***	0.040***		0.003***	0.003**		0.016***	0.016***		0.016***	0.015***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.002)
Capital expenditures		0.011***	0.006***		−0.004***	−0.005***		0.004***	0.001		0.019***	0.013***
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Dummy medium creditworthiness		0.006***	0.006***		−0.002	−0.001		0.001	0.001		0.023***	0.021***
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.003)	(0.003)
Dummy high creditworthiness		−0.062***	−0.059***		0.007**	0.006**		−0.006***	−0.006***		0.006*	−0.005
		(0.003)	(0.003)		(0.003)	(0.003)		(0.002)	(0.002)		(0.004)	(0.004)
Industry median debt policy		0.005**	0.003*		0.017***	0.015***		0.004**	0.003*		0.020***	0.023***
		(0.002)	(0.002)		(0.003)	(0.003)		(0.002)	(0.002)		(0.004)	(0.004)
Initial firm size			−0.038***			−0.007			−0.029***			−0.042***
			(0.004)			(0.004)			(0.004)			(0.006)
Initial profitability			−0.012***			0.009**			0.005*			0.004
			(0.004)			(0.004)			(0.003)			(0.005)
Initial tangibility			−0.033***			−0.005			−0.021***			−0.044***
			(0.003)			(0.003)			(0.003)			(0.005)
Initial firm growth			0.011***			0.000			0.000			0.001
			(0.003)			(0.002)			(0.002)			(0.003)
Initial capital expenditures			0.000			−0.006**			0.001			0.014***
			(0.002)			(0.002)			(0.002)			(0.003)
Initial dummy medium creditworthiness			0.000			−0.005			0.002			0.007*
			(0.003)			(0.003)			(0.003)			(0.004)
Initial dummy high creditworthiness			0.003			0.000			0.002			−0.003
			(0.004)			(0.004)			(0.003)			(0.005)
Initial industry median debt policy			0.004			0.003			0.003			−0.008**
			(0.003)			(0.004)			(0.003)			(0.004)
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adjusted R^2	0.177	0.436	0.460	0.098	0.129	0.133	0.107	0.226	0.244	0.199	0.370	0.388
Observations	44,456	44,456	44,456	43,332	43,332	43,332	43,332	43,332	43,332	43,332	43,332	43,332

nants are added. However, the results of models (c), (f), (i) and (l) in Table 3 show that the initial debt policies remain significant when the initial determinants are added. This suggests that the effects of initial debt policies cannot be explained by the initial values of the traditional capital and debt structure determinants.

Second, we test if the large average impact of initial debt policies on future debt policies (as shown in Table 3) is driven by a large influence of initial debt policies during the early years in the firm's life cycle, despite a minimal influence in the later years (e.g., DeAngelo and Roll, 2015). To do this, we estimate Eq. (5) for a subsample in which we only retain the observations when firms are 6 years or older and a subsample in which we only retain the observations when firms are 11 years or older.[14] Panel A of Table 4 shows that firms' debt policies in their initial year of operation remain statistically and economically significant determinants of future debt policies when we only retain the firm-year observations for which firms are 6 years or older. When we create a subsample in which we only retain the observations when firms are 11 years or older in panel B, the results remain qualitatively similar. While the influence of initial debt policies becomes smaller as firms age, they remain important determinants of entrepreneurial firms' future debt policies.

[14] The coefficients of the control variables are not reported but are in line with those in Table 3.

In sum, our results show the existence of an important stable component in entrepreneurial firms' debt policies. Indeed, initial debt policies, which are time-invariant factors, are one of the most important drivers of future debt policies even when we control for traditional contemporaneous determinants.

4.3. The importance of firm-specific effects on debt policies

Next, we analyze the importance of time-invariant, firm-specific factor(s) by conducting a variance decomposition of the debt policies. Specifically, we use the following equation:

$$Y_{it} = \alpha + \beta X_{i,t-1} + \eta_i + \nu_t + \varepsilon_{i,t} \quad (6)$$

where η *represents* the firm fixed effect in the equation and all other variables as defined in Eq. (5).

Table 5 reports the fraction of the total partial sum of squares of the respective model captured by each variable or effect. Panel A represents the results of the variance decomposition of leverage, while panels B, C and D report the results of the variance decomposition of debt specialization, debt maturity and debt granularity, respectively.

