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Essays on the financing of new firms:

New evidence on stability and country effects

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If you can't fly, then run.
If you can't run, then walk.
If you can't walk, then crawl,
but whatever you do,
you have to keep moving forward.
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These people above are on my mind
Got me on the drive
Got me on the ride
Until the end of a wonderful time

Jürgen Hanssens

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Table of contents

List of tables

CHAPTER 2

CHAPTER 3

CHAPTER 4

List of figures

CHAPTER 3

Nederlandse samenvatting (Summary in Dutch)

De financieringsbeslissing is één van de meest fundamentele beslissingsgebieden binnen iedere onderneming. Hoe een onderneming zich financiert heeft verregaande gevolgen voor haar operaties, falingsrisico, financiële prestaties en groeipotentieel. Ondanks het belang ervan blijft onze kennis over het financieel beslissingsproces van bedrijven vanaf het moment van oprichting beperkt. Het doel van dit proefschrift is om onze kennis over de financiering van nieuwe bedrijven uit te breiden.

Het doel van de eerste studie van dit proefschrift is om aan te tonen hoe een brede reeks aan schuldpolitieken, met name de financiële hefboom, de graad van schuldspecialisatie, de looptijdstructuur van de schulden en de graad van specialisatie van de looptijdstructuur evolueren vanaf de opstart van een bedrijf. Vanuit theoretisch oogpunt zijn er twee tegengestelde visies die argumenteren hoe de schuldpolitieken van nieuwe ondernemingen over tijd evolueren. Eén visie suggereert dat schuldpolitieken zullen veranderen als ondernemingen ouder worden omdat bedrijven meer informatie bekendmaken en relaties opbouwen met private schuldverschaffers. Een andere visie suggereert dat schuldpolitieken stabiel kunnen blijven over tijd door “een stempel” (imprint) van de oprichter-CEO. De bevindingen van de eerste studie tonen aan dat de schuldpolitieken van nieuwe bedrijven een belangrijke stabiele component bevatten. Financieringsbeslissingen bij opstart voorspellen toekomstige financieringsbeslissingen in grote mate. Mijn bevindingen tonen verder aan dat tijdsonafhankelijke, bedrijfsspecifieke factoren de stabiele component in de schuldpolitieken drijft. Tot slot concludeer ik dat de oprichter-CEO een belangrijke bedrijfsspecifieke factor is die de schuldpolitieken van nieuwe ondernemingen drijft.

De tweede studie van dit proefschrift onderzoekt hoe buffers aan financiële middelen (overtollige financiële middelen die niet nodig zijn voor de dagdagelijkse operaties) in nieuwe

bedrijven over tijd evolueren. Wanneer bedrijven over buffers aan middelen beschikken, kunnen managers deze middelen gebruiken om hun bedrijven te beschermen tegen interne en externe moeilijkheden en om strategisch te werk te gaan. De bevindingen van deze studie tonen aan dat de dynamiek in de hoeveelheid overtollige middelen, veroorzaakt door managers die overtollige middelen opbouwen en gebruiken, nietig lijkt in vergelijking met een stabiele component in de hoeveelheid overtollige middelen. De initiële hoeveelheid overtollige middelen heeft een lange termijn impact op de daaropvolgende hoeveelheid overtollige middelen. Nieuwe ondernemingen die een grote hoeveelheid overtollige middelen hebben bij opstart hebben later typisch ook een grote hoeveelheid overtollige middelen terwijl nieuwe ondernemingen die een kleine hoeveelheid overtollige middelen hebben bij opstart later een kleine hoeveelheid overtollige middelen hebben. Ik theoretiseer over het proces that ervoor zorgt dat de hoeveelheid overtollige middelen van nieuwe bedrijven stabiel blijft over tijd. Mijn bevindingen tonen aan dat oprichter-CEOs een belangrijke factor zijn achter de initiële hoeveelheid overtollige middelen in bedrijven en een langdurige impact hebben op de hoeveelheid overtollige middelen in bedrijven door institutionalisatie.

In de derde en laatste studie focus ik op verschilllen tussen landen in de kapitaalstructuur van nieuwe ondernemingen op basis van het “tweede kans” beleid in een land—de mogelijkheid voor failliete ondernemers om kwijtschelding van hun uitstaande schulden te krijgen. Hoewel academici die zich, op basis van steekproeven afkomstig uit individuele landen, op de kapitaalstructuur van nieuwe ondernemingen hebben gefocust interessante bevindingen hebben geleverd, toont deze studie aan dat een onderzoek naar hoe landspecifieke factoren de kapitaalstructuur van nieuwe ondernemingen beïnvloeden onze kennis kan vergroten. Ik ontdek dat er significante verschillen bestaan tussen landen in hoe de kaptiaalstructuur van nieuwe ondernemingen bepaald wordt. Mijn bevindingen tonen verder

aan dat de mogelijkheid in een land om een tweede kans te krijgen de toegang tot schuldfinanciering voor nieuwe ondernemingen verlaagt.

Samen toon ik in dit proefschrift aan dat de financieringspolitieken van nieuwe ondernemingen een belangrijke stabiele component bevatten. Financieringspolitieken bij opstart hebben een significante invloed op toekomstige financieringspolitieken. De oprichter-CEO van nieuwe bedrijven is een belangrijke factor die ervoor zorgt dat financieringspolitieken bij opstart ontstaan en stabiel blijven doorheen de tijd. Ik toon verder aan dat er een significante heterogeniteit bestaat tussen verschillende landen voor wat betreft de kapitaalstructuur van nieuwe bedrijven in het jaar van opstart. Een "tweede kans" beleid in het bijzonder beïnvloedt de kapitaalstructuur van nieuwe bedrijven bij oprichting. Specifiek maken nieuwe bedrijven minder gebruik van schuldfinanciering als er een "tweede kans" beleid gevoerd wordt.

Executive summary

Financial decision-making is one of firms' most fundamental decision areas. How firms are financed has far-reaching consequences for the operations of the firm, risk of failure, firm performance, and the growth potential of the business. Despite its importance our knowledge of firms' financial decision-making from the start-up time onwards remains limited. The aim of this dissertation is to further extend our knowledge on new firm financing.

The goal of the first study of this dissertation is to provide first-time evidence on the evolution of a broad range of debt policies, including leverage, debt specialization, debt maturity and debt granularity policies, in new firms from start-up. How the debt policies of new firms evolve over time is ambiguous from a theoretical perspective. One vision suggests that debt policies will change as firms age because firms reveal more information to the market and establish relationships with private debt providers. Another vision suggests that debt policies may remain stable over time due to an imprint of the founder-CEO. The findings of the first study indicate that new firms' debt policies contain an important stable component. Financing decisions at start-up are found to be strong predictors of future financing decisions. Furthermore, my findings demonstrate that time-invariant, firm-specific factor(s) drive the stable component of debt policies. Finally, I conclude that the founder-CEO is one important firm-specific factor that drives new firms' debt policies.

The second study of this dissertation examines how financial slack levels in new firms evolve over time. When firms possess slack, managers can use these resources to buffer their firms from internal and external turmoil and to pursue strategic behaviors. While past research that has focused on the effects of possessing slack thus assumes levels of slack are dynamic, the findings of this study demonstrate that initial slack levels (i.e. slack levels at founding) have a long-term impact on subsequent slack levels. New firms that hold large amounts of

slack at start-up typically hold large amounts of slack later-on, while new firms that hold small amounts of slack at start-up have small amounts of slack later-on. I theorize on the process that cause new firms' slack levels to persist over time. My findings indicate that founder-CEOs are an important factor behind initial slack levels in firms and have a lasting impact on firms' slack levels due to institutionalization.

In the third and final study, I focus on cross-country differences in new firms' capital structure based on countries' fresh start policy—the possibility for bankrupt entrepreneurs to discharge their outstanding credit obligations. Even though entrepreneurial finance scholars that have focused on the capital structure of new firms using samples from individual countries have yielded interesting insights, this study demonstrates that an investigation of how country-specific factors influence the capital structure of new firms may foster knowledge accumulation. I discover that significant differences across countries exist in how new firms' capital structure is determined. My findings further suggest that the possibility of a fresh start in a country reduces new firms' access to debt financing.

Overall, in this dissertation I demonstrate that new firms' financial policies contain an important stable component. Financial policies at start-up are likely to have significant bearing on future financial policies. New firms' founder-CEO is found to be an important factor that cause financial policies at start-up to originate and persist. I further demonstrate that significant heterogeneity across countries exists in new firms' capital structure in their initial year of operation. A fresh start policy, in particular, is found to influence new firms' capital structure at start-up. Specifically, new firms use less debt if a fresh start policy has been implemented.

Chapter 1:
General introduction

This doctoral dissertation studies different aspects relevant for the entrepreneurship, finance and management field. In this introductory chapter, I first briefly introduce the three research gaps that I identified and how I will contribute to the existing literature. Second, I describe the empirical setting of the different studies and what the advantages and disadvantages are. Third, I present the main findings and contributions of the individual studies. Finally, I discuss the structure of the rest of this dissertation.

1.1 Research gaps

A large number of studies have investigated the dynamics of and cross-country differences in the financing decisions of listed (e.g., Djankov et al., 2003, 2007, 2008; Lemmon et al., 2008; Wu and Yeung, 2012) and established private firms (e.g., Hanousek and Shamshur, 2011). In contrast, scholars examining new firms' financial policies have largely relied on cross-sectional data sets and on data sets of limited geographic focus (Cassar, 2004; Cumming, 2005; Robb and Robinson, 2014). This is unfortunate since new firms are situated in the beginning of the financial growth cycle as compared to most of the firms that have been the subject of study in prior research that uses a longitudinal approach to study firm financing. Moreover, research that looks at the financing of new firms from a multi-country angle may also foster knowledge accumulation in the entrepreneurial finance literature. Consequently,

the central goal of this dissertation is to provide new insights into the financing of new firms.

In order to do so, this dissertation aims to address the following three research questions:

(1) how do the debt policies of new firms evolve from start-up,

(2) how do slack levels in new firms evolve,

(3) how does a fresh start policy influence new firms' capital structure.

Addressing these main research questions helps to improve our understanding of new firms' financial decision-making process. Below, I will briefly elaborate on each of these questions and how I will contribute to the existing literature.

1.1.1 Study 1: The evolution of debt policies: New evidence from business startups

Given that new firms are the backbone of every economy, playing an important role in job creation and innovation, it is unfortunate that our knowledge of financial decision-making in new firms from start-up remains limited. In this study, I therefore provide a fresh perspective—i.e., imprinting theory—to increase our understanding of financial decision-making in new firms. Specifically, I provide first-time evidence on the evolution of new firms' debt policies over a period of 15 years after start-up and the role of founder-CEOs in explaining this evolution.

1.1.2 Study 2: Stubborn and persistent: Levels of slack resources in new firms

Slack resources in firms have been portrayed as being inherently dynamic and to grow, for instance, as firms perform well and managers store slack (e.g., Sharfman et al., 1988) and fall as managers consume slack to buffer their firms from external shocks (e.g., Wan and Yiu, 2009) or pursue new strategic actions (e.g., O'Brien, 2003). However, while authors focusing on the effects of possessing slack resources often talk about how managers build up and deploy slack, the evolution of slack levels within firms remains unexplored and represents a "black box". Contrary to the above dynamic image that is a key—but untested—mechanism in prior research on the consequences of possessing slack resources, there are theoretical reasons to expect that slack levels may contain an important stable component within firms

over time. Drawing on the imprinting literature I advance three hypotheses to study the evolution of slack resources in new firms.

1.1.3 Study 3: The capital structure of business start-ups across Europe: The effect of a fresh start policy

The final study analyzes cross-country differences in new firms' capital structure depending on countries' fresh start policy. Given that new firms are characterized by high failure rates, policy makers across the world tend to provide honest bankrupt entrepreneurs with a second chance by implementing a fresh start policy—the possibility for bankrupt entrepreneurs to discharge their outstanding credit obligations. Research on fresh start has indicated that a fresh start policy enhances entrepreneurial activity (Armour and Cumming, 2008). In this study, I show that a fresh start policy also has counter effects since it reduces the credit availability for new firms.

1.2 Empirical setting

The three studies in this dissertation use two different data sets of new firms. The first and second study of this dissertation focus on new Belgian firms while the third study takes a multi-country angle including new firms from 26 European countries. The goal of this section is to offer more details about the research context of the different studies and the different data sets that are used.

1.2.1 New Belgian firms

The longitudinal data set that is used in the first and second study is a hand-collected database of 4,962 Belgian firms founded in 1996, 1997 or 1998 that are followed for up to 15 years

after founding and cover 49,418 firm-year observations. I select firms founded in multiple years to avoid that idiosyncratic events in a specific founding year would drive my results.[1]

The longitudinal financial data for these new firms were collected from the Bel-first database and supplemented with information about founder-CEO departures and deaths. This information was, for each of the 4,962 firms, manually collected using the Belgian Law Gazette which offers externally validated information concerning the founding, capital increases, founder-CEO appointments and resignations of all Belgian firms.

The Belgian research context has several advantages. First, *all* Belgian non-financial firms, including new firms, have a legal obligation to annually file detailed financial accounts in a detailed predefined format with the Belgian National Bank. Hence, rich longitudinal financial statement data is available for *all* Belgian non-financial firms. Second, focusing only on Belgian firms reduces the unobserved heterogeneity among firms resulting from variance in country-specific conditions. Third, Belgian firms are required to provide detailed information concerning their founding, capital increases, founder-CEO appointments, founder-CEO 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 and death of founder-CEOs in new firms. Lastly, due to the nature of the Belgian data, my sample does not only include 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. Thereby, survivorship bias was limited.

An important disadvantage of the data sets used in the first and second study of my dissertation is the lack of detailed information on the founder-CEO of the new Belgian firms. The founder-CEO dummy (or fixed effect) in the regressions is my only proxy for *all* founder-CEO characteristics that remain (largely) stable over time and that determine the way

[1] Results on each individual founding year are qualitatively similar to those based on the full sample.

founder-CEOs influence new firms' financial policies. As a result, I cannot examine the impact of founder-CEO characteristics on new firms' financial policies. The availability of direct measures of founder-CEO characteristics would allow me to estimate the relative importance of specific founder-CEO characteristics on new firms' financial policies.

1.2.2 New European firms

The cross-sectional data set that is used in the third study consists of 2,849,997 new firms that were founded in 26 European countries between 2005 and 2012. Firm-level accounting data for this study was collected using the *Amadeus* database and supplemented with country-level data that come from the International Insolvency Institute, reports of the European Commission, the Worldwide Governance Index and different data sources of the World Bank.

The European context is particularly suitable to investigate cross-country differences in new firms' capital structure depending on countries' fresh start policy since the broad legal systems that exist around the globe today originated in Europe. Moreover, my data set covers both Western- and Eastern-European countries and both countries that are a member of the European Union and countries that are not a member of the European Union. As a result, significant heterogeneity exists between the different countries in my dataset. These cross-country differences may influence the costs and benefits in determining new firms' capital structure and therefore provided me the opportunity to examine the effect of variations in the institutional environment on new firms' capital structure.

The European data set also offers another advantage. As disclosure requirements in Europe require firms to publish annual accounting information, I have financial statement information for a large number of European firms. I was able to link this firm-level accounting data with country-level data which provided me the opportunity to examine how

country-specific factors (i.e. countries' fresh start policy) influence new firms' capital structure while controlling for firm-level characteristics.

A disadvantage of the data set used in the third study is the lack of information about new firms' founder-CEOs and their wealth. Founder-CEOs' prior experience with entrepreneurship and their wealth may influence the impact of countries' fresh start policy on the credit availability to these new firms. However, due to the lack of this data, I cannot disentangle distinctive effects of countries' fresh start policy on new firms' capital structure depending on the prior entrepreneurship experience and wealth of their founder-CEOs. Moreover, I am also unable to determine the relative importance of founder-CEOs and country-specific factors in influencing new firms' capital structure.

1.3 Conclusions of the individual studies

In this section, I present the main findings and contributions of each study individually. I refer to the last chapter for broader (theoretical) conclusions and implications across studies.

1.3.1 Study 1: The evolution of debt policies: New evidence from business startups

The first study examines the evolution of new firms' debt policies over a period of 15 years after startup, considering leverage, debt specialization, debt maturity and debt granularity. Our results demonstrate that new firms' debt policies are remarkably stable over time. Debt policies at startup serve as strong predictors of future debt policies. The founder-CEO is found to be an important factor behind this stability of debt policies: the influence of initial debt policies on future debt policies declines significantly after the departure (and death) of the founder-CEO.

Taken together, these findings make several important contributions. First, we contribute to the finance literature by providing unique evidence on the evolution of new firms' debt

policies in the 15 years after founding. Previous research focuses on cross-sectional heterogeneity in the capital structure of new firms by relying on cross-sectional survey data (Cassar, 2004; Cosh, Cumming and Hughes, 2009) or on comparatively short time series of financial data (Robb and Robinson, 2014). Yet, to our knowledge, our study is the first to investigate how new firms' debt policies evolve over time, thereby creating more clarity about financial decision making in very early stage firms. Second, our study is not limited to examining leverage and its dynamics in very early stage firms. Rather, we provide first-time evidence on debt specialization, debt maturity and debt granularity choices and their dynamics in very early stage firms. Third, as prior studies that have examined the impact of a CEO and of CEO departures on firm policies largely focus on large public firms (e.g., Fee, Hadlock and Pierce, 2013; Malmendier, Tate and Yan, 2011), this study advances our understanding of how founder-CEO departures (and deaths) impact the evolution of new firms' debt policies. Finally, our study has important ramifications for capital structure theory. The observed stable component of debt policies in new firms cannot be explained by traditional capital structure theories (i.e. the pecking order and static trade-off theory). However, we point out that the observed stable component of debt policies in new firms is in line with imprinting theory.

1.3.2 Study 2: Stubborn and persistent: Levels of slack resources in new firms

The second study of this dissertation empirically investigates how slack levels in new firms evolve over time. While past research that has focused on the effects of possessing slack assumes levels of slack are dynamic, our results demonstrate that initial slack levels (i.e. slack levels at founding) are important determinants of future slack levels. Thus, slack levels in firms contain an important stable component. Consistent with the idea that founder-CEO imprints represent an important explanation for the stability in slack levels, we find that the

relationship between initial slack levels and future slack levels weakens after the departure of founder-CEOs. This finding is particularly strong when founder-CEOs have a short tenure.

This study makes several contributions. First, we contribute to slack research by arguing that slack levels in firms contain an important stable component. Theoretically, slack resources have been portrayed as being either more or less discretionary in nature (e.g., Bourgeois, 1981; Bourgeois and Singh, 1983; Sharfman et al., 1988). Financial slack, for instance is expected to be easily redeployable for managers since it is often assumed to be highly discretionary in nature (e.g., George, 2005). However, we point out that even for so-called high discretionary slack, managers may find it difficult—or may be unwilling—to redeploy these resources. Making the distinction between the stable and dynamic components of slack levels is important as the antecedents and consequences of both components may be fundamentally different. Second, we contribute to the literature on the impact of founder-CEOs and their successors. A recent stream of research in the strategic management literature has focused on identifying the relative importance of CEO effects on firm performance (e.g., Fitza, 2014; Quigley and Graffin, 2016). However, CEOs do not influence performance by simply sitting in their offices. To better understand if and how CEOs influence firm performance, we provide evidence on how CEOs influence resource accumulation and deployment.

1.3.3 Study 3: The capital structure of business start-ups across Europe: The effect of a fresh start policy

The third study of this dissertation examines cross-country differences in new firms' capital structure based on countries' fresh start policy—the possibility for bankrupt entrepreneurs to discharge their outstanding credit obligations. We demonstrate that significant differences across countries exist in how new firms' capital structure is determined. The availability of a

fresh start is found to be one country-specific factor that is responsible for these differences. New firms experience a significant decline in the access to debt financing after the implementation of a fresh start policy.

This study makes several contributions. First, we add to the literature on the effects of creditor/debtor protection (Djankov et al., 2007; Shleifer and Vishny, 1997) by highlighting the role of a fresh start in countries' personal bankruptcy laws in explaining significant differences across countries in how new firms are financed. More broadly, our study is related to a growing literature that examines the effects of changes in the financial and regulatory environment on new firms (Kerr and Nanda, 2009; Klapper et al., 2006). Second, we contribute to the entrepreneurial finance literature by providing first-time cross-country evidence on new firms' capital structure. Previous studies examining new firms' capital structure have focused on samples from individual countries (Cerqueiro and Penas, 2016; Cosh et al., 2009; Cumming, 2005, 2006; Robb and Robinson, 2014), but not investigated whether cross-country differences exist in new firms' capital structure. Scholars agree that country-specific factors may deal with market imperfections and, therefore, influence the access to financial resources (Djankov et al., 2003, 2007, 2008; Giannetti, 2003; La Porta et al., 1998). Yet, to our knowledge, our study is the first to provide evidence on the determinants of new firms' capital structure based on a multi-country sample and the impact of countries' fresh start policy on new firms' capital structure more in specific.