Models (a) of each panel, which include only firm fixed effects, explains 56.8% (40.9%, 42.9% and 56.6%) of the total variation in leverage (debt specialization, debt maturity and debt granularity) of our sample. Models (b) show that the industry fixed effects do

Table 4
The influence of initial debt policies based on subsamples. The sample consists of 4962 Belgian firms founded between 1996 and 1998. Coefficients in all specifications are estimated using OLS. To facilitate the comparison of the coefficients, we standardize the independent and the control variables to have zero mean and unit variance. Standard errors are reported in parentheses and are computed robust to both clustering at the firm level and heteroskedasticity. The control variables included in the models, which are not reported in this table, correspond with those included in the corresponding models in Table 3. Variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Panel A: subsample with observations when firms are 6 years or older

Dependent variable	Leverage			Debt specialization			Debt maturity			Debt granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial debt policy	0.086***	0.067***	0.071***	0.047***	0.039***	0.040***	0.038***	0.018***	0.026***	0.120***	0.073***	0.082***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adjusted R^2	0.114	0.367	0.390	0.047	0.093	0.096	0.044	0.199	0.216	0.124	0.347	0.361
Observations	28,401	28,401	28,401	27,697	27,697	27,697	27,697	27,697	27,697	27,697	27,697	27,697

Panel B: subsample with observations when firms are 11 years or older

Dependent variable	Leverage			Debt specialization			Debt maturity			Debt granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial debt policy	0.077***	0.060***	0.061***	0.040***	0.033***	0.034***	0.028***	0.010***	0.015***	0.102***	0.058***	0.065***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.006)	(0.005)	(0.006)
Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Industry FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Adjusted R^2	0.086	0.295	0.318	0.033	0.083	0.086	0.023	0.197	0.208	0.088	0.335	0.348
Observations	12,364	12,364	12,364	12,097	12,097	12,097	12,097	12,097	12,097	12,097	12,097	12,097

not explain much of the total variation in leverage (debt specialization, debt maturity and debt granularity). Similarly, the year fixed effects do not explain much of the total variation in the models as depicted in models (c) and (d). These findings suggest that time-invariant factors account for the majority of variation in capital structures of new entrepreneurial firms. It also suggests that theories based on time-varying factors can offer only a rather incomplete explanation for the heterogeneity in capital and debt structures in a time-series study.

Model (e) shows the results of Eq. (6) when using the traditional capital and debt structure determinants as previously specified. These variables are able to explain 30.6% (5.8%, 18.4% and 28.5%) of the leverage (debt specialization, debt maturity and debt granularity) variation, which is much lower than the explanatory power of models (a), which simply include firm fixed effects.

Adding firm fixed effects leads to a large increase in the adjusted R^2 from model (e) to model (f) for all debt variables. For leverage, it increases from 30.6% to 71.2%, for debt specialization from 5.8% to 44.2%, for debt maturity from 18.4% to 51.8%, and for debt granularity from 28.5% to 64.3%.

In sum, the results of the variance decompositions suggest that there is an important unobserved firm-specific factor that drives the debt policies of new entrepreneurial firms. This observation was also made by Lemmon et al. (2008) for leverage decisions, but our results suggest that this unobserved factor is already present at startup and affects a broader range of debt policies. This unobserved factor cannot be captured with traditional capital structure and debt structure variables.[15] Second, most of the variation in the debt policies stems from cross-sectional differences, as opposed to within-firm or time-series variation.

4.4. The influence of founder-CEO departures on the evolution of debt policies

Our findings so far raise the question to what extent the stable component of entrepreneurial firms' debt policies is determined by the founder-CEO. To investigate the impact of the founder-CEO on debt stability, we estimate firm-fixed-effects regressions, which allow us to control for (stable) unobserved firm-specific factors. This is important because there might be other stable unobserved firm-specific factors in addition to the founder-CEO that drive entrepreneurial firms' debt policies. Specifically, we estimate the following regression equation:

$$Y_{it} = \alpha + \beta X_{i,t-1} + \gamma * \text{Founder} - \text{CEO Departure} + w(Y_{i0} * \text{Founder} - \text{CEO Departure}) + v_t + \varepsilon_{i,t} \quad (7)$$

where Y_{it} is the debt policy (i.e., leverage, debt specialization, debt maturity or debt granularity) of firm i at time t; X is a set of previously identified capital and debt structure determinants that are lagged 1 year; *Founder-CEO Departure* is a dummy that equals 1 from the year of the founder-CEO departure onward and 0 otherwise; Y_{i0} * *Founder-CEO Departure* represents the interaction between firm's initial debt policy (i.e., initial leverage, debt specialization, debt maturity or debt granularity) and *Founder-CEO Departure*;[16] v is a time fixed effect, and ε is a random error term. Table 6 reports the estimated coefficients and robust standard errors clustered at the firm level. All models include firm and year fixed effects.

Models (a), (b), (c) and (d) of Table 6 indicate that founder-CEO departures have a statistically significant positive impact on leverage, debt specialization and debt maturity, while they have a statistically significant negative impact on debt granularity. Hence, founder-CEO successors use more debt financing, particularly

[15] In line with DeAngelo and Roll (2015), we also run additional models in which we include firm-time interactions. Although part of the explanatory power attributed to firm fixed effects is due to suppression of these interaction effects, firm fixed effects remain very important.

[16] Note that the main effects of the initial debt policies are now absorbed in the firm fixed effects, which also control for any other unmeasured but stable firm characteristic that influences firms' debt policies.

Table 5
Variance decomposition of debt policies. The sample consists of 4962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup. Variable definitions are provided in the Appendix. Firm FE are firm fixed effects. Year FE are year fixed effects. Industry FE are industry fixed effects. Panels A, B, C and D present the results of the variance decomposition of leverage, debt specialization, debt maturity and debt granularity, respectively.

Panel A: leverage						
Variable	Leverage					
	(a)	(b)	(c)	(d)	(e)	(f)
Firm FE	1.000	–	–	0.895	–	0.934
Year FE	–	–	1.000	0.105	0.310	0.048
Firm size	–	–	–	–	0.229	0.007
Profitability	–	–	–	–	0.035	0.002
Tangibility	–	–	–	–	0.106	0.006
Firm growth	–	–	–	–	0.045	0.002
Capital expenditures	–	–	–	–	0.000	0.000
Dummy medium creditworthiness	–	–	–	–	0.007	0.000
Dummy high creditworthiness	–	–	–	–	0.125	0.001
Industry median leverage	–	–	–	–	0.006	0.000
Industry FE	–	1.000	–	–	0.138	–
Adj. R^2	0.568	0.043	0.093	0.645	0.306	0.712
Panel B: debt specialization						
Variable	Debt specialization					
	(a)	(b)	(c)	(d)	(e)	(f)
Firm FE	1.000	–	–	0.998	–	0.993
Year FE	–	–	1.000	0.002	0.017	0.001
Firm size	–	–	–	–	0.003	0.000
Profitability	–	–	–	–	0.156	0.004
Tangibility	–	–	–	–	0.126	0.000
Firm growth	–	–	–	–	0.010	0.000
Capital expenditures	–	–	–	–	0.035	0.000
Dummy medium creditworthiness	–	–	–	–	0.000	0.000
Dummy high creditworthiness	–	–	–	–	0.015	0.000
Industry median debt specialization	–	–	–	–	0.149	0.000
Industry FE	–	1.000	–	–	0.488	–
Adj. R^2	0.409	0.035	0.001	0.410	0.058	0.442
Panel C: debt maturity						
Variable	Debt maturity					
	(a)	(b)	(c)	(d)	(e)	(f)
Firm FE	1.000	–	–	0.975	–	0.955
Year FE	–	–	1.000	0.025	0.020	0.010
Firm size	–	–	–	–	0.097	0.010
Profitability	–	–	–	–	0.001	0.000
Tangibility	–	–	–	–	0.721	0.022
Firm growth	–	–	–	–	0.021	0.002
Capital expenditures	–	–	–	–	0.002	0.000
Dummy medium creditworthiness	–	–	–	–	0.001	0.000
Dummy high creditworthiness	–	–	–	–	0.002	0.000
Industry median debt maturity	–	–	–	–	0.001	0.000
Industry FE	–	1.000	–	–	0.135	–
Adj. R^2	0.429	0.025	0.008	0.443	0.184	0.518
Panel D: debt granularity						
Variable	Debt granularity					
	(a)	(b)	(c)	(d)	(e)	(f)
Firm FE	1.000	–	–	0.987	–	0.939
Year FE	–	–	1.000	0.013	0.027	0.017
Firm size	–	–	–	–	0.040	0.008
Profitability	–	–	–	–	0.000	0.000
Tangibility	–	–	–	–	0.778	0.035
Firm growth	–	–	–	–	0.001	0.000
Capital expenditures	–	–	–	–	0.007	0.001
Dummy medium creditworthiness	–	–	–	–	0.010	0.000
Dummy high creditworthiness	–	–	–	–	0.001	0.000
Industry median debt granularity	–	–	–	–	0.014	0.000
Industry FE	–	1.000	–	–	0.124	–
Adj. R^2	0.566	0.043	0.002	0.575	0.285	0.643