1.4 Structure of the dissertation

The remainder of this dissertation is organized as follows. Chapter 2 contains the first study: "*The evolution of debt policies: New evidence from business startups*". This study investigates the evolution of new firms' debt policies over a period of 15 years after startup. For this purpose, a longitudinal dataset comprising 4,962 Belgian firms founded in 1996, 1997 or 1998

that are followed for up to 15 years after startup is used. This study provides a fresh perspective—i.e. imprinting theory—to increase our understanding of financial decision making in early stage firms. Chapter 3 includes the second study: *"Stubborn and persistent: Levels of slack resources in new firms"*. Using a longitudinal data set of 4,962 Belgian firms founded between 1996 and 1998 that are followed for up to 15 years after startup, this study provides a novel theoretical perspective and first-time empirical evidence on the evolution of slack levels in new firms. Chapter 4 comprises the fourth study: *"The capital structure of business start-ups across Europe: The effect of a fresh start policy"*. This study investigates cross-country differences in the capital structure of new firms in their initial year of operation. For this purpose, a cross-sectional data set of 2,849,997 start-ups from 26 European countries founded between 2005 and 2012 is used. This study provides new cross-country evidence on the capital structure of new firms in general and the effect of a fresh start policy on new firms' capital structure more in specific. Finally, chapter 5 formulates an overall conclusion, the limitations of this dissertation, avenues for further research and implications.

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Chapter 2:

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.

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2.1 Introduction

A number of studies have found that over time, the leverage ratio of listed firms (Lemmon, Roberts and Zender, 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, Ippolito and Li, 2013), debt maturity (Scherr and Hulburt, 2001) and debt granularity (Choi, Hackbarth and Zechner, 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 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, Cumming and Hughes, 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, Tate and Yan, 2011; Fee, Hadlock and Pierce, 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, Nikolov and Schürhoff, 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 2.2 discusses the research setting. Section 2.3 describes the data. Section 2.4 presents the empirical results. Section 2.5 discusses possible alternative explanations for the findings as well as several extended analyses on subsamples. Section 2.6 concludes.

2.2 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, Liechtenstein and Lieser, 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, Masschelein and Mitchell, 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, Pérez-González and Villanueva, 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.[1]

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.

2.3 Method

2.3.1 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.[2] When the financial accounts are filed with the Belgian National Bank, they are processed and checked and subsequently made available to the public.

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

[2] 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.

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 five 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.[3] 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.

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

The final sample contains 49,418 firm-year observations, which represent 4,962 firms. Of these 4,962 firms, 2,347 firms are active during all sample years, while 2,615 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 4,962 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 4,962 firms, there are 1,907 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.

2.3.2 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).[4] 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:

[4] 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.

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

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.[5] Third, we examine the maturity structure of firm debt. *Debt maturity* is measured as the percentage of total debt that matures in more than five years (Custodio, Ferreira and Laureano, 2013).[6] 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 matures in one year, the amount of debt that matures between one

[5] 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.

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

and five years and the amount of debt that matures in more than five 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.[7]

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.[8] 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.

[7] 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).

[8] 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.

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.

2.4 Results

2.4.1 Descriptive statistics

Table 2.1 presents summary statistics for the entire sample with all firm-year observations and for the startup subsample with first-year observations only. Table 2.1 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.[9] 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.

*** Include Table 2.1 about here ***

[9] 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.

Table 2.2 shows the correlations between the dependent, independent and control variables, except 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).

*** Include Table 2.2 about here ***

2.4.2 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[10]:

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

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 one 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 2.3 reports the estimated coefficients and robust standard errors clustered at the firm level.[11]

*** Include Table 2.3 about here ***

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

[11] 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.

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, Deloof and Ooghe, 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 2.3 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 determinants are added. However, the results of models (c), (f), (i) and (l) in Table 2.3 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 2.3) 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 equation 5 for a subsample in which we only retain the observations when firms are six years or older and a subsample in which we only retain the observations when firms are 11 years or older.[12] Panel A of Table 2.4 shows that firms' debt policies in their initial year of operation remain statistically and economically significant

[12] The coefficients of the control variables are not reported but are in line with those in Table 2.3.

determinants of future debt policies when we only retain the firm-year observations for which firms are six 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.

*** Include Table 2.4 about here ***

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.

2.4.3 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 equation (5).

Table 2.5 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.

*** Include Table 2.5 about here ***

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 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 equation (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.[13] Second, most of the variation in the debt policies stems from cross-sectional differences, as opposed to within-firm or time-series variation.

2.4.4 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:

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

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 one 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*;[14] ν is a time fixed effect, and ε is a random error term. Table 2.6 reports the estimated coefficients and robust standard errors clustered at the firm level. All models include firm and year fixed effects.

[13] 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.

[14] 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.

*** Include Table 2.6 about here ***

Models (a), (b), (c) and (d) of Table 2.6 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 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).[15] 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 equation 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 2.6 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.[16] 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.

[15] 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.

[16] 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.

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.[17] Therefore, we replace the founder-CEO departure dummy in equation 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.

*** Include Table 2.7 about here ***

The results in Table 2.7 using founder-CEO deaths confirm our results from Table 2.6. 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 2.7 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

[17] 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.

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.[18]

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.

2.5 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

[18] 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.

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, Gimeno and Woo, 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 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.

2.6 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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Tables

Table 2.1: Descriptive statistics
The sample consists of 4,962 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.

	All firm-year observations		First-year observations	
Variable	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[19]	49,418		4,962	

[19] 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 4,853 (first-year observations), respectively.

Table 2.2: Correlation matrix

The sample consists of 4,962 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 2.3: The influence of initial debt policies
The sample consists of 4,962 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			0.000			-0.005			0.002			0.007*
Creditworthiness			(0.003)			(0.003)			(0.003)			(0.004)
Initial Dummy High			0.003			0.000			0.002			-0.003
Creditworthiness			(0.004)			(0.004)			(0.003)			(0.005)
Initial Industry Median			0.004			0.003			0.003			-0.008**
Debt Policy			(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

Table 2.4: The influence of initial debt policies based on subsamples
The sample consists of 4,962 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 six 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

Table 2.5: Variance decomposition of debt policies
The sample consists of 4,962 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

	Leverage					
Variable	(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

	Debt Specialization					
Variable	(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

	Debt Maturity					
Variable	(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

	Debt Granularity					
Variable	(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 2.6: The influence of founder-CEO departure
The sample consists of 4,962 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 2.7: The influence of founder-CEO death
The sample consists of 4,962 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

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 five 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 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.

Internet Appendix for "The evolution of debt policies: New evidence from business startups"

This appendix contains additional tables that are mentioned and described in section 5 of our paper but were not reported there to preserve space.

Table IA.2.1 examines whether 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. *TMA Leverage (Debt Specialization, Debt Maturity and Debt Granularity)* is a variable that equals the difference between the target leverage (debt specialization, debt maturity and debt granularity) and the actual leverage (debt specialization, debt maturity and debt granularity) ratios. *SOA* stands for the speed of adjustment of firms' actual debt policies to their target debt policies. *Half-life* is calculated as $\ln(0.5)/\ln(1-\lambda)$ and defined as the time (in years) it takes a firm to adjust back to the target leverage (debt specialization, debt maturity and debt granularity) after a one-unit shock to ε.

Table IA.2.2 examines whether the presence of the founder-CEO in the firm rather than his/her preference for a particular debt policy matters by looking at the influence of founder-CEO departure/death on firm performance.

Table IA.2.3 examines whether the presence of the founder-CEO in the firm rather than his/her preference for a particular debt policy matters by looking at the influence of founder-CEO

departure/death on the likelihood of going bankrupt. *Bankruptcy* is a dummy variable that equals 1 in the year a firm goes bankrupt and 0 otherwise.

Table IA.2.4 examines whether the stability of debt policies is stronger (weaker) for firms characterized by lower (higher) levels of information asymmetry. *High-Tech* is a dummy variable that equals 1 when a firm is active in a high-tech sector and 0 otherwise.

Table IA.2.5 examines whether 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. *Low (Medium, High, Very High) Growth Dummy* is a dummy variable that equals 1 if a firm has a low (medium, high, very high) average yearly growth rate and 0 otherwise.

Table IA.2.6 examines whether the results are potentially driven by very small firms that may have limited operational activities but dominate the population of entrepreneurial firms (and our sample).

Table IA.2.7 examines the subsample of surviving firms.

Table IA.2.1: Partial-adjustment models of debt policies
The sample consists of 4,962 Belgian firms founded between 1996 and 1998. Coefficients in specifications (a), (b) and (c) are estimated using OLS while coefficients in specifications (d) and (e) 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.

Panel A: Leverage

	Pooled OLS			Firm Fixed Effects	
Variable	(a)	(b)	(c)	(d)	(e)
Initial Leverage		0.105***	0.087***		
		(0.003)	(0.003)		
Firm Size			0.041***		0.094***
			(0.003)		(0.003)
Profitability			-0.028***		-0.020***
			(0.002)		(0.001)
Tangibility			0.028***		0.039***
			(0.002)		(0.002)
Firm Growth			0.043***		0.038***
			(0.001)		(0.001)
Capital Expenditures			0.011***		0.005***
			(0.001)		(0.001)
Dummy Medium Creditworthiness			0.006***		0.002
			(0.002)		(0.001)
Dummy High Creditworthiness			-0.062***		-0.025***
			(0.003)		(0.002)
Industry Median Leverage			0.005**		-0.001
			(0.002)		(0.001)
Year FE	No	No	Yes	No	Yes
Industry FE	No	No	Yes	No	Yes
TMA Leverage (SOA)	0.108	0.113	0.205	0.329	0.463
	(0.003)	(0.004)	(0.005)	(0.006)	(0.006)
Half-life	6.065	5.781	3.021	1.737	1.115
Adjusted R^2	0.043	0.036	0.089	0.142	0.227
Observations	44,456	44,456	44,456	44,456	44,456

Panel B: Debt Specialization

	Pooled OLS			Firm Fixed Effects	
Variable	(a)	(b)	(c)	(d)	(e)
Initial Debt Specialization		0.067***	0.060***		
		(0.003)	(0.002)		
Firm Size			0.000		0.012***
			(0.003)		(0.003)
Profitability			-0.021***		-0.018***
			(0.002)		(0.002)
Tangibility			0.013***		-0.001
			(0.003)		(0.002)
Firm Growth			0.003***		0.005***
			(0.001)		(0.001)
Capital Expenditures			-0.004***		0.001
			(0.001)		(0.001)
Dummy Medium Creditworthiness			-0.002		0.003*
			(0.002)		(0.001)
Dummy High Creditworthiness			0.007**		0.003*
			(0.003)		(0.002)
Industry Median Debt Specialization			0.017***		0.005***
			(0.003)		(0.002)
Year FE	No	No	Yes	No	Yes
Industry FE	No	No	Yes	No	Yes
TMA Debt Specialization (SOA)	0.301	0.325	0.338	0.585	0.590
	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
Half-life	1.936	1.764	1.680	0.788	0.777
Adjusted R^2	0.144	0.143	0.149	0.242	0.244
Observations	43,332	43,332	43,332	43,332	43,332

Panel C: Debt Maturity

	Pooled OLS			Firm Fixed Effects	
Variable	(a)	(b)	(c)	(d)	(e)
Initial Debt Maturity		0.063***	0.044***		
		(0.003)	(0.003)		
Firm Size			0.024***		0.062***
			(0.002)		(0.003)
Profitability			-0.004***		-0.006***
			(0.002)		(0.001)
Tangibility			0.058***		0.039***
			(0.003)		(0.002)
Firm Growth			0.016***		0.017***
			(0.001)		(0.001)
Capital Expenditures			0.004***		0.005***
			(0.001)		(0.001)
Dummy Medium Creditworthiness			0.001		-0.002*
			(0.002)		(0.001)
Dummy High Creditworthiness			-0.006***		-0.005***
			(0.002)		(0.002)
Industry Median Debt Maturity			0.004**		0.004***
			(0.002)		(0.001)
Year FE	No	No	Yes	No	Yes
Industry FE	No	No	Yes	No	Yes
TMA Maturity (SOA)	0.293	0.309	0.349	0.516	0.546
	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)
Half-life	1.999	1.875	1.615	0.955	0.878
Adjusted R^2	0.178	0.166	0.199	0.266	0.288
Observations	43,332	43,332	43,332	43,332	43,332

Panel D: Debt Granularity

	Pooled OLS			Firm Fixed Effects	
Variable	(a)	(b)	(c)	(d)	(e)
Initial Debt Granularity		0.151***	0.104***		
		(0.004)	(0.004)		
Firm Size			0.033***		0.092***
			(0.003)		(0.004)
Profitability			-0.006**		-0.003
			(0.003)		(0.002)
Tangibility			0.126***		0.101***
			(0.004)		(0.003)
Firm Growth			0.016***		0.015***
			(0.001)		(0.001)
Capital Expenditures			0.019***		0.009***
			(0.001)		(0.001)
Dummy Medium Creditworthiness			0.023***		0.006***
			(0.003)		(0.002)
Dummy High Creditworthiness			-0.006*		-0.001
			(0.004)		(0.002)
Industry Median Debt Granularity			0.020***		0.008***
			(0.004)		(0.003)
Year FE	No	No	Yes	No	Yes
Industry FE	No	No	Yes	No	Yes
TMA Granularity (SOA)	0.165	0.184	0.246	0.440	0.500
	(0.003)	(0.004)	(0.005)	(0.006)	(0.006)
Half-life	3.844	3.409	2.455	1.195	1.000
Adjusted R^2	0.081	0.074	0.107	0.185	0.215
Observations	43,332	43,332	43,332	43,332	43,332

Table IA.2.2: The influence of founder-CEO departure/death on firm performance
The sample consists of 4,962 Belgian firms founded between 1996 and 1998. 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	Profitability	
	(a)	(b)
Firm Size	-0.014***	-0.014***
	(0.002)	(0.002)
Tangibility	-0.006***	-0.006***
	(0.001)	(0.001)
Firm Growth	0.018***	0.018***
	(0.001)	(0.001)
Capital Expenditures	-0.002***	-0.002***
	(0.000)	(0.000)
Dummy Medium Creditworthiness	0.007***	0.007***
	(0.001)	(0.001)
Dummy High Creditworthiness	0.021***	0.021***
	(0.001)	(0.001)
Leverage	0.032***	0.032***
	(0.001)	(0.001)
Founder-CEO Departure	0.001*	
	(0.001)	
Founder-CEO Death		0.000
		(0.001)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Adjusted R^2	0.349	0.349
Observations	44,456	44,456

Table IA.2.3: The influence of founder-CEO departure/death on the likelihood of going bankrupt
The sample consists of 4,962 Belgian firms founded between 1996 and 1998. Hazard ratios in all specifications are estimated using a Cox proportional hazard model. 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	Bankruptcy	
	(a)	(b)
Firm Size	0.664***	0.665***
	(0.027)	(0.027)
Profitability	0.980	0.981
	(0.029)	(0.029)
Tangibility	0.686***	0.685***
	(0.031)	(0.031)
Firm Growth	0.930***	0.931***
	(0.016)	(0.016)
Capital Expenditures	1.174***	1.175***
	(0.020)	(0.020)
Dummy Medium Creditworthiness	0.878***	0.876***
	(0.024)	(0.024)
Dummy High Creditworthiness	0.827***	0.826***
	(0.034)	(0.034)
Leverage	1.163***	1.162***
	(0.046)	(0.045)
Founder-CEO Departure	1.050	
	(0.039)	
Founder-CEO Death		0.230***
		(0.004)
Observations	44,456	44,456

Note: A hazard ratio above one indicates a positive effect of the independent variable on the hazard of going bankrupt (less than one indicates a negative effect).

Table IA.2.4: The influence of informational asymmetry

The sample consists of 4,962 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 3.3. Variable definitions are provided in the appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Panel A: Leverage and Debt Specialization

Dependent Variable	Leverage						Debt Specialization					
	(a)		(b)		(c)		(d)		(e)		(f)	
	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech
Initial Debt Policy	0.112***	0.101***	0.095***	0.086***	0.095***	0.092***	0.068***	0.064***	0.062***	0.060***	0.061***	0.061***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Controls	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	No	No	No	No
Industry FE	No	No	No	No	No	No	No	No	No	No	No	No
Adjusted R^2	0.210	0.162	0.362	0.386	0.386	0.410	0.098	0.093	0.125	0.114	0.137	0.118
Observations	8,022	36,434	8,022	36,434	8,022	36,434	7,702	35,630	7,702	35,630	7,702	35,630

Panel B: Debt Maturity and Debt Granularity

Dependent Variable	Debt Maturity						Debt Granularity					
	(g)		(h)		(i)		(j)		(k)		(l)	
	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech	High-Tech	Non-High-Tech
Initial Debt Policy	0.066***	0.063***	0.045***	0.047***	0.053***	0.055***	0.150***	0.147***	0.106***	0.108***	0.117***	0.121***
	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)	(0.003)	(0.002)	(0.004)	(0.002)
Controls	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	No	No	No	No	No	No	No	No	No
Industry FE	No	No	No	No	No	No	No	No	No	No	No	No
Adjusted R^2	0.107	0.107	0.203	0.212	0.224	0.231	0.194	0.191	0.334	0.346	0.357	0.368
Observations	7,702	35,630	7,702	35,630	7,702	35,630	7,702	35,630	7,702	35,630	7,702	35,630

Table IA.2.5: The influence of growth after startup

A. Full sample

The sample consists of 4,962 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 3.3. Variable definitions are provided in the appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.113***	0.101***	0.105***	0.074***	0.066***	0.067***	0.071***	0.049***	0.056***	0.164***	0.116***	0.127***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)
Medium Growth Dummy	0.001	0.015	0.014	-0.002	-0.002	-0.003	0.007***	0.004**	0.003	0.010	0.001	-0.001
	(0.013)	(0.010)	(0.003)	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.006)	(0.005)	(0.005)
High Growth Dummy	0.022*	0.039***	0.035***	0.003	0.002	0.001	0.019***	0.015***	0.011***	0.020***	0.014**	0.006
	(0.012)	(0.009)	(0.008)	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.007)	(0.006)	(0.006)
Very High Growth Dummy	0.045***	0.063***	0.047***	0.028***	0.026***	0.024***	0.020***	0.013***	0.005**	0.002	-0.005	-0.018***
	(0.011)	(0.009)	(0.009)	(0.006)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)	(0.008)	(0.007)	(0.007)
Initial Debt Policy * Medium	-0.001	-0.013	-0.016	-0.005	-0.004	-0.003	-0.002	-0.001	-0.002	-0.006	-0.009	-0.009
Growth Dummy	(0.012)	(0.010)	(0.010)	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.007)	(0.006)	(0.006)
Initial Debt Policy * High	-0.009	-0.028***	-0.032***	-0.005	-0.001	-0.002	-0.004	-0.002	-0.002	-0.011	-0.009	-0.010
Growth Dummy	(0.011)	(0.008)	(0.008)	(0.005)	(0.005)	(0.005)	(0.003)	(0.003)	(0.003)	(0.008)	(0.007)	(0.006)
Initial Debt Policy * Very High	-0.025**	-0.048***	-0.047***	-0.027***	-0.025***	-0.025***	-0.009***	-0.005*	-0.005*	-0.027***	-0.026***	-0.028***
Growth Dummy	(0.010)	(0.009)	(0.008)	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.009)	(0.007)	(0.007)
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	0.185	0.443	0.463	0.102	0.133	0.136	0.120	0.232	0.246	0.210	0.375	0.391
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

B. Subsample of firms with very high average growth rates

The sample consists of the firms founded between 1996 and 1998 with a very high average yearly growth rate. 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 3.3. Variable definitions are provided in the appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.094***	0.061***	0.064***	0.039***	0.034***	0.033***	0.040***	0.028***	0.036***	0.128***	0.079***	0.084***
	(0.007)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.009)	(0.009)	(0.011)	(0.009)	(0.010)
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	0.165	0.459	0.476	0.031	0.122	0.129	0.020	0.239	0.262	0.128	0.380	0.391
Observations	6,605	6,605	6,605	6,464	6,464	6,464	6,464	6,464	6,464	6,464	6,464	6,464

Table IA.2.6: Subsamples of firms with different cut-offs for minimum number of employees
The sample consists of 4,962 Belgian firms founded between 1996 and 1998. Coefficients in the first table of each panel are estimated using OLS. Coefficients in the second table of each panel 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. The control variables included in the models, which are not reported in this table, correspond with those included in the corresponding models in Table 3.6. 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 have more than one employee in the year of startup

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.097***	0.085***	0.087***	0.073***	0.067***	0.067***	0.062***	0.045***	0.051***	0.161***	0.114***	0.126***
	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(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	0.161	0.416	0.439	0.123	0.158	0.161	0.118	0.225	0.243	0.232	0.394	0.412
Observations	25,464	25,464	25,464	24,967	24,967	24,967	24,967	24,967	24,967	24,967	24,967	24,967

Dependent Variable: Debt Policy	Leverage	Debt Specialization	Debt Maturity	Debt Granularity
	(a)	(b)	(c)	(d)
Founder CEO Departure	0.105***	0.034***	0.017***	-0.048***
	(0.007)	(0.004)	(0.002)	(0.004)
Initial Debt Policy * Founder CEO Departure	-0.103***	-0.038***	-0.033***	-0.065***
	(0.006)	(0.004)	(0.003)	(0.004)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No
Adjusted R^2	0.712	0.469	0.517	0.666
Observations	25,464	24,967	24,967	24,967

Panel B: Subsample with observations when firms have more than five employees in the year of startup

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.100***	0.094***	0.095***	0.078***	0.070***	0.072***	0.065***	0.053***	0.056***	0.188***	0.134***	0.149***
	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.009)	(0.009)
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	0.179	0.425	0.436	0.142	0.231	0.236	0.147	0.258	0.270	0.308	0.485	0.506
Observations	7,735	7,735	7,735	7,657	7,657	7,657	7,657	7,657	7,657	7,657	7,657	7,657

Dependent Variable: Debt Policy	Leverage	Debt Specialization	Debt Maturity	Debt Granularity
	(a)	(b)	(c)	(d)
Founder CEO Departure	0.124***	0.028***	0.018***	-0.055***
	(0.012)	(0.007)	(0.003)	(0.007)
Initial Debt Policy * Founder CEO Departure	-0.124***	-0.038***	-0.030***	-0.082***
	(0.012)	(0.008)	(0.005)	(0.007)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No
Adjusted R^2	0.714	0.517	0.523	0.724
Observations	7,735	7,657	7,657	7,657

Panel C: Subsample with observations when firms have more than ten employees in the year of startup

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.091***	0.093***	0.092***	0.084***	0.075***	0.077***	0.053***	0.041***	0.048***	0.193***	0.137***	0.167***
	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)	(0.010)	(0.009)	(0.009)	(0.009)	(0.013)	(0.014)	(0.013)
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	0.157	0.447	0.470	0.142	0.275	0.282	0.147	0.250	0.267	0.314	0.510	0.553
Observations	3,297	3,297	3,297	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284

Dependent Variable: Debt Policy	Leverage	Debt Specialization	Debt Maturity	Debt Granularity
	(a)	(b)	(c)	(d)
Founder CEO Departure	0.116***	0.033***	0.015***	-0.078***
	(0.016)	(0.010)	(0.004)	(0.011)
Initial Debt Policy * Founder CEO Departure	-0.121***	-0.041***	-0.037***	-0.103***
	(0.016)	(0.012)	(0.006)	(0.011)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	No	No	No	No
Adjusted R^2	0.710	0.560	0.519	0.741
Observations	3,297	3,284	3,284	3,284

Table IA.2.7: Subsample of surviving firms

The sample consists of 2,347 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 3.3. Variable definitions are provided in the appendix. ***, **, and * denote statistical significance at the 1%; 5% and 10% level, respectively.