Table 6
The influence of founder-CEO departure. The sample consists of 4962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup. Coefficients in all specifications are estimated using Firm FE. To facilitate the comparison of the coefficients, we standardize the independent and the control variables to have zero mean and unit variance. Standard errors are reported in parentheses and are computed robust to both clustering at the firm level and heteroskedasticity. Variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent variable: debt policy	Leverage	Debt specialization	Debt maturity	Debt granularity
	(a)	(b)	(c)	(d)
Firm size	0.091***	0.011***	0.058***	0.090***
	(0.003)	(0.003)	(0.003)	(0.004)
Profitability	−0.019***	−0.017***	−0.005***	−0.002
	(0.001)	(0.002)	(0.001)	(0.002)
Tangibility	0.039***	−0.002	0.039***	0.100***
	(0.002)	(0.002)	(0.002)	(0.003)
Firm growth	0.037***	0.005***	0.017***	0.015***
	(0.001)	(0.001)	(0.001)	(0.001)
Capital expenditures	0.005***	0.001	0.006***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)
Dummy medium creditworthiness	0.001	0.003**	−0.002**	0.006***
	(0.001)	(0.001)	(0.001)	(0.002)
Dummy high creditworthiness	−0.025***	0.004**	−0.005***	−0.002
	(0.001)	(0.002)	(0.002)	(0.002)
Industry median debt policy	−0.001	0.005***	0.003**	0.010***
	(0.001)	(0.002)	(0.001)	(0.003)
Founder-CEO departure	0.097***	0.036***	0.019***	−0.040***
	(0.005)	(0.005)	(0.001)	(0.003)
Initial debt policy * founder-CEO departure	−0.093***	−0.039***	−0.033***	−0.057***
	(0.005)	(0.003)	(0.002)	(0.003)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.720	0.449	0.508	0.652
Observations	44,456	43,332	43,332	43,332

Table 7
The influence of founder-CEO death. The sample consists of 4962 Belgian firms founded between 1996 and 1998. For 19 firms the founder-CEO dies as the firms are tracked for up to 15 years after startup. Coefficients in all specifications are estimated using Firm FE. To facilitate the comparison of the coefficients, we standardize the independent and the control variables to have zero mean and unit variance. Standard errors are reported in parentheses and are computed robust to both clustering at the firm level and heteroskedasticity. Variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent variable: debt policy	Leverage	Debt specialization	Debt maturity	Debt granularity
	(a)	(b)	(c)	(d)
Firm size	0.093***	0.012**	0.062***	0.092***
	(0.061)	(0.005)	(0.004)	(0.006)
Profitability	−0.020***	−0.018***	−0.006***	−0.003
	(0.002)	(0.002)	(0.001)	(0.002)
Tangibility	0.038***	−0.001	0.039***	0.101***
	(0.003)	(0.003)	(0.003)	(0.004)
Firm growth	0.038***	0.005***	0.017***	0.015***
	(0.001)	(0.001)	(0.001)	(0.002)
Capital expenditures	0.005***	0.001	0.005***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)
Dummy medium creditworthiness	0.002	0.003*	−0.002	0.006***
	(0.001)	(0.002)	(0.001)	(0.002)
Dummy high creditworthiness	−0.025***	0.003	−0.005**	−0.001
	(0.002)	(0.002)	(0.002)	(0.003)
Industry median debt policy	−0.001	0.005**	0.004**	0.008**
	(0.001)	(0.002)	(0.002)	(0.021)
Founder-CEO death	0.031***	0.003	0.002**	−0.012***
	(0.007)	(0.004)	(0.001)	(0.004)
Initial debt policy * founder-CEO death	−0.029***	−0.002	−0.003***	−0.015***
	(0.007)	(0.005)	(0.001)	(0.004)
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.716	0.446	0.500	0.649
Observations	44,456	43,332	43,332	43,332

long-term debt financing, and have a less diversified debt structure (i.e., they use less debt sources and their debt maturity dates are less spread out).[17] These findings are in line with the view that founder-CEOs can be relatively conservative in their financial decision-making (e.g., Ang, 1991).

However, for the purpose of our study, we are primarily interested in the interaction between initial debt policies and founder-CEO departures. We expect this interaction, i.e. the coefficient w from Eq. (7), to be significantly negative. When the founder-CEO departs, the influence of the initial debt policies on the future debt policies significantly declines, relative to when the founder-CEO remains in function. Consistent with our expectation, models (a), (b), (c) and (d) of Table 6 show that after the departure of the founder-CEO, the influence of a firm's initial leverage (debt specialization, debt maturity and debt granularity) on future values of leverage (debt specialization, debt maturity and debt granularity) is 9.3% (3.9%, 3.3% and 5.7%) lower.[18] These findings provide support for the view that founder-CEOs "imprint their mark" on the debt policies of the firms they manage; as founder-CEOs leave their function the impact of initial debt policies on future debt policies decreases significantly.

As Fee et al. (2013) note, the endogenous nature of CEO departures makes it difficult to determine whether policy changes after a change in a firm's CEO are caused by the departure of the CEO, by a decision of the firm's board or by another unobserved variable.[19] Therefore, we replace the founder-CEO departure dummy in Eq. (7) by a founder-CEO death dummy. Focusing on founder-CEO deaths allows us to examine the impact of exogenous founder-CEO departures on the evolution of entrepreneurial firms' debt policies. In this way, it is possible to investigate whether the decrease in importance of initial debt policies on entrepreneurial firms' future debt policies after the departure of the founder-CEO is caused by CEO-style effects. If the style of founder-CEOs has an impact on the debt policies of new entrepreneurial firms, we would expect to find a decline in the importance of initial debt policies after exogenous founder-CEO departures.

The results in Table 7 using founder-CEO deaths confirm our results from Table 6. Founder-CEO deaths increase firms' leverage, debt specialization (although not statistically significant) and debt maturity ratios, while they lower the extent to which firms spread out their debt maturity dates across time. More importantly, we find in Table 7 that after the founder-CEO dies, the impact of initial leverage, debt maturity and debt granularity on future leverage, debt maturity and debt granularity declines. The impact of initial debt specialization on future debt specialization also declines after exogenous founder-CEO departures, but this effect is not significant at traditional levels ($p = 0.111$). These results suggest that founder-CEOs imprint their mark on the debt policies of their firms, causing a stable component in entrepreneurial firms' debt policies. However, firms change inertial debt policies after founder-CEO departures.[20]

In sum, the regression analyses in this section show that entrepreneurial firms' initial debt policies become less impactful for their future debt policies after the departure of the founder-CEO. These results suggest that one unobserved firm-specific factor that drives the debt policy decisions of new entrepreneurial firms is the founder-CEO.

5. Alternative explanations and robustness checks

We interpret our findings in the context of imprinting theory, which implies that founding decisions play an important role in imprinting firm characteristics that are perpetuated over time. However, there are some alternative explanations for our findings, which we discuss below. Detailed results of the robustness checks discussed below are available in the Internet appendix.

First, it is possible that the observed stability of debt policies at the firm level is driven in large part by low speeds of adjustment to moving target debt policies. To investigate this possibility, we run partial-adjustment models of firm debt policies and estimate the speed of adjustment of firms' actual debt policies to their target debt policies (see Lemmon et al. (2008) for a similar approach). However, results are not consistent with this alternative explanation. Specifically, partial-adjustment models that include firm-fixed effects exhibit higher model fit and higher speeds of adjustment, relative to models without firm-fixed effects. Hence, time-invariant, firm-specific factors drive target debt policies. Overall, our findings suggest that not only entrepreneurial firms' debt policies but also their target debt policies contain an important stable component.