Dependent Variable	Leverage			Debt Specialization			Debt Maturity			Debt Granularity		
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Initial Debt Policy	0.103***	0.086***	0.092***	0.062***	0.054***	0.055***	0.057***	0.038***	0.046***	0.140***	0.097***	0.110***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(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	0.178	0.450	0.473	0.098	0.132	0.137	0.087	0.224	0.243	0.177	0.360	0.378
Observations	32,147	32,147	32,147	31,599	31,599	31,599	31,599	31,599	31,599	31,599	31,599	31,599

Dependent Variable: Debt Policy	Leverage	Debt Specialization	Debt Maturity	Debt Granularity
	(a)	(b)	(c)	(d)
Founder CEO Departure	0.092***	0.031***	0.018***	-0.036***
	(0.005)	(0.004)	(0.002)	(0.003)
Initial Debt Policy * Founder CEO Departure	-0.089***	-0.035***	-0.032***	-0.053***
	(0.005)	(0.004)	(0.002)	(0.004)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.732	0.446	0.501	0.645
Observations	32,147	31,599	31,599	31,599

Chapter 3:
Stubborn and persistent:
Levels of slack resources in new firms*

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ABSTRACT

Past research has focused on the effects of possessing slack and assumed slack levels are dynamic. Drawing on imprinting theory, we argue that slack levels contain an important stable component. Thus, initial slack levels are expected to strongly influence future slack levels. This relationship, however, should weaken when founder-CEOs are replaced, particularly when founder-CEO replacements occur early on because there has been limited time for institutionalizing processes to occur. We test these propositions using data on 4,962 firms founded in Belgium between 1996 and 1998 that are tracked for up to 15 years. Findings are consistent with our predictions. Taken together, our study provides a novel theoretical perspective and first-time empirical evidence on slack levels across time in new firms.

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3.1 Introduction

Slack resources—those resources that are not consumed by the necessity of current operations—are expected to perform both a stabilizing role by allowing managers to buffer their firms from internal and external turmoil (Bourgeois, 1981; Cyert and March, 1963; Thompson, 1967) and an adaptive role by allowing managers to pursue strategic behaviors, including experimentation and innovation (Bourgeois, 1981; Cyert and March, 1963; Hambrick and Snow, 1977). Extant management research has focused on the effects of possessing slack for firm outcomes, such as performance, growth, innovation and survival (Bradley et al., 2011a, b; Bromiley, 1991; George, 2005; Greenley and Oktemgil, 1998; Greve, 2003; Kim and Bettis, 2014; Kim et al., 2008; Mishina et al., 2004; Mousa and Reed, 2013; Nohria and Gulati, 1996; Paeleman and Vanacker, 2015; Parida and Örtqvist, 2015; Simsek et al., 2007; Tan and Peng, 2003; Vanacker et al., 2013, 2016; Wang et al., 2016), albeit with conflicting findings.

Prior conflicting findings may have emerged because possessing slack alone does not make much difference for firm outcomes. Rather, managers need to "unlock" these resources first before they can influence firm outcomes (Daniel et al., 2004; Penrose, 1959; Sirmon et al., 2007). A key untested mechanism in prior research on the effects of possessing slack is that slack levels within firms are inherently dynamic. For instance, it is generally assumed that slack levels grow as firms perform well and managers store slack (Sharfman et al., 1988) and fall as managers consume slack to protect their firms against external shocks (Wan and Yiu, 2009) or pursue new strategic actions (O'Brien, 2003). Thus, while scholars focusing on the effects of possessing slack resources generally *talk* about how managers build up and deploy slack, the dynamics (or lack thereof) of slack levels within firms remains unexplored and represents a "black box".

Contrary to the above dynamic image, however, there are theoretical reasons to expect that slack levels may contain an important stable component within firms over time. A rich imprinting literature (Boeker, 1989; Kimberly, 1979; Simsek et al., 2015; Stinchcombe, 1965) suggests that conditions at the time of founding shape policies and behaviors at founding. One particularly influential founding factor that is likely to determine firms' slack levels is the founder-CEO, since slack levels in new firms generally originate from the founder-CEOs' initial capital investments (Bradley et al., 2011a) and founder-CEOs are the most important decision-makers in their firms (Wasserman, 2003). The initial slack levels may subsequently become institutionalized and thus come to imprint firms' future slack levels long after founding.

In this study, we ask the following related research questions: *Do slack levels contain an important stable component?* And if so, *how do founder-CEO replacements impact this stable component?* We provide a theoretical answer to this question by drawing on the imprinting literature (Boeker, 1989; Stinchcombe, 1965). Specifically, we hypothesize that initial slack levels (that is, slack levels at founding) will be important determinants of future slack levels. Thus, slack levels contain an important stable component. Moreover, as founder-CEO replacements represent "sensitive periods" (Marquis and Tilcsik, 2013: p. 197) these may represent an opportunity to break out inertial paths and change policies, practices or behaviors. Thus, the relationship between initial slack levels and future slack levels is hypothesized to be weaker after founder-CEO replacements. Finally, founder-CEOs with a short tenure after founding are less likely to have a persistent influence on a firm's policies, practices and behaviors (Boeker, 1989) because time is required before these become institutionalized (Sarason, 1972). Thus, we hypothesize that the relationship between initial slack levels and future slack levels will particularly weaken after founder-CEOs with short tenures are replaced rather than when founder-CEOs with long tenures are replaced.

To test our hypotheses, we employ longitudinal data on 4,962 Belgian firms that were founded between 1996 and 1998 and that were tracked for up to 15 years after founding. While firms have different types of slack resources (Bourgeois and Singh, 1983; Voss et al., 2008), in this paper, we focus on the levels of financial slack (that is, excess cash) since financial slack is easily re-deployable and therefore managers have the greatest discretion in allocating it to alternative uses (Greve, 2003). If anything, the focus on financial slack should bias our results against finding support for stable slack levels in firms over time. If unabsorbed financial slack has an important stable component, this stable component is likely to be even more important for absorbed slack resources.[1] Results from our empirical study support our hypotheses.

Our primary contribution is that we develop and empirically test a novel theory on the evolution of slack levels within firms based on the concept of imprinting. While prior research on the effects of slack resources often describes how managers build up and deploy slack, we find that slack levels in firms contain an important stable component. This finding has important implications because it suggests that managers may have limited discretion to "unlock" slack in the future, even when it is highly discretionary in nature. Overall, it is remarkable that so little research has focused on analyzing how managers actually deploy slack resources. Our study suggests that founder-CEOs have a lasting impact on firms' financial slack level due to institutionalization.

[1] The results obtained when focusing on other, less discretionary types of slack resources (including potential and recoverable slack) are qualitatively similar as the ones reported in this paper. Results are not presented in detail here but are available upon request.

3.2 Background literature

Behavioral theory scholars have provided some insights on how slack levels evolve over time within firms.[2] Cyert and March (1963), for instance, argue that slack resources are useful in times of stress since they function as a shock absorber. Supporting this shock-absorbing function, they state that slack is accumulated during good times, while the level of slack decreases during bad times. Specifically, these authors suggest that slack helps to prevent a strong increase of the aspiration level by absorbing excess resources in good times, while it helps to prevent a strong decrease of the aspiration level by using slack to deal with the lower profits or loss in bad times. Thus, slack is a dynamic "rest" category that serves to stabilize firms' operational core (Bromiley, 2005). Slack resources also play an adaptive role in the behavioral theory of the firm (Bourgeois, 1981). High slack levels may be used by managers to engage in "slack search"; that is, it allows managers to explore projects that have strong support from scientists or other corporate champions but that would not have been approved in the face of resource scarcity (Cyert and March, 1963; Greve, 2003; Nohria and Gulati, 1996).

Previous studies frequently describe (but do not show) how managers "unlock" slack resources (particularly slack that is highly discretionary in nature) and hence portray slack as fairly dynamic in nature. However, we lack a detailed understanding of the dynamics (or lack thereof) of slack resources in firms, while tracking slack levels over time "might allow for a richer theoretical argument" (George, 2005: p. 674). In this paper, we draw on imprinting theory,

[2] Agency theory has also focused on the desire of entrenched managers to retain financial slack (or excess cash) rather than increasing payouts to shareholders (Jensen, 1986). Moreover, it has suggested that managers may use financial slack to invest in pet projects. Thus, agency theory generally views the possession of slack as less desirable (and even value destroying) relative to behavioral theorists. However, the key point for our paper is that also in an agency theory perspective slack is presented as a dynamic entity. However, for most of the firms in our sample managers and shareholders are the same people. Therefore, agency motives are less likely to play a central role in our setting.

which suggests that—contrary to common wisdom—slack levels contain an important stable component. We develop our theoretical perspective below.

3.3 Hypotheses

The imprinting literature traces back to the contributions of Stinchcombe (1965) and other closely related work that has studied imprinting of firm strategies (Boeker, 1989); it stipulates that firms' founding conditions, mainly in terms of its environment and its founder-CEO, define firms' structure, strategies and operating practices at founding (Kimberly, 1979; Schein, 1983). Hence, this literature suggests that the environment and founder-CEOs may imprint the level of slack in new firms.

The environment in which new firms operate may have an imprinting effect for at least two reasons. First, new firms must follow strategies or practices that are rewarded or encouraged by their external environment in order to ensure their survival and growth (Kriauciunas and Kale, 2006). For instance, new firms are often expected to keep certain levels of cash resources to be viewed as legitimate employers (Smith and Smith, 2004). Second, the external environment provides new firms with several resources that may have a lasting influence on firms' characteristics (Carroll and Hannan, 2000). For instance, in more munificent environments, new firms perceive less need to accumulate more slack resources (Sharfman et al., 1988).

Founder-CEOs may also have an imprinting effect by means of the resources that founders acquire at founding and because of their values, norms, procedures and decision processes (Carroll and Hannan, 2000). For new firms, founder-CEOs are key decision-makers. They typically own all the equity and their initial capital investments often drive initial levels of slack in new firms (Bradley et al., 2011a; Fichman and Levinthal, 1991). Moreover, they play a

prominent role in defining the vision of the firm, attracting employees and performing the management tasks among other activities required to grow the firm (Wasserman, 2003). Hence, when policies related to slack levels are developed (Bromiley, 2005) these policies will be heavily shaped by the founder-CEO.

Once a firm's environment and/or founder-CEO have imprinted a firm's characteristics (including its slack levels) at founding, institutionalization causes firm characteristics to persist over time (Sarason, 1972). In line with imprinting theory, studies in different settings have indeed shown that a firm's founding conditions strongly impact its initial characteristics, which subsequently persist over time (Eisenhardt and Schoonhoven, 1990; Miller and Dröge, 1986). For instance, Leung et al. (2012) find that founding core team characteristics influence the human resource values of new firms, which persist over time. Bryant (2012) shows that new firms' identity, values and norms are imprinted by their founders and subsequently persist over time. Hence, initial slack levels are likely to remain persistent and be strongly related to future slack levels. Thus,

Hypothesis 1: The initial level of financial slack is an important determinant of future levels of financial slack.

As we highlighted previously, the stable component in slack levels may reflect both an environmental imprint and a founder-CEO imprint. However, we expect that founder-CEOs—given their crucial role in new firms and their direct influence on slack levels—will be particularly influential. To disentangle possible environmental imprints from founder-CEO imprints, we focus on founder-CEO replacements in firms. As new firms grow and age, founder-

CEOs are often replaced by successor-CEOs who differ from them substantially (Boeker and Karichalil, 2002; Fahlenbrach, 2009).

Founder-CEOs, for instance, often have a different attitude toward risk than non-founder-CEOs (Fahlenbrach, 2009; Miller et al., 2011). In contrast to non-founder-CEOs, founder-CEOs are generally not risk averse and are not afraid to invest in risky projects (Busenitz and Barney, 1997; Gibson and Sanbonmatsu, 2004; Kahneman and Tversky, 1979; Kihlstrom and Laffont, 1979). One research stream explains this difference in risk-taking propensity by arguing that founder-CEOs have more psychological risk-taking characteristics than successor-CEOs (Begley and Boyd, 1988). Others argue that the tendency of founder-CEOs to be overconfident explains the difference in risk-taking behavior between founder-CEOs and non-founder-CEOs (Busenitz and Barney, 1997; Forbes, 2005).

Moreover, founder-CEOs consider their firms as their "babies or legacies" (Nelson, 2003; Wasserman, 2006; Zahra, 2005). As a result, they may also exert more effort to guarantee firm success relative to non-founder-CEOs (Jayaraman et al., 2000). While non-founder-CEOs tend to focus more on short-term actions, founder-CEOs will embrace long-term approaches (Bertrand and Mullainathan, 2003; Ranft and O'Neill, 2001; Stein, 1989; Villalonga and Amit, 2006).

Founder-CEOs may further be characterized by managerial conceit and complacency due to prior success (March and Shapira, 1987; Miller, 1991). Therefore, they may be too tightly bounded to their initial ideas and strategies while non-founder-CEOs are not constrained by their attachment to initial ideas and strategies.

Due to the differences in characteristics between founder- and non-founder-CEOs, the replacement of founder-CEOs is one of the most sensitive periods in the life-cycle of firms (Marquis and Tilcsik, 2013). It presents an opportunity for the founder-CEOs' successors to change the persistent policies in the firms they join, potentially leading to new persistent policies.

Hence, apart from the direct effect of founder-CEO replacements on slack levels (due to systematic differences between founder-CEOs and their successors), we expect that founder-CEO replacements will also weaken the relationship between initial slack levels and future slack levels—as they take advantage of this sensitive period to reduce initial founder-CEO imprints. Thus,

Hypothesis 2: The impact of the initial level of financial slack on future levels of financial slack weakens after the founder-CEO is replaced.

So far, we have assumed that all founder-CEO replacements are equal, or present the same opportunity for successor-CEOs to change founder-CEOs' imprints on slack levels. Nevertheless, we expect that the impact of founder-CEO replacements on the relationship between initial slack levels and future slack levels (that is, the stable component in slack levels) will be contingent on the tenure of founder-CEOs. Specifically, early founder-CEO replacements may weaken the relationship between initial slack levels and future slack levels more strongly than late founder-CEO replacements because of the limited institutionalizing of founder-CEO imprints when founder-CEOs are quickly replaced.

Indeed, founder-CEOs need time before their strategies, policies and practices can be institutionalized. Many authors have acknowledged that time is one of the most important drivers of founder-CEOs' influence (Boeker, 1989; Pfeffer, 1981). Studies examining institutionalization point at CEOs becoming tightly bounded to the strategies, policies and practices they once set as a first step of the institutionalization process (Staw, 1976). Afterwards, strategic actions, policies, practices and belief systems become internalized in the firm (Zucker, 1977). In this way, the legitimacy of the CEO's strategies, policies and practices increases (Pfeffer, 1981). Hence, when

founder-CEOs are replaced after a long tenure, their strategies, policies and practices may have become strongly imprinted in the firm (Guenther et al., 2015). Founder-CEOs with a short tenure before being replaced are, on the other hand, less likely to have a persistent influence on a firm's strategic actions (Boeker, 1989). Consistent with these ideas, Hoang and Gimeno (2010) show that the legitimacy of the actions of founder-CEOs will be less developed when founder-CEOs have a short tenure.

Applying this line of argument to the impact of founder-CEO replacements on the stable component of slack levels, we expect that successor-CEOs will have more discretion to change the founder-CEOs' imprint on slack levels when founder-CEOs have a short tenure and their slack levels are not heavily institutionalized yet. Thus,

Hypothesis 3: The impact of the initial level of financial slack on future levels of financial slack weakens more if founder-CEOs are replaced early-on, as compared to when they are replaced later-on.

3.4 Method

3.4.1 Data sources and sample

We construct a unique dataset comprising data on Belgian firms founded between 1996 and 1998 that are subsequently tracked for up to 15 years.[3] The Belgian research setting provides us with an important advantage (Vanacker and Forbes, 2016) because reporting requirements imposed by the Belgian government require all non-financial firms—irrespective of their size and age—to annually file detailed financial accounts (over 40 pages) in a predefined format with the National Bank of Belgium. When the financial accounts are filed with the National Bank of Belgium, they

[3] Results on each individual founding year are qualitatively similar to those based on the full sample.

are processed and checked, and subsequently made publicly available. Bureau van Dijk (BvD), one of Europe's leading electronic publishers of business information, 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 five years of no reporting data. Therefore, to eliminate this potential survivorship bias, we compile the database by identifying the firms founded between 1996 and 1998 and collecting accounting information from historical annual releases of Bel-first so that we can have the complete set of new firms and history of data across the entire sample period.

We start from the universe of limited liability firms that were legally incorporated in Belgium between 1996 and 1998. Firms had to fulfill several criteria to be part of our sample, however. First, firms should have at least one and less than 50 employees, measured in full-time equivalents, in the founding year. We remove firms with no employees from the sample to exclude "ghost" firms (or firms that only exist on paper, primarily for fiscal reasons) and firms with more than 50 employees because these are unlikely to be de novo startups and hence will have some unobservable history. Second, we exclude firms that belong to a group structure. Specifically, 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. We do so because (financial) resources are often shifted within group structures. Finally, firms could not be active in the financial and the government sector, because their operations are often influenced by regulatory issues. These selection filters result in a final sample of 4,962 Belgian firms, covering 49,418 firm-year observations. Importantly, 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. Of the 4,962 firms in our dataset, 2,347 firms are active during all sample years while 2,615 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 founder-CEO replacements (and deaths). For each the 4,962 firms this information was 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 4,962 firms, there are 1,907 firms where the founder-CEO leaves the firm in the first 15 years after founding. Of those 1,907 firms, there are 1,191 firms where the founder-CEO leaves the firm early, while there are 716 firms where the founder-CEO leaves the firm late.[4]

3.4.2 Dependent variable

Our dependent variable, *financial slack*, is measured as cash and cash equivalents scaled by total assets (Kim and Bettis, 2014; Vanacker et al., 2013, 2016). Scaling cash and cash equivalents by total assets makes slack levels more comparable across firms of different size and mitigates heteroskedasticity (Brav, 2009). We subsequently subtract the mean ratio of cash and cash equivalents to total assets for all firms operating in the same 4-digit industry as the focal firm (Bromiley, 1991). As such, financial slack represents a close estimate of excess cash resources held by firms compared to industry norms.

[4] As we detail later, early founder-CEO replacements are defined as replacements during the first six years after founding, while late founder-CEO replacements are defined as replacements after the first six years after founding.

3.4.3 Independent and moderator variables

To test hypothesis 1, we investigate the impact of initial levels of financial slack on future levels of financial slack. *Initial financial slack* is measured as the level of financial slack in firms' initial year of operation.

Founder-CEO replacement is measured by a dummy variable which equals 1 from the year of the founder-CEO replacement onwards and zero otherwise. This variable is equivalent to a founder-CEO fixed effect and captures the direct effect of founder-CEO replacements on slack levels, and relatedly captures *all* static differences between the founder-CEO and his (her) successor (including differences in management styles, psychological risk-taking attributes and overconfidence). To test hypothesis 2, however, we are primarily interested in the interaction term between initial financial slack and founder-CEO replacement.

We further make a distinction between early and late founder-CEO replacements. *Early founder-CEO replacement* is computed as a dummy variable which equals 1 from the year of the founder-CEO replacement onwards if this replacement happens in the first six years after founding and zero otherwise. *Late founder-CEO replacement* is defined as a dummy variable that equals 1 from the year of the founder-CEO replacement onwards if this replacement happens after the first six years of existence and zero otherwise. The distinction between early and late founder-CEO replacements is made based on studies of Brush (1995) and Zahra et al. (2000) where new firms are defined as firms that are six years old or younger. This distinction between early and late founder-CEO replacements also equals a median split since six years is the median age of all the firm-year observations in our sample.[5] To test hypothesis 3, we are again primarily

[5] The results, however, remain robust when the distinction between early and late founder-CEO replacements is based on replacements during/after the first five (or seven) years after founding.

interested in the interaction terms between early (late) founder-CEO replacement and initial financial slack.

3.4.4 Control variables

With regard to firm-level controls, we control for firm age, firm size, firm performance, tangibility, firm growth, capital expenditures, dividend payments, and other forms of slack.

Firm age is used since financial slack is expected to be time-dependent in its accumulation (Sharfman et al., 1988). *Firm age* is measured as the number of years since formal incorporation (Simsek et al., 2007). Because firm size will influence the ability of firms to accumulate slack, we control for firm size (George, 2005). *Firm size* is measured as the natural logarithm of total assets. *Firm performance* is operationalized as earnings before interest, taxes, depreciation and amortization (EBITDA) scaled by total assets. *Tangibility* is measured as the ratio of net property, plant and equipment to total assets. The relative growth in total assets (defined as total assets of the firm in year t minus total assets in year t-1, and this divided by total assets in year t-1) is used to measure *firm growth*. *Capital expenditures* is measured as new investments in fixed assets to total assets. *Dividend payments* is measured using a dummy variable that equals one in years where a firm pays a dividend and zero otherwise.[6]

We further control for the effect of other forms of slack. *Potential slack* is defined as the debt-to-total assets ratio (Kim and Bettis, 2014), adjusted for industry norms, and represents the remaining borrowing capacity of a firm. We multiply this measure with -1 so that higher values indicate more possibilities to acquire additional debt for future investment (or more potential slack). We also control for *recoverable slack*, defined as the sum of accounts receivable and

[6] The findings are confirmed in regression models with cash flow volatility as control variable. However, since this variable does not have a significant impact on firms' financial slack levels, we omit cash flow volatility from the regression models.

inventory on total assets adjusted for industry norms (Steensma and Corley, 2001). Recoverable slack measures the level of resources contained in current operations (Bradley et al., 2011a). This might be an important slack dimension because of its immediate impact on operations (Miller and Leiblein, 1996).

We further control for industry-year fixed effects. In this way, we also control for environmental variables (industry dynamism, industry munificence, industry complexity, industry performance, competitor size, density) that may influence the levels of financial slack firms keep (Bradley et al., 2011a).[7]

3.4.5 Econometric approach

We start by using a variance decomposition of financial slack to analyze the importance of initial financial slack levels in determining future levels of financial slack. We then progress with regression analysis. Due to the longitudinal nature of the data, we must account for correlations between observations from the same firm when estimating regression parameters. We therefore report Generalized Estimating Equations (GEEs) (Liang and Zeger, 1986).[8] GEEs allow us to estimate efficient and unbiased regression parameters for longitudinal data (Ballinger, 2004). GEEs account for unobserved heterogeneity across firms and further account for the lack of independence across observations for the same firm. GEEs permit the specification of a working correlation matrix that explicitly accounts for within-firm correlation of responses. All variables

[7] The findings are confirmed in regression models with industry dynamism, industry munificence, industry complexity, industry performance, competitor size and density as control variables next to including industry and year fixed effects separately instead of using industry-year fixed effects. However, since most of these industry variables do not have a significant impact on firms' financial slack levels, we prefer to use industry-year fixed effects.

[8] We also run additional models in which we include firm-fixed effects. However, since the main effect of the initial financial slack level—a key variable of interest—is then absorbed in the firm-fixed effects (and the variable is dropped from the model), we report the results of GEE regressions.

are standardized to facilitate the interpretation of the results and compare the economic significance of the variables.

3.5 Results

3.5.1 Descriptive statistics

Table 3.1 provides an overview of the means and standard deviations for the variables used in the empirical models, as well as correlations between these variables. It is noteworthy that firms on average hold a substantial amount of financial slack in their founding year. Founder-CEO replacements are quite common. The correlation between initial financial slack and subsequent financial slack levels is high (0.453; $p < 0.01$) providing a first indication that slack levels contain an important stable component.

[Include Table 3.1 about here]

Unreported variance inflation factors are less than the critical threshold of 10 (Belsley et al., 1980); thus, multicollinearity is unlikely to influence our multivariate results described below.

3.5.2 Hypotheses tests

To understand the relative importance of initial financial slack levels and time-varying determinants in explaining the levels of financial slack, we first conduct a variance decomposition of financial slack as recommended by Simsek et al. (2015). Table 3.2 presents the results of the variance decomposition for several specifications. The numbers for each model, excluding the last row, report the fraction of the total partial sum of squares of the respective model captured by each variable or effect.

[Include Table 3.2 about here]

Model (1) shows that the initial level of financial slack explains 16.2% of the total variation in the level of financial slack. Models (2) and (3) show that industry-year fixed effects do not explain much of the total variation in the level of financial slack. Consistent with hypothesis 1, these findings suggest that the level of financial slack contains an important stable component. Model (4) shows the results of the variance decomposition of financial slack when possible time-varying determinants of financial slack are included. These variables explain only 28.8% of the variation in the level of financial slack. Adding initial financial slack in Model (5) leads to an increase of 5.9% in the adjusted R^2 compared to Model (4). Overall, the results of the variance decomposition illustrate that the initial level of financial slack drives the level of financial slack for up to 15 years after founding. Thus, the level of financial slack includes an important stable component.

We use GEE regressions to formally test our hypotheses. Table 3.3 shows the results. Model (1) is the baseline model with only control variables. In Model (2), we add the initial level of financial slack. In Model (3), we add the interaction between initial financial slack and a founder-CEO replacement dummy. Model (4) is similar to Model (2) but adds early and late founder-CEO replacement dummies, rather than a single founder-CEO replacement dummy. Finally, Model (5) includes the interaction terms between the, respectively, early and late founder-CEO replacement dummies and the initial level of financial slack.

[Include Table 3.3 about here]

Hypothesis 1 states that the initial level of financial slack is an important determinant of future levels of financial slack. Model specifications 2-5 show that the effect of the initial level of financial slack on future levels of financial slack is positive and significant. The results are also economically significant. For instance, in model (2), a one standard deviation increase in the

initial financial slack level increases the future financial slack level by 5.5%. Thus, we find support for hypothesis 1.

Hypothesis 2 states that the influence of the initial level of financial slack on future levels of financial slack will decline after the replacement of the founder-CEO. Model (3) shows that the interaction term between the initial financial slack level and the founder-CEO replacement dummy is negative and significant ($p < 0.01$). Figure 3.1 shows the relationship between initial financial slack and future financial slack and demonstrates that this relationship is weaker after the replacement of the founder-CEO than when the founder-CEO is still in function. This provides supporting evidence for hypothesis 2.

[Include Figure 3.1 about here]

Hypothesis 3 states that the relationship between the initial level of financial slack and future levels of financial slack will particularly weaken after founder-CEOs with short tenures are replaced rather than when founder-CEOs with long tenures are replaced. Model (5) show that the interaction term between the initial financial slack level and the early founder-CEO replacement dummy is significantly ($p < 0.01$) more negative than the interaction term between the initial financial slack level and the late founder-CEO replacement dummy. Figure 3.2 indicates that the relationship between the initial financial slack level and future financial slack levels is stronger after a late founder-CEO replacement relative to an early founder-CEO replacement. Thus, we find supporting evidence for hypothesis 3.

[Include Figure 3.2 about here]

3.5.3 Endogeneity

The empirical results reported above suggest that founder-CEOs have a long-term impact on firms' financial slack levels. The specific concern, however, is that our results may be subject to a

selection bias problem since the possibility exists that founder-CEO replacements do not occur randomly. For instance, good performance in the past and the anticipation of good performance in the future may make it more likely for the founder-CEO to retain his/her position. In this case, our estimation may be biased, and any normative implications drawn from these analyses may be unsound (Heckman, 1979). We attempt to address this issue by using a number of different approaches. First, we use a propensity score matching method (Rosenbauw and Rubin, 1983). Second, we use firm-fixed effects to control for potential unobserved firm characteristics that might affect the replacement of a firm's founder-CEO. Third, we analyze the change in the impact of firm's initial financial slack level on its future financial slack levels for the firms where the founder-CEO is replaced during the first fifteen years after founding. Finally, we focus on founder-CEO deaths (Johnson et al., 1985; Nguyen and Nielsen, 2014).

Propensity score matching. We first consider the possibility of a selection bias problem that raises potential endogeneity concerns by employing the propensity score matching method. Using this method, we control for differences between firms where the founder-CEO is replaced during the first fifteen years after founding and those where this is not the case. We therefore first identify 1,907 firm-year observations in which firm's founder-CEO is replaced, and we subsequently match these observations with firm-year observations of firms in which the founder-CEO stays in the firm during the first fifteen years after founding. A probit model that includes year and all control variables of Table 3.3 except firm growth is used to calculate the propensity score (i.e. the probability that the founder-CEO leaves the firm).[9,10]

[9] Firm growth is measured as the relative growth in total assets. Therefore, if we would include firm growth in the probit model, we cannot calculate the probability of a founder-CEO replacement for the 271 observations where the founder-CEO leaves the firm in the first year of observation and, as a consequence, these firm-year observations cannot be matched. We also do not lag the control variables in the probit model for the same reason. However, results remain qualitatively similar if we include firm growth in the probit model and if we lag the control variables.

[10] Firm age, one of the control variables used to calculate the propensity score, not only proxies firm's life-cycle phase but also founder-CEO tenure which may influence the likelihood of founder-CEO replacement.

Table 3.4 provides the results of GEE regressions using the matched sample. Consistent with the results in Table 3.3, model (1) shows that the interaction term between initial financial slack and the founder-CEO replacement dummy is negative and significant (β = -0.012; $p < 0.01$), while model (2) demonstrates that the interaction term between the initial level of financial slack and the early founder-CEO replacement dummy is significantly ($p < 0.01$) more negative than the interaction term between the initial level of financial slack and the late founder-CEO replacement dummy. The values of the coefficients on the interaction terms in model (1) and (2) are even somewhat more negative than the corresponding coefficients in models (3) and (5) of Table 3.3. This alleviates the concern that our main findings may be driven by a selection bias problem.

*** Include Table 3.4 about here ***

Firm fixed effects. Next, we use firm-fixed effects regressions to control for potential unobserved time-invariant endogeneity concerns.[11] The estimation results of these firm-fixed effects regressions that are reported in Table 3.5 are consistent with our previous analyses and support the view that founder-CEOs have a long-term impact on firms' financial slack level due to institutionalization.

*** Include Table 3.5 about here ***

Firms with founder-CEO replacements. To further address potential endogeneity concerns, we perform a subsample analysis to see whether there is a discernible difference in the influence of firms' initial financial slack level on their future financial slack levels after the replacement of the founder-CEO. In line with previous studies that examine changes in various firm features around a critical firm level event (e.g., Siegel and Simons, 2010; Sheen, 2014; Lee

[11] Note that the main effect of initial financial slack is now absorbed in the firm fixed effects, which also control for any other unmeasured but stable firm characteristic that influences new firms' financial slack level.

et al., 2016), we restrict our sample to the subset of firms where the founder-CEO left the firm during the first fifteen years after founding.[12] We then examine whether the influence of firms' initial financial slack level on their future financial slack levels remains the same after the replacement of the founder-CEO. If we find a difference in the initial financial slack-future financial slack relationship within a firm between the pre-founder-CEO change period and post-founder-CEO change period, our baseline results can be confirmed with a reduced concern of an endogenous selection problem.

*** Include Table 3.6 about here ***

Table 3.6 provides the results of GEE regressions using the subsample of firms where the founder-CEO left the firm during the first fifteen years after founding. These results are in line with our argument that founder-CEOs influence firms' financial slack level through the initial financial slack level they decide upon.

Founder-CEO deaths. Finally, we focus on founder-CEO deaths (Johnson et al., 1985; Nguyen and Nielsen, 2014). The idea is that founder-CEO deaths occur randomly and are likely to be exogenous to current firm and market conditions. Results of founder-CEO death analyses allow us to provide an answer, based on evidence that is very likely to be causal, to the question whether founder-CEOs influence the financial slack level in firms through the initial financial slack level they decide upon and to the question whether the institutionalization of the founder-CEOs' norms, procedures etc. is an important mechanism behind the stable component of firms' financial slack level.

[12] We also use random subsamples of the subset of firms where the founder-CEO left the firm during the first fifteen years after founding. Results remain qualitatively similar when using these alternative subsets.

Table 3.7 gives the results of the founder-CEO death analyses. The interaction term between initial financial slack and the founder-CEO death dummy and the interaction terms between initial financial slack and the, respectively, early and late founder-CEO death dummy are not significant in any of the models.[13]

*** Include Table 3.7 about here ***

In sum, overall evidence found from these approaches suggests that founder-CEOs may indeed influence the financial slack level in firms through the initial financial slack level they decide upon and drive the stable component of firms' financial slack level due to the institutionalization of his/her values, norms, procedures etc.

3.5.4 Robustness tests [14]

Our results suggest that slack levels contain an important stable component (thus, initial slack levels are strongly correlated with future slack levels) and that founder-CEOs have a long-lasting impact on the slack levels in their firms. Founder-CEO replacements (and particularly early replacements) weaken the relationship between initial slack levels and future slack levels.

A first potential concern is that our results may be driven by small firms that may have limited operational activities but dominate the population of new firms (and thus our sample). Indeed, our sample firms employ on average about six employees and the median firm employs three people (all in full-time equivalents). We therefore analyze subsamples of firms with more than one (five and ten) employee(s) in the year of startup. The results remain largely similar for

[13] Note that only 19 of the 1,907 founder-CEO replacements are caused by the death of the founder-CEO. Six of these deaths occur early (i.e. during the first six years after founding), while 13 of these deaths occur late (i.e. after the first six years after founding). As a consequence, results of these analyses have to be taken with caution.

[14] The results of the robustness tests are not reported in detail here due to space considerations but are available upon request.

each subsample, which indicates that our findings are not driven by the large group of small firms in our sample.

A second concern is that the large average impact of initial financial slack on future financial slack is driven by a large influence of initial financial slack during the early years in the firm's life cycle, despite a minimal influence in the later years. We address this issue by analyzing a subsample in which we only retain the observations when firms or six years or older and a subsample in which we only retain the observations when firms are 11 years or older. The results indicate that firms' financial slack level in their initial year of operation remains a statistically and economically significant determinant of firms' future financial slack levels. We further find that founder-CEO replacements (and particularly early replacements) weaken the relationship between initial financial slack levels and future financial slack levels. When we address this issue by adding the interaction between initial financial slack and firm age in similar regression models as in Table 3.3, results also remain qualitatively similar.

3.6 Discussion and conclusion

It is well-known that slack resources influence firm performance (Bradley et al., 2011b; Bromiley, 1991; George, 2005; Kim and Bettis, 2014; Tan and Peng, 2003), firm growth (Mishina et al., 2004; Bradley et al., 2011c), and firm survival (Levinthal, 1991; Paeleman and Vanacker, 2015) among other firm outcomes, by playing both a stabilizing and adaptive role (Cyert and March, 1963). However, despite the importance of slack for a broad range of firm outcomes, our theoretical and empirical understanding of how these resources evolve in firms remains very limited. In this study, we draw on imprinting theory to examine the level of slack resources in firms for a period of up to 15 years after startup.

While previous research has described how managers unlock slack resources (particularly slack that is highly discretionary in nature) and hence portray slack as dynamic in nature, we argue and find that slack levels contain an important stable component. We argue that founder-CEO imprints represent an important explanation for the stability in slack levels. Consistent with this idea, we find that the relationship between initial slack levels and future slack levels weakens after the departure of founder-CEOs. This finding is especially strong when founder-CEOs have a short tenure, because there has been limited time for institutionalizing processes to occur in these cases. Overall, our work offers novel insights into slack levels in firms, in general, and the impact of founder-CEOs and their successors, in particular.

Theoretically, slack resources have been portrayed as being either more or less discretionary in nature (Bourgeois, 1981; Bourgeois and Singh, 1983; Sharfman et al., 1988). Financial slack is often assumed to be highly discretionary in nature and thus easy for managers to redeploy (George, 2005). However, our findings suggest that managers may find it difficult—or may be unwilling—to redeploy supposedly high discretionary slack because pre-existing policies, practices and behaviors push managers to keep specific levels of slack. Our findings suggest a need to re-conceptualize slack, where the re-deployability of slack resources is not only determined by the characteristics of the resources involved (such as "excess cash" or "excess labor") and the context in which these resources are deployed (such as dynamic versus stable environments) but also by managers' inclination—conscious or unconscious—to maintain specific levels of slack.

In addition, the antecedents and consequences of the stable and dynamic components of slack levels, which we identified in this study, may be fundamentally different, but most empirical studies do not distinguish between these two components. An excessively large stable component of slack may reflect inefficiencies and agency issues, while the dynamic component

may be driven by managers that are actively building up slack and deploying slack when needed to buffer their firms or pursue new opportunities as highlighted in the behavioral theory of the firm.

Our study also contributes to the literature on the impact of founder-CEOs and their successors. A significant stream of research in the management field has focused on identifying the relative importance of firm and industry effects (McGahan and Porter, 1997; Short et al., 2009) and more recently, the importance of CEO effects on firm performance. However, the existence of a CEO effect is highly debated (Fitza, 2014; Quigley and Graffin, 2016). To better understand if and how CEOs influence firm performance, it is crucial to understand how CEOs influence resource accumulation and deployment, as we do in this study. We find evidence that slack levels are very stable as long as founder-CEOs remain in position, but when they leave, their successors significantly weaken the stable component in slack resources by changing the slack policies or practices of founder-CEOs.[15]

Our study also adds to a rich imprinting literature following the seminal work of Stinchcombe (1965). As highlighted by Simsek et al. (2015: pp. 304-305) in their recent review of the imprinting literature: "the dominant conception… is that environment "stamps" itself upon individuals, organizations, and other entities" and that this "implies primarily a top-down mechanism by which environments, institutions, and other macrolevel collectives act as imprinters". While we are certainly not the first to show that founder-CEOs act as imprinters (Beckman and Burton, 2008; Boeker, 1989), we do provide new evidence that founder-CEOs act as imprinters by controlling for macro-level collectives (Indeed, all new firms in our sample are founded under the same environmental conditions). Our longitudinal research design further

[15] In unreported results, we find evidence that although founder-CEO successors weaken the relationship between initial slack levels and subsequent slack levels, after this shift, slack levels again remain very stable.

allows us to directly assess the impact of environmental changes on imprint trajectories. A variance decomposition analysis, however, shows that industry-time effects explain surprisingly little of the total variation of slack levels; rather, slack levels still contain an important stable component as firms age.

In addition, Simsek et al. (2015: p. 308) indicate that imprints are unlikely to "metamorphose in a linear fashion". Our theory and evidence is consistent with this view. Specifically, early founder-CEO replacements provide more opportunities for the transformation of imprints, relative to late founder-CEO replacements. Thus, not all founder-CEO replacements represent equally "sensitive periods" (Marcquis and Tilcsik, 2013: p. 197). Relatedly, imprinting influences may differ across firms even when they operate under the same temporal and special conditions and one potential reason for this might be differences in slack levels across firms (Simsek et al., 2015). However, our study shows that slack levels themselves get imprinted. Hence, founder-CEOs, who are imprinters themselves, may not actively use slack resources to insulate their firms from other imprinting influences.

Despite its contributions, this study is not without limitations that may also present fruitful avenues for future research. First, the stable component in slack levels can be a result of target slack policies that are consciously set at founding and subsequently become institutionalized, or can be the result of slack levels that are unconsciously created at founding and become the "rule" due to institutionalization. Future studies could explore this difference by using methodologies that allow for a more fine-grained understanding of how managers utilize slack resources and what factors facilitate or constrain their use of slack resources. Second, through the inclusion of a founder-CEO dummy (or fixed effect) in the regressions we implicitly control for *all* founder-CEO characteristics that remain (largely) stable over time. Since we lack detailed information on the founder-CEO, we cannot examine the impact of founder-CEO characteristics on firms' slack

levels. The availability of such data would allow us to estimate the relative importance of specific CEO characteristics on firms' slack levels. Moreover, it might also be interesting to examine how (founder-)CEO characteristics moderate the impact of distinct slack resources on distinct firm outcomes.