A second alternative explanation for our findings is that it is the presence of the founder-CEO in the firm rather than his/her preference for a particular debt policy that matters. A CEO change may have a large impact on the firm's fundamental characteristics and access to external finance, and as a result affect its capital structure. Especially the prospects of new and small firms, like the ones we study, are often closely tied to founder-CEOs' skills (Cooper et al., 1994), which implies that founder-CEO departures (deaths) may have a strong negative impact on the firm's future prospects. Furthermore, discontinued lending relationships after founder-CEOs departures (deaths) might increase adverse selection and moral hazard risks between firms and their lenders (Berger and Udell, 1995; Petersen and Rajan, 1994). If it is the simple presence of founder-CEOs in firms that matters, we therefore expect to find that founder-CEO departures (deaths) decrease firm performance and increase the likelihood of going bankrupt. However, we find that firm profitability increases after the departure of the founder-CEO, although the effect is economically very small. Founder-CEO deaths do not influence subsequent firm profitability. In addition, founder-CEO departures do not have a significant impact on the likelihood of going bankrupt, while founder-CEO deaths decrease the likelihood of going bankrupt. Thus, these additional tests contradict the argument that the simple presence of founder-CEOs is more important than founder-CEOs' preferences for a particular debt policy.

Third, firms characterized by higher levels of information asymmetry may not have access to debt financing and thus initially rely more on equity financing (e.g., Berger and Udell, 1998). As a result, the stability of debt policies might be stronger for firms

[17] Findings are confirmed in regression models without the interaction term between initial debt policies and founder-CEO departures. However, the main effect of founder-CEO departure is no longer statistically significant in the debt specialization and debt granularity models.

[18] When founder-CEOs depart during the earliest phase in the firm's existence, they may not have had sufficient time to imprint their mark, or alternatively, their policies may not have been institutionalized yet. Consistent with this idea, unreported supplementary regressions confirm that founder-CEO departures more strongly decrease the effect of initial debt policies on future debt policies when founder-CEO departures happen during the first five (six or seven) years after founding relative to when they happen after the first five (six or seven) years after founding.

[19] In our research context, it is unlikely that the policy changes after a change in a firm's CEO are caused by a decision by a firm's board because most of the firms in our sample do not have a board.

[20] There are only 19 firms in our sample where the founder-CEO dies in the first 15 years after startup. This small number might lead to inefficiency in the estimation and unreliable point estimates. However, despite these problems, our results for founder-CEO death and its interaction with initial debt policy is consistent with the founder-CEO departure analyses.

characterized by lower levels of information asymmetry, while the debt policies of firms characterized by higher levels of information asymmetry might be more in line with the traditional information-based theories on the evolution of entrepreneurial financing. To test for this possibility, we distinguish between firms based on the level of information asymmetry. Specifically, we run separate regressions for startups founded in high-tech industries and startups founded in other industries. However, we fail to find significant differences in the relation between initial debt policies and future debt policies for both subsamples. These findings indicate that differences in the level of information asymmetry do not drive the stable component of firms' debt policies.

Fourth, we test for the possibility that the stable component of entrepreneurial firms' debt policies is caused by firms that have already achieved their desired structure (or size) at startup and, as a consequence, do not grow much in the next 15 years after startup. For this purpose, we compute the average yearly growth rate in total assets of each firm based on the entire period it is in the sample. Based on their average yearly growth rate in total assets, firms are sorted into four portfolios, i.e. firms with a low, medium, high and very high average yearly growth rate, respectively. We find that initial leverage, debt specialization and debt granularity exert less influence on future leverage, debt specialization and debt granularity for the firms with very high average yearly growth rates. However, even in the sample of firms with a very high average yearly growth rate, the initial debt policies remain an important determinant of future debt policies. Thus, irrespective of firm growth, initial debt policies significantly influence future debt policies.