Taken together, this study provides a novel theoretical perspective and first-time empirical evidence on the persistence of slack levels in firms. We draw on the imprinting literature and show that slack levels remain surprisingly stable. The results further suggest that founder-CEOs are an important factor explaining initial slack levels and the subsequent stability of slack levels due to institutionalization. Our results call for more research on how managers actually use slack resources and how pre-existing policies, practices and behaviors may constrain managers to use available slack.

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Figures

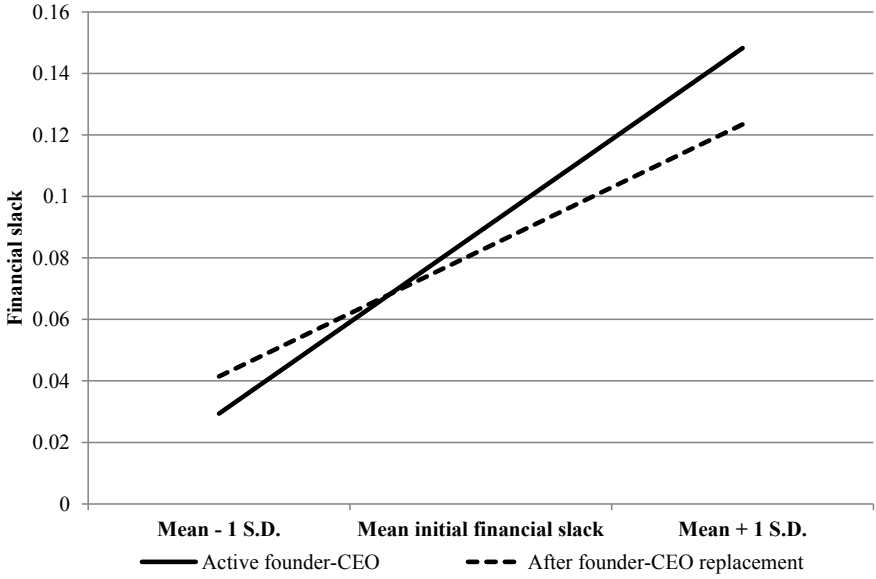

Figure 3.1 Moderating effect of founder-CEO replacement on the relationship between initial financial slack and financial slack

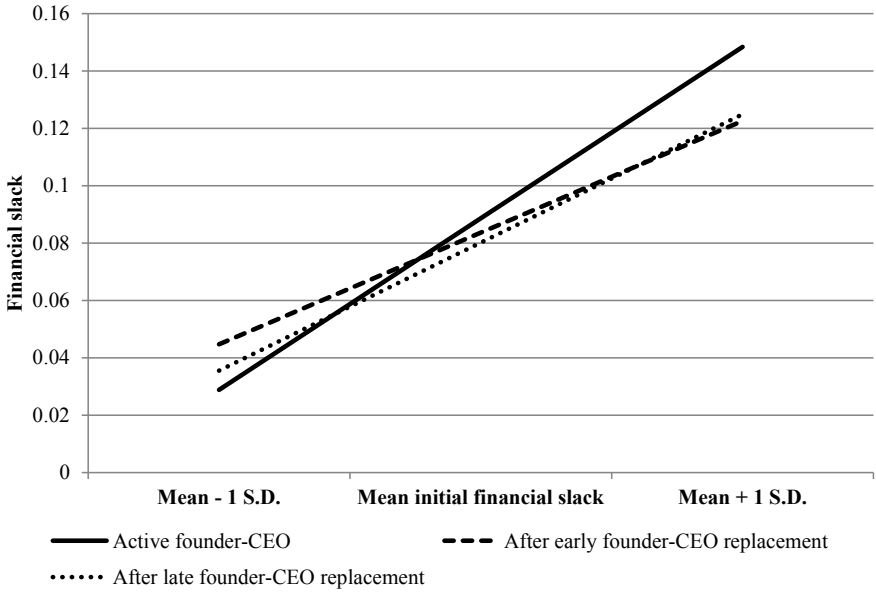

Figure 3.2 Moderating effect of early versus late founder-CEO replacement on the relationship between initial financial slack and financial slack

Tables

Table 3.1 Descriptive statistics and correlations

	Variable			*Correlations*														
		Mean	*SD*	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*	*(14)*	*(15)*	*(16)*
1.	Financial slack	0.087	0.178	1.000															
2.	Initial financial slack	0.079	0.153	0.453	1.000														
3.	Founder-CEO replacement	0.273	—	0.002	-0.020	1.000													
4.	Early founder-CEO replacement	0.205	—	-0.010	-0.022	0.831	1.000												
5.	Late founder-CEO replacement	0.067	—	0.021	0.000	0.438	-0.136	1.000											
6.	Founder-CEO death	0.002	—	0.006	0.015	0.082	0.059	0.050	1.000										
7.	Early founder-CEO death	0.001	—	0.004	0.011	0.060	0.072	-0.010	0.732	1.000									
8.	Late founder-CEO death	0.001	—	0.006	0.011	0.056	0.009	0.084	0.680	-0.001	1.000								
9.	Firm age	6.732	4.265	0.093	0.012	0.319	0.158	0.312	0.036	0.015	0.037	1.000							
10.	Firm size	5.838	1.416	-0.093	-0.076	0.149	0.112	0.084	0.003	-0.003	0.008	0.263	1.000						
11.	Firm performance	0.119	0.113	0.108	0.030	-0.076	-0.054	-0.048	-0.005	-0.003	-0.004	-0.130	-0.080	1.000					
12.	Tangibility	0.303	0.255	-0.310	-0.183	-0.024	-0.005	-0.033	-0.019	-0.015	-0.012	-0.030	0.055	0.127	1.000				
13.	Potential slack	0.039	0.251	0.413	0.205	0.073	0.038	0.070	0.001	-0.008	0.011	0.238	-0.137	0.100	-0.218	1.000			
14.	Recoverable slack	0.008	0.235	-0.269	-0.088	0.002	0.002	0.002	0.019	0.015	0.012	-0.024	0.012	-0.097	-0.364	-0.192	1.000		
15.	Firm growth	0.071	0.262	0.022	0.048	-0.022	-0.012	-0.019	-0.004	-0.002	-0.004	-0.149	0.105	0.111	-0.019	-0.123	0.028	1.000	
16.	Capital expenditures	0.025	0.040	-0.081	-0.017	-0.087	-0.064	-0.051	-0.012	-0.010	-0.007	-0.265	-0.075	0.085	0.188	-0.121	-0.090	0.369	1.000
17.	Dividend payments	0.100	—	0.137	0.054	0.093	0.053	0.081	0.004	0.016	-0.011	0.226	0.167	-0.059	-0.077	0.052	-0.007	-0.019	-0.068

Notes:

[a] Number of observations = 49,418. Correlations above [0.010] are significant at $p < 0.05$. Industry-year dummies are not reported.

[b] Log-transformed variable.

Variables 3, 4, 5, 6, 7, 8, and 17 are binary, thus their correlations should be interpreted with care.

Table 3.2 Variance decomposition of financial slack

	Financial slack				
Variable	(1)	(2)	(3)	(4)	(5)
Initial financial slack	1.000	.	0.819	.	0.252
Firm age	.	.	.	0.002	0.002
Firm size	.	.	.	0.010	0.005
Firm performance	.	.	.	0.039	0.039
Tangibility	.	.	.	0.318	0.220
Potential slack	.	.	.	0.162	0.121
Recoverable slack	.	.	.	0.256	0.188
Firm growth	.	.	.	0.005	0.002
Capital expenditures	.	.	.	0.004	0.005
Dividend payments	.	.	.	0.031	0.024
Founder-CEO replacement	.	.	.	0.002	0.001
Industry-year FE	.	1.000	0.181	0.173	0.140
Adj. R^2	0.162	0.021	0.176	0.288	0.347

Table 3.3 GEE regression results for financial slack

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Control variables					
Firm age	0.020**	0.017*	0.017*	0.017*	0.017*
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
Firm size	-0.011***	-0.010***	-0.009***	-0.010***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm performance	0.009***	0.009***	0.009***	0.009***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tangibility	-0.051***	-0.047***	-0.047***	-0.047***	-0.047***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Potential slack	0.026***	0.025***	0.025***	0.025***	0.025***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Recoverable slack	-0.028***	-0.027***	-0.026***	-0.027***	-0.026***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm growth	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Capital expenditures	-0.002***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Dividend payments	0.008***	0.008***	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Founder-CEO replacement	-0.003***	-0.003***	0.001		
	(0.001)	(0.001)	(0.001)		
Independent variables and interaction terms					
Initial financial slack		0.055***	0.059***	0.055***	0.060***
		(0.002)	(0.002)	(0.002)	(0.002)
Initial financial slack * Founder-CEO replacement			-0.010***		
			(0.001)		
Early founder-CEO replacement				-0.002*	0.002**
				(0.001)	(0.001)
Late founder-CEO replacement				-0.002***	0.000
				(0.001)	(0.001)
Initial financial slack * Early founder-CEO replacement					-0.010***
					(0.001)
Initial financial slack * Late founder-CEO replacement					-0.004***
					(0.001)
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	44,456	44,456	44,456	44,456	44,456
Number of firms	4,447	4,447	4,447	4,447	4,447
Wald chi-square	7,413.860***	9,005.41***	9,129.820***	9,006.400***	9,133.340***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown.
Standard errors are in parentheses.

Table 3.4 Propensity score matching

Dependent Variable	Financial slack	
	(1)	(2)
Initial financial slack	0.061***	0.061***
	(0.002)	(0.002)
Founder-CEO replacement	0.002**	
	(0.001)	
Initial financial slack * Founder-CEO replacement	-0.012***	
	(0.001)	
Early Founder-CEO replacement		0.003**
		(0.001)
Late Founder-CEO replacement		0.000
		(0.001)
Initial financial slack * Early founder-CEO replacement		-0.012***
		(0.001)
Initial financial slack * Late founder-CEO replacement		-0.005***
		(0.001)
Controls	Yes	Yes
Industry-year FE	Yes	Yes
N (Firm-years)	34,705	34,705
Number of firms	3,073	3,073
Wald chi-square	7,077.800***	7,081.030***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Table 3.5 Firm-fixed effects regressions

Dependent Variable	Financial slack	
	(1)	(2)
Founder-CEO replacement	0.002*	
	(0.001)	
Initial financial slack * Founder-CEO replacement	-0.011***	
	(0.001)	
Early Founder-CEO replacement		0.004***
		(0.001)
Late Founder-CEO replacement		0.000
		(0.001)
Initial financial slack * Early founder-CEO replacement		-0.011***
		(0.002)
Initial financial slack * Late founder-CEO replacement		-0.004***
		(0.001)
Controls	Yes	Yes
Industry-year FE	Yes	Yes
N (Firm-years)	44,456	44,456
Number of firms	4,447	4,447
Adjusted R^2	0.625	0.625

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Table 3.6 Subsample of firms where the founder-CEO is replaced

Dependent Variable	Financial slack	
	(1)	(2)
Initial financial slack	0.064***	0.065***
	(0.003)	(0.003)
Founder-CEO replacement	0.001	
	(0.001)	
Initial financial slack * Founder-CEO replacement	-0.011***	
	(0.001)	
Early Founder-CEO replacement		0.002
		(0.001)
Late Founder-CEO replacement		0.000
		(0.001)
Initial financial slack * Early founder-CEO replacement		-0.011***
		(0.001)
Initial financial slack * Late founder-CEO replacement		-0.004***
		(0.001)
Controls	Yes	Yes
Industry-year FE	Yes	Yes
N (Firm-years)	21,151	21,151
Number of firms	1,869	1,869
Wald chi-square	4,404.080***	4,408.240***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Table 3.7 Influence of founder-CEO death

Dependent Variable	Financial slack	
	(1)	(2)
Initial financial slack	0.055***	0.055***
	(0.002)	(0.002)
Founder-CEO death	-0.001	
	(0.001)	
Initial financial slack * Founder-CEO death	0.000	
	(0.001)	
Early Founder-CEO death		-0.002
		(0.001)
Late Founder-CEO death		0.000
		(0.001)
Initial financial slack * Early founder-CEO death		0.001
		(0.002)
Initial financial slack * Late founder-CEO death		-0.001
		(0.001)
Controls	Yes	Yes
Industry-year FE	Yes	Yes
N (Firm-years)	44,456	44,456
Number of firms	4,447	4,447
Wald chi-square	8,994.750***	8,996.120***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Internet Appendix for "Stubborn and persistent: The evolution of slack resources in new firms"

This appendix contains additional tables that are mentioned and described in the 'robustness tests' section of our paper but were not reported there to preserve space.

Figure IA.3.1 presents the impact of initial financial slack on future financial slack across the years by plotting the yearly standardized beta coefficient of the initial financial slack variable.

Table IA.3.1 examines whether the results are potentially driven by very small firms that may have limited operational activities but dominate the population of new firms (and our sample).

Table IA.3.2 investigates whether the large average impact of initial financial slack on future financial slack is driven by a large influence of initial financial slack during the early years in the firm's life-cycle, despite a minimal influence in the later years.

Figure IA.3.1 Evolution of yearly coefficient initial financial slack

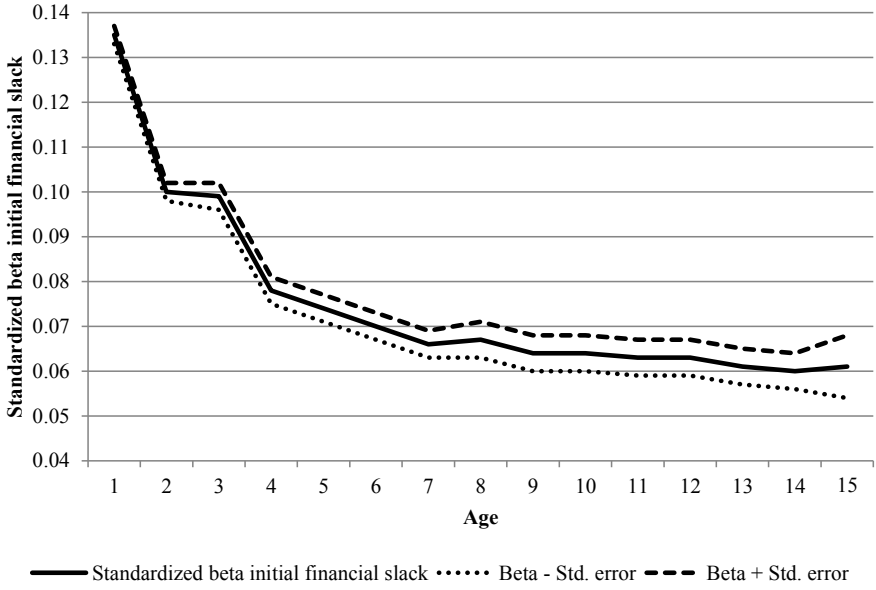

Table IA.3.1 Subsamples of firms with different cut-offs for minimum number of employees

Panel A: Subsample with observations when firms have more than one employee in the year of startup

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.075***	0.056***	0.061***	0.056***	0.060***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Founder-CEO replacement		-0.002*	0.002		
		(0.001)	(0.001)		
Initial financial slack * Founder-CEO replacement			-0.010***		
			(0.001)		
Early founder-CEO replacement				0.000	0.002
				(0.001)	(0.001)
Late founder-CEO replacement				-0.002**	0.000
				(0.001)	(0.001)
Initial financial slack * Early founder-CEO replacement					-0.007***
					(0.002)
Initial financial slack * Late founder-CEO replacement					-0.006***
					(0.001)
Controls	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	25,464	25,464	25,464	25,464	25,464
Number of firms	2,563	2,563	2,563	2,563	2,563
Wald chi-square	2,603.850***	5,710.860***	5,779.080***	5,715.250***	5,786.730***

Panel B: Subsample with observations when firms have more than five employees in the year of startup

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.077***	0.063***	0.063***	0.057***	0.061***
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Founder-CEO replacement		-0.011***	-0.002		
		(0.002)	(0.002)		
Initial financial slack * Founder-CEO replacement			-0.011***		
			(0.002)		
Early founder-CEO replacement				-0.002	0.000
				(0.002)	(0.002)
Late founder-CEO replacement				-0.005***	-0.002
				(0.002)	(0.002)
Initial financial slack * Early founder-CEO replacement					-0.004*
					(0.003)
Initial financial slack * Late founder-CEO replacement					-0.013***
					(0.002)
Controls	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	7,735	7,735	7,735	7,735	7,735
Number of firms	776	776	776	776	776
Wald chi-square	1,492.760***	2,510.540***	2,510.540***	2,487.140***	2,541.740***

Panel C: Subsample with observations when firms have more than ten employees in the year of startup

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.078***	0.059***	0.066***	0.059***	0.066***
	(0.007)	(0.006)	(0.007)	(0.006)	(0.007)
Founder-CEO replacement		-0.002	0.003		
		(0.003)	(0.003)		
Initial financial slack * Founder-CEO replacement			-0.014***		
			(0.004)		
Early founder-CEO replacement				0.002	0.006*
				(0.003)	(0.003)
Late founder-CEO replacement				-0.004*	-0.002
				(0.002)	(0.002)
Initial financial slack * Early founder-CEO replacement					-0.013***
					(0.004)
Initial financial slack * Late founder-CEO replacement					-0.007**
					(0.003)
Controls	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	3,297	3,297	3,297	3,297	3,297
Number of firms	325	325	325	325	325
Wald chi-square	1,319.500***	1,746.730***	1,774.470***	1,751.840***	1,780.920***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Table IA.3.2 Influence of aging

Panel A: Subsample with observations when firms are six years or older

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.064***	0.049***	0.053***	0.049***	0.053***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Founder-CEO replacement		-0.003***	-0.001		
		(0.001)	(0.001)		
Initial financial slack * Founder-CEO replacement			-0.007***		
			(0.001)		
Early founder-CEO replacement				-0.002	0.001
				(0.002)	(0.002)
Late founder-CEO replacement				-0.002***	-0.001
				(0.001)	(0.001)
Initial financial slack * Early founder-CEO replacement					-0.006***
					(0.002)
Initial financial slack * Late founder-CEO replacement					-0.003***
					(0.001)
Controls	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	28,401	28,401	28,401	28,401	28,401
Number of firms	3,473	3,473	3,473	3,473	3,473
Wald chi-square	1,727.800***	5,068.850***	5,098.050	5,070.190***	5,099.560***

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

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.060***	0.047***	0.053***	0.047***	0.053***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Founder-CEO replacement		-0.002	0.001		
		(0.002)	(0.002)		
Initial financial slack * Founder-CEO replacement			-0.007***		
			(0.002)		
Early founder-CEO replacement				-0.001	0.002
				(0.003)	(0.003)
Late founder-CEO replacement				-0.002	0.000
				(0.001)	(0.001)
Initial financial slack * Early founder-CEO replacement					-0.007**
					(0.003)
Initial financial slack * Late founder-CEO replacement					-0.003***
					(0.001)
Controls	No	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	12,364	12,364	12,364	12,364	12,364
Number of firms	2,858	2,858	2,858	2,858	2,858
Wald chi-square	2,603.850***	2,226.700***	2,235.990***	2,227.620***	2,236.770***

Panel C: Initial financial slack – firm age interaction

Dependent Variable	Financial slack				
	(1)	(2)	(3)	(4)	(5)
Initial financial slack	0.055***	0.059***	0.067***	0.060***	0.068***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Firm age	0.020**	0.017*	0.020**	0.017*	0.020**
	(0.010)	(0.009)	(0.009)	(0.009)	(0.009)
Founder-CEO replacement	-0.003***	-0.003***	-0.001		
	(0.001)	(0.001)	(0.001)		
Initial financial slack * Firm age			-0.014***		-0.014***
			(0.001)		(0.001)
Initial financial slack * Founder-CEO replacement			-0.005***		
			(0.001)		
Early founder-CEO replacement				-0.002*	0.000
				(0.001)	(0.001)
Late founder-CEO replacement				-0.002***	-0.002**
				(0.001)	(0.001)
Initial financial slack * Early founder-CEO replacement					-0.006***
					(0.001)
Initial financial slack * Late founder-CEO replacement					-0.001
					(0.001)
Controls	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes
N (Firm-years)	44,456	44,456	44,456	44,456	44,456
Number of firms	4,447	4,447	4,447	4,447	4,447
Wald chi-square	7,413.860***	9,005.41***	9,257.320***	9,006.400***	9,266.330***

Notes:
Conservative two-tailed tests, where * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standardized regression coefficients are shown. Standard errors are in parentheses.

Chapter 4:
The capital structure of business start-ups across Europe: The effect of a fresh start policy*

Jürgen Hanssens[a], Marc Deloof[b], Tom Vanacker[a]

ABSTRACT

We examine cross-country differences in the capital structure of start-ups in their initial year of operation, focusing on countries' fresh start policy—the possibility for bankrupt entrepreneurs to discharge their outstanding credit obligations. To do so, we employ a unique dataset of 2,849,997 start-ups from 26 European countries founded between 2005 and 2012. Using a difference-in-differences approach to exploit country-level changes in the availability of a fresh start, we find that start-ups founded after the implementation of a fresh start policy use less debt than start-ups founded before the implementation of a fresh start policy. In sum, our results suggest that the possibility of a fresh start in a country reduces access to debt financing for start-ups.

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4.1 Introduction

The large number of new firms that go bankrupt shortly after founding has increased concerns among policy makers about lengthy bankruptcy procedures, social stigma and lack of support for bankrupt entrepreneurs (Wymenga et al., 2014). Policy makers across the world often want to provide honest bankrupt entrepreneurs with a second chance and have adopted or consider adopting a fresh start policy. Such a policy increases debtor protection by permitting bankrupt entrepreneurs to discharge their outstanding credit obligations after a certain period of time (Armour and Cumming, 2008). While a growing literature points to the important impact of debtor protection on entrepreneurship and the credit availability to these entrepreneurs (e.g., Armour and Cumming, 2008; Djankov et al., 2007; Shleifer and Vishny, 1997), to date, the effect of a fresh start policy on the credit availability to start-ups remains largely unexplored. We address these issues by investigating how a fresh start policy influences start-ups' capital structure using a novel, unique data set of 2,849,997 start-ups founded in 26 European countries between 2005 and 2012.

The availability of a fresh start is the most frequently discussed aspect of a country's personal bankruptcy laws (Efrat, 2002; White, 2005). Personal bankruptcy laws are expected to be particularly powerful in shaping entrepreneurs' (and financiers') preferences for demanding (supplying) debt financing since financiers often require personal guarantees from entrepreneurs. Moreover, prior to incorporation, entrepreneurs typically have to rely on personal financing sources, which are directly linked to personal bankruptcy laws (Armour and Cumming, 2008). How a fresh start policy influences start-ups' capital structure remains ambiguous from a theoretical perspective. On the one hand, in countries where personal bankruptcy laws offer a fresh start from pre-bankruptcy debt, personal bankruptcy reduces the amount of assets financiers

can seize in case of bankruptcy. It can therefore be expected that financiers in these countries will provide less debt. On the other hand, a fresh start makes debt financing more attractive for entrepreneurs by permitting them to re-enter the economy quickly after a business failure (Ayotte, 2007; Georgakopoulos, 2002; Landier, 2004). Since start-ups are informationally opaque firms and therefore face difficulties in obtaining external finance (Berger and Udell, 1998), we expect that the negative effect of a fresh start policy on the supply of credit will more than offset the positive effect on the demand for credit.

We discover a large heterogeneity in start-ups' capital structure across countries. Therefore, we start by providing first-time evidence on the determinants of start-ups' capital structure based on a multi-country sample and examine the effect of a fresh start policy in explaining cross-country differences in start-ups' capital structure more in specific. Using a difference-in-differences methodology, we further exploit country-level changes in the adoption of a fresh start policy. We find that the leverage ratio of start-ups founded after the implementation of a fresh start policy is significantly lower compared with what one would expect without the implementation of a fresh start policy. This finding is robust to several alternative specifications, including a longitudinal analysis where we mitigate the concern of a potential adverse selection problem.

This study relates and contributes to several branches of literature. First, we add to the literature on the effects of creditor/debtor protection (Djankov et al., 2007; Shleifer and Vishny, 1997). While prior studies have examined the impact of cross-sectional variation in personal bankruptcy laws across US states (e.g., Berger et al., 2011; Berkowitz and White, 2004; Cumming and Li, 2013; Gropp et al., 1997) and of variation in personal bankruptcy laws across US states over time (e.g., Cerqueiro and Penas, 2016), we are the first to exploit the effect of a fresh start policy implementation in a country's personal bankruptcy laws on start-ups' capital

structure. Our study is therefore related to a growing literature that examines the effects of changes in the financial and regulatory environment on start-ups (Kerr and Nanda, 2009; Klapper et al., 2006).

Second, we add to the entrepreneurial finance literature. To date, what we know about the capital structure of start-ups is based upon samples from individual countries (e.g., Cerqueiro and Penas, 2016; Cosh et al., 2009; Cumming, 2005, 2006; Robb and Robinson, 2014). This research ignores cross-country differences that may influence the costs and benefits of particular financing sources for start-ups. Institutions (e.g., legal frameworks) vary significantly across countries (Djankov et al., 2003, 2007, 2008; La Porta et al., 1998). These variations suggest a need to empirically examine the effect of variations in the institutional environment on start-ups' capital structure. In this study, we provide first-time evidence on the determinants of start-ups' capital structure using a multi-country sample. While several studies have examined the impact of country-specific factors on capital structure in listed and private firms (e.g., Demirgüç-Kunt and Maksimovic, 1999; Fan et al., 2012), to the best of our knowledge, we are also the first to examine the impact of country-specific factors on start-ups' capital structure more in specific.

The remainder of the study is organized as follows. Section 2 describes the data. Section 3 presents the empirical results. Section 4 concludes.

4.2 Data

4.2.1 Sample

Firm-level accounting data for this study come from *Amadeus*. The *Amadeus* database is compiled by Bureau van Dijk (BvD), one of Europe's leading electronic publishers of business information. Disclosure requirements in Europe require firms to publish annual accounting

information. BvD collects accounting information from a variety of sources, such as official registers and regulatory bodies, annual reports, private correspondence, firm websites and news reports. BvD further harmonizes the financial accounts to allow accurate cross-country comparisons.

Firms had to fulfill several criteria to be part of our sample. First, we include all firms that were legally incorporated in Europe in the 2005-2012 period. To do so, we use different Amadeus releases.[1] The start-ups of 2005, for instance, are collected using the 2007 and 2008 releases, while the start-ups of 2006 are collected using the 2008 and 2009 releases. Start-ups of all founding years are also collected using the most recent Amadeus release that is available (the 2015 release) as a further cross-check. Second, we only include independent start-ups 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. Third, we exclude financial and government-owned firms because the financing of these firms may be influenced by regulatory issues.

To calculate missing values and to ensure the accuracy of the accounting variables, we compare them to values computed using accounting identities in a similar way as Faccio et al. (2011). For example, when "shareholders funds" are missing, we compute it by summing "capital", and "other". Similarly, we compute "non-current liabilities" by summing "long-term debt", "other non-current liabilities", and "provisions", while we calculate "current liabilities" by summing "loans", "creditors" (payables) and "other". If the value of "shareholders funds", "non-current liabilities" or "current liabilities" is missing in *Amadeus* but we are able to compute it

[1] The Amadeus releases are subject to a survivorship bias because BvD removes firms after several years of no reporting. Our current approach minimizes survivorship bias (e.g., Faccio et al., 2011).

using one of the accounting identities, we use the computed value. We eliminate observations whenever the *Amadeus* value and the computed value differ by more than 5%. This process affects only a very small number of observations (11,256), but it is important to remove possible data errors. In a number of cases (32,698), we discover a very small difference between the *Amadeus* value and our computed value which is usually due to *Amadeus* having added or dropped decimals and is thus not consequential. When this occurs, we use the number originally reported in *Amadeus*.

We aim to keep the number of countries high enough but also to have a reasonable number of start-ups in each country. We therefore further require that every country in our sample has at least 500 start-ups over the study period. The final sample contains 2,849,997 start-ups firms from 26 European countries.

The firm-level accounting data from the *Amadeus* database is subsequently supplemented with country-level data that come from reports of the European Commission, the International Insolvency Institute, the Worldwide Governance Index and different data sources of the World Bank.

4.2.2 Variables

Our dependent variable *leverage* is measured as the ratio of total bank debt on total assets, where total bank debt includes loans and long-term debt (e.g., Faccio et al., 2011).[2]

Our key independent variable is the availability of a fresh start in a country's personal bankruptcy laws. Following Armour and Cumming (2008), we carried out a search of all personal bankruptcy law changes across all of the countries and years covered by our sample using data

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

from the International Insolvency Institute and documents of the European Commission. *Fresh start* is defined as a dummy variable which equals one if a fresh start is available in a country's personal bankruptcy laws and zero otherwise.

Several firm-level variables that are consistently shown in prior research to be important capital structure determinants are included in our analyses, including firm size, profitability, tangibility and growth potential (e.g., Brav, 2009; Rajan and Zingales, 1995; Titman and Wessels, 1988). *Firm size* is measured as the natural logarithm of total assets (in thousands EUR), expressed in 2010 prices[3]. *Profitability* is measured as other shareholders funds (i.e., retained profit or losses) on total assets.[4] *Tangibility* is measured as the ratio of tangible fixed assets to total assets. We further include the *growth potential* of the business start-ups in our sample by measuring the ratio of intangible fixed assets to total assets.

Next, we control for several other country-specific factors. To avoid having our fresh start measure capture differences in economic development rather than differences in the availability of a fresh start in a country's personal bankruptcy law, we control for the level of economic development of a country—measured by the natural logarithm of a country's *GDP per capita* (e.g., Djankov et al., 2007). The most important factor governing the ability of start-ups to raise debt financing might be the depth of the country's banking market (Kerr and Nanda, 2011). We measure a country's bank market development by the variable *private sector credit* which is measured as the domestic credit to the private sector in a country divided by the country's GDP (Djankov et al., 2007). Further, the availability of a fresh start in a country's personal bankruptcy

[3] Using country CPI data from the World Development Indicators.

[4] We do not measure profitability as the amount of earnings before interest and taxes (EBIT) to total assets because we otherwise lose data (i.e., those firms where we lack data in the profit and loss accounts). However, since the correlation between our measure of profitability and the ratio of EBIT to total assets is 0.855, the ratio of other shareholders funds to total assets is a good proxy for profitability. Moreover, results remain robust if we use the ratio of EBIT on total assets as measure of start-ups' profitability.

law may be less important if enforcement of these bankruptcy laws is weak. We therefore control for the *rule of law*, which measures the legal enforcement of laws (e.g., La Porta et al., 1998). It is a time-varying measure and varies between -2.5 (weak rule of law) and +2.5 (strong rule of law).[5,6] We also include *industry* and *year fixed effects* to account for unobservable macro-economic effects, general events, industry effects or trends in the data.

4.3 Determinants of start-ups' capital structure

4.3.1 Descriptive statistics

Table 4.1 presents cross-country summary statistics of leverage, other firm-specific and country-specific factors from the entire population of business start-ups founded in 26 countries between 2005 and 2012, as well as the country distribution of observations. Three countries represent an important fraction of the sample: the United Kingdom, France and Italy. Table 4.1 displays a wide-ranging pattern of leverage across countries. Start-ups in Austria have the lowest average leverage ratio, 0.3%, while start-ups in Germany have the highest average leverage ratio, 25.0%. Table 4.1 further provides evidence of heterogeneity in country-specific factors across countries. For instance, Russia scores lowest on the rule of law index while Finland scores highest on this index.

*** Include Table 4.1 about here ***

[5] We further estimated models that include country fixed effects to control for any remaining unmeasured or unobservable (static) differences between countries, including differences in financial reporting requirements and cultural differences.

[6] The regression results remain qualitatively similar when including the creditor rights index as a measure of creditor protection in a country (La Porta et al., 1998). However, the creditor rights index itself does not have a significant influence on start-ups' capital structure in the initial year of operation.

Table 4.2 presents summary statistics for the entire sample and correlations between the dependent, independent and control variables, except for industry and year dummies. Table 4.2 shows that the firms in our sample have an average leverage ratio of 11.9%. Start-ups are on average not profitable in the initial year of operation.

*** Include Table 4.2 about here ***

Table 4.3 presents the evolution of the availability of a fresh start in the personal bankruptcy laws of the 26 countries in our dataset over the 2005-2012 period. Table 4.3 illustrates that 14 countries had already implemented a fresh start policy before 2005 which also remained the case over the period 2005-2012 (Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Ireland, Luxembourg, Netherlands, Norway, Portugal, Sweden and the United Kingdom).[7] Six countries implemented a fresh start policy over the 2005-2012 period (Czech Republic in 2008, Greece in 2010, Italy in 2006, Latvia in 2008, Poland in 2009 and Slovakia in 2007), while six countries did not have a fresh start available in their personal bankruptcy laws over the entire 2005-2012 period (Bulgaria, Croatia, Hungary, Lithuania, Russian Federation and Spain).

*** Include Table 4.3 about here ***

4.3.2 Fresh start and start-ups' capital structure

Given the lack of research on start-ups' capital structure in a multi-country setting, we start by presenting first-time evidence on the determinants of start-ups' capital structure based on a multi-

[7] The fresh start variable for France in 2005 equals 0.5 in Cumming (2012) since the fresh start in France in 2005 was not unconditional but at the discretion of the court. However, we do not dispose of information on whether the fresh start in the different country-years in our sample is conditional or unconditional. Therefore, we do not make a distinction between conditional and unconditional fresh start and define the fresh start variable for France in 2005 as equal to 1.

country sample. We then examine the effect of a fresh start policy on start-ups' capital structure in more detail. Therefore, we estimate the following ordinary least squares (OLS) regressions:[8]

$$Y_{it} = \alpha + \beta_1 * X_{i,t} + \beta_2 * Z_{it} + \eta_i + \Theta_i + \nu_t + \varepsilon_{i,t} \quad (2)$$

where Z_{it} is a set of country-specific variables (i.e. fresh start) and all other variables are defined as in Eq. (1). Table 4.4 reports the estimated coefficients and standard errors clustered at the country level.[9]

*** Include Table 4.4 about here ***

4.3.2.1 Firm-specific factors

The top half of Table 4.4 reports the coefficient estimates of our firm-specific variables. The coefficient estimates in models (a) and (b) indicate that leverage is significantly and positively related to firm size and tangibility and significantly and negatively related to profitability. These findings are in line with the capital structure literature (Rajan and Zingales, 1995; Brav, 2009). These results are also generally consistent with the country-by-country leverage regressions that we report in appendix B. Firm size and tangibility are significantly and positively related to leverage in all country regressions while profitability is significantly and negatively related to leverage in all country regressions. Finally, growth potential is significantly and positively related to leverage in 16 out of 26 countries.

[8] Because the dependent variable is bounded above and below, we also used Tobit regressions as robustness check. Results remain qualitatively similar.

[9] It is important to note that clustering at the country level generates the most conservative standard errors; the standard errors become much smaller when we cluster them at the industry or year level or when we do not cluster at all.

4.3.2.2 Country-specific factors

The estimates of the country dummies in model (a) of Table 4.4 indicate that differences in firm characteristics cannot explain all leverage differences between countries for start-ups since 21 of the 25 country dummies are significant.[10] This illustrates that most countries have a different leverage ratio compared to the United Kingdom, which is our base case. In other words, this is evidence that some country characteristics are important determinants of start-ups' capital structure.

In model (b), we add three country-specific variables that are expected to have an influence on start-ups' leverage ratio. However, adding these three variables (GDP per capita, private sector credit and rule of law) only increases the adjusted R-squared from 21.8% in model (a) to 21.9% in model (b). Our findings in model (b) indicate that GDP per capita and private sector credit are positively and significantly related with start-ups' leverage ratio. This is consistent with the idea that start-ups get easier access to debt financing in countries that are economically better developed and where the banking market is better developed. Model (c) finally shows the results of Eq.(2) when using a fresh start dummy. This variable is not significantly related with leverage.

4.3.3 Implementation of a fresh start policy

The empirical identification of the fresh start effect presented in model (c) of Table 4.4 comes from the comparison of the leverage ratio of start-ups founded in country-years where a fresh start is available in a country's personal bankruptcy laws with the leverage ratio of start-ups founded in country-years where a fresh start is not available. One concern with this approach is that this does not provide evidence of a different leverage ratio in firms founded in countries that

[10] Coefficients of the country dummies are not reported due to space considerations but are available from the authors upon request.

experience a fresh start reform (treated firms) as compared to in firms founded in countries that do not experience such a reform (control firms). To shed more light on this issue, we now analyze the effect of a fresh start on start-ups' capital structure using a difference-in-differences setup. This setup compares the change in capital structure of the start-ups founded in countries where a fresh start policy was implemented over the 2005-2012 period with the change in capital structure of a similar group of start-ups founded in countries where no fresh start was available over the entire 2005-2012 period.[11] The baseline setup is the following:[12]

$$Y_{it} = \alpha + \beta_1 * \text{Treated}_{it} + \beta_2 * \text{Post}_{it} + \beta_3 * (\text{Treated}_{it} * \text{Post}_{it}) + \beta_4 * X_{i,t} + \beta_5 * Z_{it} + \eta_i + \Theta_i + \nu_t + \varepsilon_{i,t} \quad (3)$$

where $Treated_{it}$ is a dummy variable that equals one for all start-ups in countries that implement a fresh start policy over the 2005-2012 period (treatment group) and zero otherwise; $Post_{it}$ is for the firms from the treatment group a dummy indicator equal to one in the post-treatment period and zero otherwise. All other variables are defined as in Eq. (1).

Including the $Treated_{it}$ dummy controls for any permanent, time-invariant differences between the treated and the control group. The $Post_{it}$ dummy controls for trends that are common to both groups. The main coefficient of interest is the coefficient for the interaction variable (β_3) since it shows the actual impact of the implementation of a fresh start policy. By using a difference-in-differences approach, we control for unobserved (non-time-varying)

[11] Note that we focus on start-ups and consequently only consider start-ups' capital structure in their initial year of operation. In the difference-in-differences setup, we therefore compare the capital structure of start-ups founded before the implementation of a fresh start policy with the capital structure of start-ups founded after the implementation of a fresh start policy.

[12] The treatment dummy controls for pretreatment differences in the characteristics of treated and control firms. Note that the main effect of the treated dummy in models (b), (c) and (d) is absorbed by the country-fixed effects, which also control for any other unmeasured but stable country characteristics that influence start-ups' capital structure.

differences between the treatment group and the control group and for confounding time trends. The difference-in-differences approach therefore ensures that the estimates will not be biased by permanent differences between the treatment and the control group or by shared trends. The time-varying firm-specific and country-specific variables are added to assure that the estimates are not impacted by a contemporaneous shock to these characteristics. The inclusion of country fixed effects in models (b), (c) and (d) ensures that differences in start-ups' leverage ratio between countries are not incorrectly attributed to the (lack of) availability of a fresh start in a country's personal bankruptcy laws because of an omitted variables problem.

To conduct the difference-in-differences estimation, we match the start-ups in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) with their nearest neighbor in terms of firm size, profitability, tangibility, growth potential, industry and year in the subsample of observations where no fresh start was available in a country's personal bankruptcy laws over the entire 2005-2012 period (control group).[13] The matching is done with replacement, which means that each start-up from the control group can be used as a neighbor for multiple start-ups from the treatment group. This should improve the accuracy of the matching procedure (Smith and Todd, 2005).

*** Include Table 4.5 about here ***

Table 4.5 reports the estimated coefficients and standard errors clustered at the country level.[14] Model (a) reports the baseline result in a setup without country fixed effects. In this

13 Whereas matching characteristics such as firm size, profitability, tangibility and growth potential are different when comparing the start-ups in countries that implement a fresh start policy over the 2005-2012 period (treatment group) with the full sample of start-ups in countries where no fresh start was available over the entire 2005-2012 period, this does not hold when comparing the treated start-ups with the matched control group. Moreover, graphical analysis shows that the parallel trends assumption is not violated.

14 It is important to note that clustering at the country level generates the most conservative standard errors; the standard errors become much smaller when we cluster them at the industry or year level or when we do not cluster at all.

model, we regress start-ups' leverage ratio on a post-treatment dummy, a dummy equal to one for the start-ups in countries that implement a fresh start policy over the 2005-2012 period, and an interaction term between the post-treatment and the implementation dummy. The variable of interest is the interaction term, as it captures the actual impact of the implementation of a fresh start policy. The interaction term is negatively and significantly related to start-ups' leverage ratio in model (a). Specifically, the leverage ratio of start-ups founded after the implementation of a fresh start policy is found to be 3.3 percentage points lower compared with what one would expect without the implementation of a fresh start policy.

In model (b), we add country-fixed effects, which control for unobserved time-invariant country-specific factors that could impact start-ups' capital structure. The results in this model again show a negative and significant impact of the implementation of a fresh start policy on start-ups' leverage ratio.

Next, we add a group of firm-specific control variables to the difference-in-differences setup in model (c). This ensures that our results are not driven by potential shocks in one of the traditional time-varying capital structure determinants. The negative and significant coefficient of -0.033 on the interaction term in column (c) indicates that the average leverage ratio for start-ups founded after the implementation of a fresh start policy decreased significantly compared with what one would expect without the implementation of a fresh start policy. The leverage ratio of start-ups founded after the implementation of a fresh start policy is 3.3 percentage points lower compared with what one would expect without the implementation of a fresh start policy. Finally, model (d) indicates that the results of model (c) also hold when further controlling for observable changes over time of country-specific capital structure determinants.