Fifth, we investigate whether our results are potentially driven by very small firms that may have limited operational activities but dominate the population of entrepreneurial firms (and our sample). Indeed, our sample firms employ on average about 6 employees and the median firm employs 3 people (all in full time equivalents). We analyze subsamples of firms with more than one (five and ten) employee(s) in the year of startup. The results based on these different subsamples remain quantitatively similar. Hence, the stable component of firms' debt policies and the results of the founder-CEO departure analyses are not driven by the smallest firms.

Finally, firms may leave the sample early either due to bankruptcies, acquisitions or buy-outs. This may bias our results. To address this issue, we examine the subsample of survivors, i.e., the subsample of firms that are active in all sample years. The unreported results reveal that entrepreneurial firms' debt policies still contain a stable component when we limit the sample to the firms that are active in all sample years.

6. Conclusion

This paper is the first to provide evidence on the evolution of a broad range of debt policies, including leverage, debt specialization, debt maturity and debt granularity policies, in entrepreneurial firms from startup. Our analysis is based on a unique dataset, based on the universe of Belgian firms founded between 1996 and 1998, which we track for up to 15 years after startup.

We find that entrepreneurial firms' leverage, debt specialization, debt maturity and debt granularity policies contain an important time-invariant, stable component that remains present in the 15 years after startup. Specifically, financing decisions at startup serve as strong predictors of future financing decisions, and this is the case even after controlling for the traditional contemporaneous capital structure and debt structure variables, such as firm size, profitability, tangibility and growth. This finding is in line with imprinting theory. Our findings further suggest that current capital structure and debt structure research is missing an important time-invariant, firm-specific factor(s) present from startup that drives the stable component of debt policies. Our results suggest that one important time-invariant, firm-specific factor is the founder-CEO. The influence of initial debt policies of entrepreneurial firms on future debt policies declines significantly after the departure (and death) of the founder-CEO.

Our findings underscore the need for more research on financial decision making in very early stage firms that goes beyond the traditional capital structure and debt structure variables. We provide a fresh perspective to increase our understanding of financial decision making in early stage entrepreneurial firms—i.e., imprinting theory—and hope our paper will encourage others to study more fully the evolution of entrepreneurial firms' debt policies from startup.

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Appendix A. Variable definitions

Variables	Definitions
Leverage	Total debt/total assets
Debt specialization	Herfindahl–Hirschman Index of debt usage that refers to the degree of debt specialization. HHI is equal to one when a firm only uses one type of debt, while HHI equals zero when a firm simultaneously uses all types of debt in equal proportion
Debt maturity	The percentage of total debt that matures in more than 5 years
Debt granularity	Herfindahl-Hirschman Index of debt maturity that refers to the degree to which a firm spreads out its debt maturity dates across time. HHI is equal to one when a firm does not spread out its debt maturity dates across time, while HHI equals zero

(*continued on next page*)

Appendix A (*continued*)

Variables	Definitions
	when a firm completely spreads out its debt maturity dates across time. This measure is multiplied by minus one so that higher values of debt granularity indicate that firms increasingly spread out their debt maturity dates
Initial leverage (debt specialization, debt maturity and debt granularity)	The value of leverage (debt specialization, debt maturity and debt granularity) at startup
Founder-CEO departure	A dummy variable that equals 1 from the year of the founder-CEO departure onward and 0 otherwise
Founder-CEO death	A dummy variable that equals 1 from the year of the founder-CEO death onward and 0 otherwise
Firm size	ln(total assets)
Profitability	EBIT/total assets
Tangibility	Net PPE/total assets
Firm growth	(Total assets in year t − total assets in year $t-1$)/total assets in year in year $t-1$
Capital expenditures	New investments in fixed assets/total assets
Dummy low (medium and high) creditworthiness	A dummy variable that equals 1 for firms with a low (medium and high) creditworthiness and 0 otherwise. Firms are classified into three categories according to their FiTo score (i.e., a default risk indicator from Graydon–the market leader in commercial and marketing information as well as credit and debt management in Belgium). Firms with a low (medium and high) creditworthiness were taken to be those situated below the 25th percentile (those situated between the 25th and the 75th percentile; and those situated above the 75th percentile)
Industry median leverage (debt specialization, debt maturity and debt granularity)	The median leverage (debt specialization, debt maturity and debt granularity) of all firms in the same industry as the focal firm

Appendix B. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.jbankfin.2016.01.008.

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