To address the possibility that our identification of a fresh start effect is caused by unobserved changes over time (i.e., changes in entrepreneurship policies), we compare the

leverage ratio of start-ups founded in the year before (year t-1) the implementation of a fresh start policy (in year t) with the leverage ratio of start-ups founded in the year after (year t+1) the implementation of a fresh start policy in Table 4.6 using the difference-in-differences setup in specification (3). Our sample now only includes the start-ups founded in the countries where a fresh start policy was implemented between 2005 and 2012 in the year before (year t-1) and the year after (t+1) the implementation of a fresh start policy (year t) and their nearest neighbor in terms of firm size, profitability, tangibility, growth potential, industry and year from the subsample of observations where no fresh start was available over the entire 2005-2012 period (control group).[15]

*** Include Table 4.6 about here ***

Table 4.6 reports the estimated coefficients and standard errors clustered at the country level.[16] The variable of interest, the interaction term that captures the actual impact of the implementation of a fresh start policy, is negatively and significantly related to start-ups' leverage ratio in models (a)-(b). This indicates that the leverage ratio of start-ups founded after the implementation of a fresh start policy is significantly lower compared with what one would expect without the implementation of a fresh start policy. However, when we add a group of firm-specific control variables in model (c) and a group of country-specific control variables in

[15] Whereas matching characteristics such as firm size, profitability, tangibility and growth potential are different when comparing the start-ups in countries that implement a fresh start policy over the 2005-2012 period (treatment group) with the full sample of start-ups in countries where no fresh start was available over the entire 2005-2012 period, this does not hold when comparing the treated start-ups with the matched control group.

[16] It is important to note that clustering at the country level generates the most conservative standard errors; the standard errors become much smaller when we cluster them at the industry or year level or when we do not cluster at all.

model (d), the interaction term is still negatively related to start-ups' leverage ratio but the significance disappears.[17]

Our results so far suggest that start-ups founded after the implementation of a fresh start policy use less debt than start-ups founded before the implementation of a fresh start policy. A potential concern with our base specifications is that perhaps the treated dummy is generally negatively correlated with differences between the capital structure of start-ups founded in one year and the capital structure of start-ups founded in the year after that. This could potentially explain why we find a negative relation between the treated dummy and changes in leverage from the pre-fresh start policy implementation to the post-fresh start policy implementation years. If so, such a correlation should be a general feature of the data that should be apparent in other time periods.

To address this issue, we repeat our baseline tests of Table 4.6 for placebo (i.e., fictitious) fresh start policy implementations occurring in another year than the year of the real fresh start policy implementation. We do not expect to find any effect of the fictitious implementation of a fresh start policy on start-ups' capital structure for these placebo tests. The results are displayed in Table 4.7. The variable of interest, the interaction term that captures the fictitious impact of the implementation of a fresh start policy, is negatively but not significantly related to start-ups' leverage ratio in models (a)-(d).

*** Include Table 4.7 about here ***

[17] A forgiving bankruptcy law that offers a fresh start from pre-bankruptcy debt permits entrepreneurs to re-enter the economy quickly after a business failure (Ayotte, 2007; Georgakopoulos, 2002; Landier, 2004). As such, it may require time before a fresh start policy will exert an influence on start-ups' capital structure, which might explain the lack of significance found in models (c) and (d). This is also illustrated by the significant results found in models (c) and (d) of unreported tests when we use a longer time window (three years) around the implementation of a fresh start policy (in year t).

Finally, we address the concern that our findings in Tables 4.5, 4.6 and 4.7 might be driven by an adverse selection problem. Generous personal bankruptcy laws may increase the demand for credit by less skilled entrepreneurs. Specifically, less skilled entrepreneurs who would not have founded a firm without generous personal bankruptcy laws might do so after the implementation of a fresh start policy.[18] This might explain why firms have less access to debt financing if a fresh start is available in a country's personal bankruptcy laws. To rule out this alternative explanation, we collect financial statement information for the population of firms founded in 2005 for up to seven years after founding.[19] This enables us to examine the capital structure of the same group of firms before and after the implementation of a fresh start policy. For this purpose, we subsequently use a similar difference-in-differences approach as in Table 5.[20,21] The panel structure of this dataset allows us to include firm fixed effects that control for time-invariant differences among entrepreneurs and firms and ensures that our identification of the fresh start effect comes entirely from (changes in) the possibility of filing for personal bankruptcy. Specifically, we use the following equation:

$$Y_{it} = \alpha + \beta_1 * \text{Treated}_{it} + \beta_2 * \text{Post}_{it} + \beta_3 * (\text{Treated}_{it} * \text{Post}_{it}) + \beta_4 * X_{i,t} + \beta_5 * Z_{it} + \eta_i + \Theta_i + \nu_t + \delta_i + \varepsilon_{i,t} \quad (4)$$

where δ_i *represents* the firm fixed effect in the equation and all other variables are defined as in Eq. (1).

[18] Although this might be an explanation, there is recent evidence that suggests that lenient bankruptcy laws encourage more capable entrepreneurs to found firms (Eberhart et al., 2017).
[19] We only select firm-year observations for which all information needed to calculate our variables is available. Start-ups with missing data for one or more years are removed from the dataset.
[20] We also constructed a similar panel dataset for the firms founded in 2006. Results remain qualitatively similar.
[21] Note that the matching occurs based on the initial year of operation.

*** Include Table 4.8 about here ***

Table 4.8 reports the estimated coefficients and standard errors clustered at the firm level.[22] Models (a), (b), (c) and (d) of Table 4.8 indicate that the implementation of a fresh start policy has a statistically significant negative impact on start-ups' leverage ratio. For instance in model (d), the leverage ratio of start-ups founded after the implementation of a fresh start policy is found to be 8.2 percentage points lower compared with what one would expect without the implementation of a fresh start policy. These findings are in line with the findings in Table 4.4, 4.5 and 4.6 and indicate that our results are not driven by an adverse selection problem.

In sum, the results in this section suggest that a fresh start policy can explain significant differences across countries in how start-ups' capital structure is determined. Indeed, the implementation of a fresh start policy has a significant and economically large impact on start-ups' capital structure. Specifically, start-ups have less access to debt financing when a fresh start is possible for bankrupt entrepreneurs. These findings are in line with the view that financiers will tend to provide less debt when a fresh start is possible for bankrupt entrepreneurs.

4.3.4 Additional robustness tests

We test the robustness of our results in sections 4.3.2-4.3.3 by conducting several additional analyses. First, we examine whether our results are driven by particular countries in the dataset. Second, we investigate whether very small firms in our sample drive our results. Third, we test whether our results hold when using different matching techniques. Finally, we investigate the effect of other personal bankruptcy law measures as in Armour and Cumming (2006 and 2008)

[22] We also perform the regression analyses by clustering both at the firm and at the country level. The regression results remain qualitatively similar.

on start-ups' capital structure in their initial year of operation. Detailed results of these tests are not presented due to space considerations but are available from the authors upon request.

First, as is observed in our European dataset, the number of start-ups from the UK, France and Italy dwarf the number of start-ups of any other European country. Therefore, it is important to make sure that our results are not driven by these countries with many start-ups. However, no differences emerge when excluding these three most represented countries. We also conduct a weighted least squares (WLS) regression where the weight is the inverse of the number of firms in a firm's country. Again, results remain qualitatively similar. Relatedly, by dropping each country from the analyses, we check to see if any country disproportionately influences our results. However, no striking differences emerge when leaving out specific countries.

Second, we investigate whether our results are potentially driven by very small firms that may have limited operational activities but dominate the population of start-ups (and our sample). We therefore focus on different subsamples of firms that differ in size using quartiles of our firm size variable. The signs of coefficients and their significance remain qualitatively similar if we run the regressions for these different subsamples.

Third, we examine whether our results hold when using alternative matching techniques. First, it might be that the results of our difference-in-differences setup are driven by start-ups founded in a country where a fresh start policy was implemented between 2005 and 2012 (treated group) that are matched with start-ups founded in another country that is not comparable with the country where a fresh start was implemented. We therefore now use the same characteristics as in the previous section in our matching approach but we match start-ups founded in a country where a fresh start policy was implemented between 2005 and 2012 (treated group) with start-ups founded in a comparable country where no fresh start was available over the entire 2005-2012 period (control group). For instance, start-ups founded in Greece and Italy are matched with start-

ups founded in Spain; start-ups founded in Latvia are matched with start-ups founded in Lithuania. Results remain qualitatively similar. Second, we match the start-ups in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) with their nearest neighbor in terms of firm size, profitability, tangibility, growth potential and industry in the subsample of observations where a fresh start for bankrupt entrepreneurs was possible over the entire 2005-2012 period (control group). The regression results remain qualitatively similar to the ones reported in Table 4.5 and 4.6.

Finally, we consider different personal bankruptcy law measures as in Armour and Cumming (2006 and 2008). However, these other variables are not significantly related to start-ups' leverage ratio in their initial year of operation.[23] This suggests that the availability of a fresh start in a country's personal bankruptcy laws is the most important aspect of a country's personal bankruptcy laws.

4.4 Conclusion

This study examines cross-country differences in start-ups' capital structure depending on the availability of a fresh start in a country's personal bankruptcy laws. Towards this end, we use a novel dataset that extends the coverage of both countries and firms relative to existing research on start-up financing, which covers the universe of business start-ups founded in 26 European countries between 2005 and 2012.

We find that a fresh start policy is an important determinant of start-ups' capital structure. Using a difference-in-differences setup, we find that start-ups founded after the implementation of a fresh start policy use less debt as compared with what one would expect without the

[23] Note that we only have information of these measures for the year 2005 for the countries that were included in the dataset used by Cumming (2012).

implementation of a fresh start policy. These effects are all economically large as well as statistically significant. Overall, these findings underscore the need for more research on the capital structure of start-ups and entrepreneurial firms more broadly that goes beyond the traditional firm-level capital structure determinants.

Our results have important policy implications. Forgiving personal bankruptcy laws that provide bankrupt entrepreneurs with a second chance have the purpose of enhancing entrepreneurial activity. However, our results indicate that a fresh start policy also has counter effects. Specifically, we show that personal bankruptcy laws that provide a fresh start for bankrupt entrepreneurs can make it more difficult for entrepreneurs to get access to debt financing. Since access to capital is an important determinant of start-up growth and survival (Evans and Jovanovic, 1989; Holtz-Eakin, Joulfaian, and Rosen, 1994), an intriguing question for future research is what total economic impact a fresh start policy has.

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Tables

Table 4.1: Cross-country summary statistics of leverage and other firm-level and country-level characteristics
The sample consists of 2,849,997 business start-ups from 26 European countries that were founded between 2005 and 2012. The table presents the mean, median (in brackets) and standard deviation (S.D.) of leverage, other firm-specific and country-specific characteristics. Variable definitions are provided in appendix A.

Country	Leverage		Firm size		Profitability		Tangibility		Growth potential		GDP per capita		Private sector credit		Rule of law		N
	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	Mean [Median]	SD	
Austria	0.003 [0.000]	0.045	4.769 [4.692]	1.466	-0.217 [-0.049]	0.584	0.202 [0.046]	0.280	0.036 [0.000]	0.105	10.745 [10.772]	0.096	1.161 [1.171]	0.046	1.865 [1.840]	0.059	36,329
Belgium	0.176 [0.000]	0.253	4.388 [4.318]	1.329	-0.031 [0.018]	0.407	0.272 [0.021]	0.274	0.059 [0.000]	0.129	10.688 [10.708]	0.087	0.876 [0.922]	0.083	1.328 [1.330]	0.068	39,554
Bulgaria	0.022 [0.000]	0.118	2.165 [1.751]	1.591	0.120 [0.068]	0.525	0.144 [0.000]	0.268	0.005 [0.000]	0.040	8.910 [8.900]	0.075	0.632 [0.637]	0.032	-0.127 [-0.120]	0.013	41,293
Croatia	0.105 [0.000]	0.239	3.145 [2.903]	1.640	-0.119 [0.000]	0.467	0.204 [0.042]	0.279	0.013 [0.000]	0.060	9.492 [9.511]	0.095	0.647 [0.678]	0.063	0.126 [0.140]	0.070	10,223
Czech Republic	0.114 [0.000]	0.244	3.595 [3.335]	1.520	-0.086 [-0.001]	0.414	0.166 [0.000]	0.278	0.008 [0.000]	0.049	9.866 [9.888]	0.148	0.451 [0.480]	0.054	0.924 [0.930]	0.064	23,131
Denmark	0.047 [0.000]	0.157	4.856 [4.875]	1.508	0.088 [0.061]	0.479	0.170 [0.000]	0.277	0.045 [0.000]	0.113	10.919 [10.962]	0.078	1.922 [2.083]	0.197	1.929 [1.930]	0.040	29,220
Estonia	0.157 [0.000]	0.281	2.684 [2.369]	1.413	0.122 [0.088]	0.465	0.192 [0.000]	0.280	0.005 [0.000]	0.042	9.595 [9.716]	0.194	0.811 [0.809]	0.137	1.093 [1.120]	0.078	23,622
Finland	0.176 [0.000]	0.292	3.727 [3.701]	1.618	-0.023 [0.018]	0.528	0.216 [0.056]	0.281	0.030 [0.000]	0.095	10.770 [10.767]	0.087	0.876 [0.928]	0.087	1.944 [1.960]	0.031	28,821
France	0.241 [0.072]	0.290	4.282 [4.251]	1.413	-0.009 [0.015]	0.396	0.170 [0.070]	0.222	0.092 [0.000]	0.159	10.626 [10.636]	0.081	1.058 [1.068]	0.081	1.449 [1.440]	0.031	393,092
Germany	0.250 [0.016]	0.324	4.168 [3.909]	1.645	-0.047 [0.000]	0.354	0.167 [0.008]	0.264	0.016 [0.000]	0.066	10.615 [10.640]	0.098	1.081 [1.074]	0.032	1.696 [1.720]	0.054	159,316
Greece	0.108 [0.000]	0.204	5.616 [5.914]	1.361	-0.030 [0.002]	0.320	0.207 [0.077]	0.260	0.026 [0.001]	0.072	10.163 [10.161]	0.124	0.952 [0.940]	0.188	0.707 [0.780]	0.157	1,297
Hungary	0.006 [0.000]	0.064	2.470 [2.175]	1.615	-0.232 [-0.023]	0.593	0.149 [0.000]	0.258	0.007 [0.000]	0.046	9.480 [9.469]	0.105	0.609 [0.653]	0.072	0.778 [0.760]	0.096	172,844
Ireland	0.202 [0.000]	0.313	3.071 [3.160]	2.227	-0.110 [0.000]	0.574	0.155 [0.000]	0.258	0.014 [0.000]	0.073	10.889 [10.875]	0.086	1.873 [1.831]	0.279	1.712 [1.710]	0.056	23,539
Italy	0.089 [0.000]	0.201	4.394 [4.493]	1.613	-0.158 [-0.006]	0.497	0.136 [0.018]	0.220	0.101 [0.032]	0.137	10.516 [10.519]	0.063	1.086 [1.096]	0.124	0.399 [0.420]	0.037	364,174
Latvia	0.192 [0.000]	0.312	2.030 [1.603]	1.568	-0.202 [-0.005]	0.660	0.142 [0.000]	0.247	0.005 [0.000]	0.039	9.475 [9.531]	0.113	0.824 [0.832]	0.044	0.757 [0.760]	0.027	24,184
Lithuania	0.032	0.134	3.739	1.656	-0.050	0.426	0.164	0.247	0.009	0.043	9.327	0.223	0.497	0.098	0.691	0.070	3,617

Luxembourg	0.088	0.222	4.656	1.455	-0.134	0.418	0.162	0.244	0.036	0.090	11.494	0.124	1.598	0.297	1.777	0.052	1,449
	[0.000]		[4.453]		[-0.018]		[0.025]		[0.000]		[11.545]		[1.620]		[1.800]		
Netherlands	0.067	0.199	4.589	1.371	0.068	0.481	0.097	0.213	0.027	0.095	10.855	0.079	1.936	0.152	1.784	0.030	122,486
	[0.000]		[4.560]		[0.033]		[0.000]		[0.000]		[10.857]		[1.992]		[1.800]		
Norway	0.108	0.239	4.439	1.540	-0.030	0.415	0.182	0.286	0.022	0.077	11.376	0.139	0.793	0.014	1.929	0.027	96,412
	[0.000]		[4.421]		[0.000]		[0.000]		[0.000]		[11.381]		[0.797]		[1.920]		
Poland	0.088	0.220	3.902	1.905	-0.157	0.555	0.130	0.242	0.018	0.074	9.417	0.134	0.407	0.047	0.583	0.147	14,550
	[0.000]		[3.835]		[-0.006]		[0.000]		[0.000]		[9.484]		[0.432]		[0.600]		
Portugal	0.138	0.263	3.412	1.435	-0.192	0.507	0.220	0.269	0.022	0.071	10.002	0.086	1.646	0.199	1.033	0.067	160,497
	[0.000]		[3.378]		[-0.031]		[0.082]		[0.000]		[10.034]		[1.744]		[1.030]		
Russian Federation	0.143	0.277	2.658	2.190	-0.028	0.349	0.059	0.184	0.002	0.023	9.417	0.203	0.409	0.045	-0.808	0.056	256,084
	[0.000]		[2.307]		[0.000]		[0.000]		[0.000]		[9.497]		[0.404]		[-0.820]		
Slovakia	0.033	0.136	3.130	1.517	-0.112	0.464	0.164	0.273	0.004	0.032	9.736	0.095	0.474	0.027	0.520	0.047	13,794
	[0.000]		[2.765]		[-0.002]		[0.000]		[0.000]		[9.753]		[0.483]		[0.530]		
Spain	0.151	0.268	4.244	1.579	-0.107	0.406	0.204	0.271	0.037	0.099	10.313	0.093	1.752	0.310	1.121	0.040	203,445
	[0.000]		[4.299]		[-0.004]		[0.052]		[0.000]		[10.333]		[1.710]		[1.130]		
Sweden	0.127	0.250	3.977	1.320	0.109	0.343	0.125	0.239	0.018	0.078	10.897	0.100	1.143	0.063	1.920	0.049	33,900
	[0.000]		[3.923]		[0.036]		[0.000]		[0.000]		[10.929]		[1.175]		[1.930]		
United Kingdom	0.046	0.171	2.705	1.899	0.006	0.506	0.116	0.222	0.026	0.097	10.642	0.081	1.730	0.179	1.684	0.061	573,124
	[0.000]		[2.754]		[0.003]		[0.000]		[0.000]		[10.628]		[1.682]		[1.680]		

Table 4.2: Descriptive statistics

The sample consists of 2,849,997 business start-ups from 26 European countries that were founded between 2005 and 2012. The table presents variable definitions, the mean, standard deviation (S.D.), minimum, maximum and correlations of firm-specific and country-specific characteristics. All correlations with an absolute value equal or higher than 0.010 are statistically significant at the 5% significance level. Variable definitions are provided in appendix A.

Variables	Mean	Median	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Firm-level													
(1) Leverage	0.119	0.000	0.246	0.000	0.813	1.000							
(2) Firm size	3.598	3.649	1.875	0.198	6.986	0.253	1.000						
(3) Profitability	-0.060	0.000	0.474	-1.648	0.660	-0.092	0.278	1.000					
(4) Tangibility	0.147	0.002	0.242	0.000	0.816	0.245	0.236	-0.026	1.000				
(5) Growth potential	0.041	0.000	0.109	0.000	0.431	0.137	0.135	-0.089	-0.032	1.000			
Panel B: Country-level													
(6) GDP per capita	10.361	10.553	0.541	8.257	11.637	0.039	0.240	0.060	0.039	0.135	1.000		
(7) Private sector credit	1.214	1.130	0.503	0.225	2.275	-0.072	0.018	0.034	0.024	0.009	0.538	1.000	
(8) Rule of law	1.087	1.430	0.782	-0.950	2.000	0.010	0.118	0.058	0.078	0.019	0.763	0.619	1.000
(9) Fresh start	0.733	1.000	0.442	0.000	1.000	0.022	0.121	0.036	0.030	0.122	0.711	0.417	0.609

Table 4.3: Fresh start in Europe (2005-2012)
The sample consists of 2,849,997 business start-ups from 26 European countries that were founded between 2005 and 2012. Variable definitions are provided in appendix A. Country FE are country fixed effects. Industry FE are industry fixed effects. Year FE are year fixed effects.

Country	2005	2006	2007	2008	2009	2010	2011	2012
AUSTRIA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BELGIUM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BULGARIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CROATIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CZECH REPUBLIC	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
DENMARK	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ESTONIA	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FINLAND	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FRANCE	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GERMANY	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
GREECE	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
HUNGARY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IRELAND	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
ITALY	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
LATVIA	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
LITHUANIA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LUXEMBOURG	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NETHERLANDS	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
NORWAY	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
POLAND	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00
PORTUGAL	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
RUSSIAN FEDERATION	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SLOVAKIA	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
SPAIN	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SWEDEN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
UNITED KINGDOM	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 4.4: The determinants of start-ups' capital structure
The sample consists of 2,849,997 business start-ups from 26 European countries that were founded between 2005 and 2012. Coefficients in all specifications are estimated using OLS. Standard errors are reported in parentheses and are computed robust to both clustering at the country level and heteroskedasticity. Variable definitions are provided in appendix A. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	Leverage		
	(a)	(b)	(c)
Firm-specific factors			
Firm size	0.031***	0.031***	0.030***
	(0.006)	(0.006)	(0.006)
Profitability	-0.082***	-0.082***	-0.070***
	(0.015)	(0.015)	(0.015)
Tangibility	0.175***	0.175***	0.178***
	(0.039)	(0.039)	(0.036)
Growth potential	0.205*	0.205*	0.198
	(0.116)	(0.116)	(0.145)
Country-specific factors			
GDP per capita		0.089***	-0.010
		(0.011)	(0.049)
Private sector credit		0.033*	-0.045
		(0.018)	(0.037)
Rule of law		-0.046	0.012
		(0.042)	(0.054)
Fresh start			0.014
			(0.041)
Country FE	Yes	Yes	No
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R^2	0.218	0.219	0.147
Observations	2,849,997	2,849,997	2,849,997

Table 4.5: The effect of a fresh start on start-ups' capital structure
The sample consists of the start-ups founded in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) and their nearest neighbor in terms of firm size, profitability, tangibility, growth potential and industry from the subsample of observations where no fresh start was possible over the entire 2005-2012 period (control group). Coefficients in all specifications are estimated using OLS. Standard errors are reported in parentheses and are computed robust to both clustering at the country level and heteroskedasticity. Variable definitions are provided in appendix A. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	Leverage			
	(a)	(b)	(c)	(d)
Treated * Post	-0.033**	-0.034***	-0.033***	-0.040*
	(0.016)	(0.011)	(0.010)	(0.022)
Post	0.047*	0.075***	0.085***	0.086**
	(0.025)	(0.028)	(0.028)	(0.035)
Treated	-0.029			
	(0.039)			
Firm-specific factors				
Firm size			0.032***	0.032***
			(0.008)	(0.008)
Profitability			-0.068***	-0.069***
			(0.018)	(0.018)
Tangibility			0.129***	0.130***
			(0.032)	(0.032)
Growth potential			0.058	0.056
			(0.072)	(0.072)
Country-specific factors				
GDP per capita				0.032
				(0.041)
Private sector credit				-0.039
				(0.049)
Rule of law				-0.013
				(0.065)
Country FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.039	0.079	0.137	0.137
Observations	653,535	653,535	653,535	653,535

Table 4.6: The effect of a fresh start on start-ups' capital structure: capital structure dynamics around the fresh start implementation

The sample consists of the start-ups founded in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) in the year before (year t-1) and the year after (t+1) the implementation of a fresh start policy (year t) and their nearest neighbor in terms of firm size, profitability, tangibility, growth potential and industry from the subsample of observations where no fresh start was possible over the entire 2005-2012 period (control group). Coefficients in all specifications are estimated using OLS. Standard errors are reported in parentheses and are computed robust to both clustering at the country level and heteroskedasticity. Variable definitions are provided in appendix A. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	Leverage			
	(a)	(b)	(c)	(d)
Treated * Post	-0.065***	-0.091*	-0.068	-0.044
	(0.013)	(0.052)	(0.050)	(0.047)
Post	0.071*	0.135*	0.150*	0.123
	(0.036)	(0.080)	(0.082)	(0.083)
Treated	0.013			
	(0.042)			
Firm-specific factors				
Firm size			0.043***	0.043***
			(0.008)	(0.008)
Profitability			-0.067***	-0.068***
			(0.009)	(0.009)
Tangibility			0.118***	0.118***
			(0.033)	(0.033)
Growth potential			0.105	0.103
			(0.102)	(0.102)
Country-specific factors				
GDP per capita				-0.072
				(0.055)
Private sector credit				0.041
				(0.050)
Rule of law				-0.159
				(0.170)
Country FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.034	0.066	0.139	0.140
Observations	164,105	164,105	164,105	164,105

Table 4.7: The effect of a fresh start on start-ups' capital structure: capital structure dynamics around a placebo fresh start implementation

The sample consists of the start-ups founded in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) in the year before (year t-1) and the year after (t+1) the implementation of a fresh start policy (year t) and their nearest neighbor in terms of firm size, profitability, tangibility, growth potential and industry from the subsample of observations where no fresh start was possible over the entire 2005-2012 period (control group). Coefficients in all specifications are estimated using OLS. Standard errors are reported in parentheses and are computed robust to both clustering at the country level and heteroskedasticity. Variable definitions are provided in appendix A. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	Leverage			
	(a)	(b)	(c)	(d)
Treated * Post	0.017	0.013	0.008	-0.001
	(0.054)	(0.013)	(0.015)	(0.016)
Post	0.123**	0.153***	0.167***	0.205***
	(0.049)	(0.043)	(0.048)	(0.053)
Treated	-0.094			
	(0.066)			
Firm-specific factors				
Firm size			0.026***	0.026***
			(0.009)	(0.009)
Profitability			-0.054***	-0.055***
			(0.015)	(0.015)
Tangibility			0.141***	0.140***
			(0.036)	(0.036)
Growth potential			0.088	0.087
			(0.085)	(0.085)
Country-specific factors				
GDP per capita				0.199***
				(0.034)
Private sector credit				0.087
				(0.064)
Rule of law				-0.195***
				(0.038)
Country FE	No	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.067	0.109	0.154	0.156
Observations	198,848	198,848	198,848	198,848

Table 4.8: The effect of a fresh start on start-ups' capital structure: adverse selection
The sample consists of the start-ups founded in 2005 in the countries where a fresh start policy was implemented between 2005 and 2012 (treated group) and their nearest neighbor in terms of firm size, profitability, tangibility, growth potential and industry from the subsample of firms founded in 2005 in countries where no fresh start was possible over the entire 2005-2012 period (control group). Coefficients in all specifications are estimated using OLS. Standard errors are reported in parentheses and are computed robust to both clustering at the firm level and heteroskedasticity. Variable definitions are provided in appendix A. ***, **, and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Dependent variable	Leverage			
	(a)	(b)	(c)	(d)
Treated * Post	-0.084***	-0.096***	-0.076***	-0.082***
	(0.004)	(0.004)	(0.004)	(0.006)
Post	0.133***	0.142***	0.154***	0.159***
	(0.003)	(0.003)	(0.004)	(0.004)
Treated	-0.007**			
	(0.003)			
Firm-specific factors				
Firm size			0.052***	0.053***
			(0.002)	(0.002)
Profitability			-0.210***	-0.210***
			(0.005)	(0.005)
Tangibility			0.134***	0.133***
			(0.008)	(0.008)
Growth potential			0.156***	0.171***
			(0.023)	(0.023)
Country-specific factors				
GDP per capita				-0.250***
				(0.015)
Private sector credit				-0.040***
				(0.013)
Rule of law				0.201***
				(0.018)
Firm FE	No	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.030	0.574	0.605	0.607
Observations	146,196	146,196	146,196	146,196

Appendix A. Variable definitions

Variable	Definition
Leverage	Total bank debt/total assets.
Firm size	Ln(total assets + 1).
Profitability	Other shareholders funds/total assets.
Tangibility	Net PPE/total assets.
Growth potential	Intangible fixed assets/total assets.
Fresh start	A dummy variable which equals one if a fresh start is available in a country's personal bankruptcy law and zero otherwise. Source: European Commission and International Insolvency Institute.
GDP per capita	Ln(GDP per capita in current US $). Source: World Development Indicators, World Bank.
Private sector credit	Domestic credit to the private sector in a country divided by a country's GDP. Measures a country's bank market development. Source: Financial Development Data, World Bank.
Rule of law	An index that reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, and the courts, as well as the likelihood of crime and violence. The index ranges from -2.5 (weak governance performance) to +2.5 (strong governance performance). Source: Worldwide Governance Index.

Appendix B. Firm-level regressions of capital structure

In appendix B, we report individual country regressions that estimate the influence of firm-level explanatory variables on business start-ups' capital structure in the initial year of operation. The firm-level variables that we include are firm size, profitability, tangibility and growth potential. In addition, we include industry (based on 2-digit SIC codes) and year indicator variables in all the regressions.

Pooled firm-level regressions of leverage by country

Country	Firm size	Profitability	Tangibility	Growth potential	Observations	Adjusted R^2
Austria	0.003***	-0.004***	0.003**	-0.004	36,329	0.008
	(0.000)	(0.001)	(0.001)	(0.003)		
Belgium	0.060***	-0.093***	0.394***	0.196***	39,554	0.349
	(0.001)	(0.003)	(0.005)	(0.010)		
Bulgaria	0.014***	-0.016***	0.036***	-0.023*	41,293	0.056
	(0.001)	(0.001)	(0.003)	(0.012)		
Croatia	0.042***	-0.059***	0.185***	0.085**	10,223	0.244
	(0.002)	(0.004)	(0.010)	(0.038)		
Czech Republic	0.032***	-0.110***	0.169***	0.032	23,131	0.146
	(0.001)	(0.005)	(0.008)	(0.035)		
Denmark	0.015***	-0.033***	0.204***	0.030***	29,220	0.309
	(0.001)	(0.002)	(0.005)	(0.007)		
Estonia	0.091***	-0.238***	0.210***	0.259***	23,622	0.375
	(0.001)	(0.005)	(0.007)	(0.042)		
Finland	0.056***	-0.161***	0.241***	0.282***	28,821	0.260
	(0.001)	(0.004)	(0.007)	(0.020)		
France	0.040***	-0.140***	0.396***	0.473***	393,092	0.326
	(0.000)	(0.001)	(0.002)	(0.003)		
Germany	0.056***	-0.157***	0.267***	0.323***	159,316	0.233
	(0.001)	(0.003)	(0.004)	(0.013)		
Greece	0.046***	-0.059***	0.112***	0.114	1,297	0.180
	(0.005)	(0.016)	(0.029)	(0.082)		
Hungary	0.005***	-0.006***	0.006***	0.006	172,844	0.017
	(0.000)	(0.000)	(0.001)	(0.004)		
Ireland	0.041***	-0.181***	0.202***	0.218***	23,539	0.226
	(0.001)	(0.004)	(0.009)	(0.031)		
Italy	0.040***	-0.050***	0.087***	0.060***	364,174	0.125
	(0.000)	(0.001)	(0.002)	(0.003)		
Latvia	0.042***	-0.193***	0.259***	0.372***	24,184	0.253
	(0.001)	(0.003)	(0.009)	(0.054)		
Lithuania	0.013***	-0.021***	0.050***	-0.064	3,617	0.077
	(0.002)	(0.005)	(0.013)	(0.040)		
Luxembourg	0.038***	-0.064***	0.253***	0.110	1,449	0.151
	(0.005)	(0.015)	(0.033)	(0.070)		
Netherlands	0.030***	-0.079***	0.180***	0.269***	122,486	0.162
	(0.000)	(0.001)	(0.004)	(0.008)		
Norway	0.038***	-0.083***	0.302***	0.074***	96,412	0.289
	(0.000)	(0.002)	(0.004)	(0.010)		
Poland	0.023***	-0.087***	0.150***	-0.031	14,550	0.097
	(0.001)	(0.004)	(0.010)	(0.023)		
Portugal	0.051***	-0.118***	0.149***	0.187***	160,497	0.128

	(0.001)	(0.002)	(0.003)	(0.011)		
Russian Federation	0.018***	-0.224***	0.149***	0.140***	256,084	0.120
	(0.000)	(0.002)	(0.003)	(0.025)		
Slovakia	0.016***	-0.042***	0.059***	-0.016	13,794	0.067
	(0.001)	(0.004)	(0.006)	(0.033)		
Spain	0.053***	-0.087***	0.190***	0.362***	203,445	0.191
	(0.000)	(0.001)	(0.003)	(0.006)		
Sweden	0.055***	-0.207***	0.367***	0.369***	33,900	0.399
	(0.001)	(0.005)	(0.008)	(0.020)		
United Kingdom	0.019***	-0.062***	0.057***	0.003	573,124	0.113
	(0.000)	(0.001)	(0.002)	(0.003)		

Chapter 5: Conclusions, avenues for future research and implications

The goal of this dissertation was to improve our understanding of the financing of new firms. In the first study, I extend the entrepreneurial finance literature by studying the evolution of a broad range of debt policies from start-up. The second study focuses on the evolution of slack levels in new firms. In the last study, I analyze cross-country differences in the capital structure of new firms depending on countries' fresh start policy.

As such, my three studies have yielded novel insights and have contributed in several ways to the existing literature and to theory. The next section provides an overview of the overall contributions of this dissertation, without reviewing the individual contributions of the three studies. Furthermore, I also identify some limitations as well as avenues for future research and I end with some implications for practice.

5.1 General conclusions and contributions

First, this dissertation advances our understanding of *new firms' financial decision-making*. Scholars examining new firms' financial policies have largely relied on cross-sectional data sets and on data sets of limited geographic focus (Cassar, 2004; Cumming, 2005; Robb and Robinson, 2014). As more detailed information is typically available about listed firms and established private firms, researchers investigating the dynamics of and cross-country differences in firms' financing decisions have largely focused on these type of firms (e.g., Djankov et al., 2003, 2007, 2008; Hanousek and Shamshur, 2011; Lemmon et al., 2008). However, given that new firms are an important growth factor of our economy and are important for job creation and innovation, examining financial decision-making in new firms from start-up deserves significant more attention. The main goal of this dissertation was thus

to improve our knowledge of new firms' financial decision-making from start-up. Firms' financial policies at founding are found to serve as strong predictors of firms' future financial policies. As the studies in this dissertation have shown, firm-specific and country-specific factors drive firms' financial policies at start-up (and beyond). I will highlight some of these factors below. Nevertheless, this dissertation shows that time-invariant factors play an important role in explaining firms' financial policies and more research on financial decision making in very early stage firms is warranted.

Second, I found that new firms' *founder-CEOs are an important factor behind the stable component of firms' financial policies.* The results of study 1 and 2 show that the stable component of new firms' financial policies diminishes after the replacement (and death) of firm's founder-CEO. Overall, this dissertation has substantially increased our understanding of the impact of firm's founder-CEO on firms' financial decision-making.

Third, this dissertation also illustrates that *firm-specific factors alone cannot explain the heterogeneity in new firms' financial policies across countries. Countries' fresh start policy* in particular *is* found to be *an important determinant of new firms' capital structure*. Study 3 suggests that firm's capital structure may also be influenced by their environment. Hence, next to firm's founder-CEO, firm's environment may also imprint firm's capital structure.

5.2 Other theoretical contributions

The contributions of this dissertation to current theory are multiple. As the previous section largely focuses on the contributions to the current entrepreneurial finance literature, this section provides an overview of the implications to some theories.

First, this dissertation *contributes to dynamic trade-off theories*. Specifically, existing theory assumes that firms will rebalance their financial structure when it deviates too much from its target. However, the observed stability of financial policies might be driven in large

part by low speeds of adjustment to moving target financial policies. The findings of this dissertation contribute to this theory by showing that target financial policies also contain an important stable component. The question therefore is whether the stable component in firms' financial policies is caused by target financial policies that are consciously set at founding and subsequently become institutionalized or the result of financial policies that are unconsciously created at founding and become the "rule" due to institutionalization.

Second, this dissertation *contributes to imprinting theory*. I enrich the body of this theory by providing new evidence that founder-CEOs act as imprinters of new firms' financial policies *independently* from macrolevel collectives. Existing theory assumes that not all imprints will evolve in the same way and the results in this dissertation are consistent with this view. From the current theory, it could be argued that different slack levels across firms are one potential reason why imprinting influences may differ across firms even when they operate under the same temporal and special conditions (Simsek et al., 2015). This dissertation extends imprinting theory by revealing that slack levels themselves get imprinted.

Finally, this dissertation also *contributes to behavioral theory*. Behavioral scholars generally argue that slack resources are a dynamic "rest" category that functions as a shock absorber (March, 1979). I track the evolution of new firms' slack levels for up to 15 years after founding to provide a richer theoretical argument on the evolution of slack levels in firms. My results indicate that an important distinction has to be made between the stable and dynamic component in slack levels. Therefore, future studies need to puzzle out the distinctive antecedents and consequences of both components. This dissertation points out that behavioral factors might lead to the stable component in slack levels. Though future work in this direction is recommended.

5.3 Limitations and avenues for future research

The studies in this dissertation provide interesting findings and novel insights, but are not without limitations that also suggest opportunities for future research. First, empirical tractability pushed us to focus on a sample of new legally incorporated firms. Although the legal foundation of a firm is a milestone in its life-cycle, a firm may already exist a couple of years as a business before being founded as a legal entity. Of particular interest for future research is thus the question of how the step from business to legal entity affects new firms' financial policies. Relatedly, the results in study 1 and 2 indicate that the replacement of the founder-CEO represents the beginning of a new sensitive period—a period of turmoil which can have a fundamental influence on firms' characteristics—where firms may break out of the inertial path created by an imprint of firm's founder-CEO. However, next to the foundation of a firm and the replacement of firm's founder-CEO, there are other potential sensitive periods in a firm's life cycle. Another fruitful avenue for future research would therefore be to explore the impact of other periods of high susceptibility in a firm's life cycle. This may allow us to answer the question when the stability of firms' financial policies diminishes. Marquis and Tilcsik (2013), for instance, suggest that merging with another firm is likely to provoke changes to a firm's characteristics.

Second, due to data availability, the inclusion of a founder-CEO dummy (or fixed effect) in study 1 and 2 is our only proxy for salient founder-CEO characteristics (e.g., psychological risk-taking characteristics and entrepreneurial overconfidence) that impact firms' financial policies. Despite capturing the presence/absence of a firm's founder-CEO offers advantages of comprehensibility and testability (Anderson and Reeb, 2003; Fahlenbrach, 2009), the collection of finer-grained data may result in greater clarity of how founder-CEOs determine new firms' financial policies. Using the variance partioning methodology, it would then also

be possible to estimate precisely the relative importance of different founder-CEO characteristics in explaining new firms' financial policies.

Next, in study 1 and 2 the focus was on the evolution of new firms' debt and slack policies in Belgium while study 3 only focuses on cross-country differences in new firms' leverage ratios in their initial year of operation due to data availability in the Amadeus database. Although the focus on Belgian firms in study 1 and 2 has the beneficial effect of removing unobserved heterogeneity among firms resulting from variance in country-specific conditions, future research would be well served to explore the effect of different institutional contexts on the evolution of new firms' debt and slack policies. Relatedly, future research using more detailed databases could then also explore the influence of country-specific characteristics on a broader range of debt policies (e.g., deb specialization, debt maturity and debt granularity) and on slack policies in new firms' initial year of operation.

A final limitation is related to the sole inclusion of independent new firms in the datasets used in this dissertation. Although there were important reasons for focusing on independent new firms only, mainly related to the differences between independent new firms and subsidiaries, future research could purposefully assess how being part of a group structure influences the results of this dissertation.

Although study 1 and 2 of this dissertation focus on firms' debt and slack policies, the same results are also found for other types of financial policies, i.e., accounts payable, accounts receivable and net credit. Trade credit policies are also found to be stable over time and to be driven by an imprint of firm's founder-CEO. Hence, the findings of the separate studies in this dissertation have implications for a broader range of financial policies than the ones examined. Therefore, an opportunity for future research is to adopt a longitudinal and an institutional perspective to examine other types of new firms' financial policies. This would advance our understanding of new firm financing.

5.4 Implications

5.4.1 Implications for entrepreneurs and managers

The different studies in this dissertation offer some important insights and recommendations for entrepreneurs and managers. First, this dissertation informs entrepreneurs and managers that they can have a long-term impact on firms' financial policies. Findings suggest that entrepreneurs and managers may find it difficult—or may be unwilling—to adapt firms' financial policies because preexisting policies, practices and behaviors push entrepreneurs and managers to keep firms' financial policies at a specific level. Therefore entrepreneurs and managers should be aware of the long-term impact of the financial decisions made when they arrive at a firm. This also implies that entrepreneurs and managers should be careful when setting firms' financial policies at a certain level.

Second, the high number of new firms that go bankrupt shortly after founding has raised questions about whether honest bankrupt entrepreneurs should be provided with a second chance by implementing a fresh start policy. This dissertation helps entrepreneurs and managers to better understand how a fresh start policy influences the credit availability to new firms. Results show that new firms use less debt if a fresh start is available relative to when a fresh start is not available in a country's personal bankruptcy laws. This is in line with the idea that financiers will tend to provide less debt when a fresh start is possible for bankrupt entrepreneurs. Therefore, it is important that entrepreneurs and managers are aware of the regulatory framework in the country where a new firm is founded as they need to attract the necessary financing sources to set up their business.

5.4.2 Implications for policy makers

The different studies in this dissertation also have relevant and important implications for public policy. The results of this dissertation suggest that policy makers can influence the

availability of financial resources for new firms. As new firms are important contributors to innovation, employment creation and economic growth, policy makers need to be aware of the importance that these firms dispose of the necessary financial resources. Results in this dissertation show that country-specific factors are important in explaining new firms' financial policies. As a response to the decline in entrepreneurship caused by lengthy bankruptcy procedures, social stigma and a lack of support for bankrupt entrepreneurs after firm failure, policy makers across the world tend to provide bankrupt entrepreneurs with a second chance by implementing a fresh start policy. The results of the last study indicate that new firms use significantly less debt financing if a fresh start is available in a country's personal bankruptcy laws. As such, this evidence sheds new light on the important policy question what impact a fresh start has.

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