The Impact of Financial Bootstrap Strategies on Value Added in New Ventures: A Longitudinal Study

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Abstract

Despite the widespread use of financial bootstrap strategies in new ventures, scholars have presented conflicting views on the relationship between these strategies and venture development. This paper studies the impact of financial bootstrapping on the level of value added at particular points in time and growth in value added across time. We use a longitudinal database comprising data from both questionnaires and financial accounts of 214 new ventures. Findings provide mixed evidence on the impact of financial bootstrapping on the level of value added in new ventures. For instance, ventures that use more finance from family and friends demonstrate lower levels of value added, while ventures that do not invest in their own buildings exhibit higher levels of value added. More significantly, financial bootstrapping has a consistently positive impact on the growth in value added across time. Although new ventures that use more owner funds, employ more interim personnel, incite customers to pay more quickly and apply for more subsidy programs start with lower or similar levels of value added, these ventures exhibit higher growth in value added across time (*180 words*).

1. Introduction

According to resource-based theories new ventures that rapidly mobilize more strategic resources are likely to develop a sustainable competitive advantage and generate above-normal returns compared to their resource constrained peers (Barney, 1991; Lee et al., 2001). Yet, it is often difficult if not impossible for new entrepreneurial ventures to mobilize all financial, human and other resources needed to fully develop across time (Baker and Nelson, 2005). Interestingly, entrepreneurs frequently pursue new opportunities despite their inability to mobilize the additional resources these opportunities seem to demand (Starr and MacMillan, 1990). Moreover, many entrepreneurial ventures prosper in the commonplace setting of severe and persistent resource constraints (Baker and Nelson, 2005). Overall, the above demonstrates that the process through which entrepreneurial ventures are able to overcome resource constraints is not well understood.

In a similar vein, the entrepreneurial finance literature is biased towards studying the process of buying resources with money and mobilizing external capital from investors like venture capitalists, business angels and financial institutions (Bhide, 1992). Yet, young ventures often experience limited access to external finance due to market imperfections, such as information asymmetries and high transaction costs (Berger and Udell, 1998; Cassar, 2004; Cosh et al., 2009). Furthermore, some entrepreneurs are unwilling to raise external finance because of fear of losing control over their ventures (Manigart and Struyf, 1997; Sapienza et al., 2003). As a result, the most important challenge for the majority of entrepreneurs is not to attract large amounts of external finance, but it is to reduce as much as possible the reliance on external finance (Bhide, 1992).

Bootstrap strategies may allow young ventures to pursue new opportunities without owning a sizeable resource base and without mobilizing large amounts of outside finance to buy more resources. Bootstrap strategies take two forms. First, it includes strategies that minimize the need for finance by securing resources at little or no cost. Second, it includes strategies to acquire resources without using bank finance or outside equity finance (Freear et al., 1995; Winborg and Landström, 2001; Harrison et al., 2004). More specifically, bootstrap strategies include the use of owner-related finance, minimization of accounts receivable, sharing and borrowing of resources, delaying payments, minimization of capital invested and using subsidy finance (Winborg and Landström, 2001).

Prior studies indicate that bootstrap strategies are widely used strategic practices especially in young and small ventures (Van Auken and Neeley, 1996; Winborg and Landström, 2001). Surprisingly, few empirical studies have addressed the question whether the use of bootstrap finance promotes or constrains venture development (see Ebben and Johnson, 2006; Harrison et al., 2004). The goal of this study is therefore to provide more insight into how bootstrap strategies impact the development of new ventures across time. This is important as some scholars indicate that the use of bootstrap strategies may be undesirable because of the high opportunity cost amongst other reasons (Starr and MacMillan, 1990). Moreover, bootstrap finance is sometimes treated as a second-best strategy that becomes particularly important when access to external finance is more difficult (Van Auken and Neeley, 1996; Van Auken, 2005). Others consider the use of bootstrap strategies as desirable, as it helps to focus entrepreneurs on the efficient and more creative use of resources (Bhide, 1992; Carter and Van Auken, 2005). The central research question in this study is: how does the use of bootstrap strategies at startup impact subsequent value added generation in new ventures?

In order to address this question, we use a unique longitudinal database that combines both data collected through questionnaires at the time of startup and yearly financial accounts of 214 new ventures. We make a critical distinction between the impact of financial bootstrap strategies on the level of value added at particular points in time and growth in value added across time (Henderson, 1999). Results demonstrate that some bootstrap techniques only influence the level of value added in new ventures. Specifically, new ventures that use more finance from family and friends consistently demonstrate lower levels of value added, while ventures that do not invest in their own buildings demonstrate higher levels of value added. Some other bootstrap techniques show both level and growth effects on value added. While new ventures that use more own funds and subsidy finance initially exhibit lower levels of value added, these ventures demonstrate higher growth in value added across time compared to their peers. Finally, some bootstrap techniques only show growth effects on value added. Although new ventures that employ more interims and minimize days of sales outstanding initially show similar levels of value added, they exhibit higher growth in value added across time compared to their peers.

The rest of the paper is organized as follows. We first present a theoretical framework on the impact of financial bootstrap strategies on new venture development. Next, we outline the methods, including the sample, measures and method of analysis. Then, we present the main research findings. Finally, we conclude by discussing the results from both a theoretical and practical perspective.

2. Literature and theory development

Common theoretical assumptions about the nature of resources and resource environments offer little guidance for understanding how some ventures survive and sometimes prosper in

resource scarce environments (Baker and Nelson, 2005). The early finance literature indicates that in perfect financial markets there is sufficient and adequate finance for all value creating projects and hence finance decisions do not influence firm value (Modigliani and Miller, 1958). Firms do not face resource constraints, as they are able to raise sufficient external finance to buy the necessary resources. Both theoretical and empirical work, however, challenge the paradigm of perfect financial markets (Berger and Udell, 1998). In the presence of market imperfections, investors may ration capital and value creating projects may be denied financing or only be able to obtain certain types of finance (Cosh et al., 2009). Access to bank finance and new equity finance may be particularly problematic for new ventures as these ventures lack financial and operating histories, lack collateral and face a high risk of failure compared to more mature ventures (Berger and Udell, 1998; Cassar, 2004; Cosh et al., 2009).

Bootstrap strategies may explain why ventures are able to pursue new opportunities without owning a sizeable resource base. The current bootstrap literature, however, is largely limited to describing the use of distinct bootstrapping techniques (Freear et al., 1995; Van Auken and Neeley, 1996; Winborg and Landström, 2001). These studies have indicated the critical nature of bootstrap finance in many ventures and demonstrated the existence of significant variation in the use of bootstrap finance across ventures. More recently, research has focused on the antecedents of using bootstrap strategies (Harrison et al., 2004; Van Auken, 2005; Carter and Van Auken, 2005; Ebben and Johnson, 2006). This stream of research shows how the use of bootstrapping depends upon venture size, growth ambitions, the technological orientation of ventures, the stage of development of ventures, venture risk and the perceived ability of owners. However, empirical studies focusing on the consequences of using bootstrap

strategies are generally lacking. We propose that financial bootstrapping strategies may impact both the level of value added and growth in value added across time.

In Figure 1 we demonstrate possible level and growth effects of financial bootstrapping on value added in new ventures by using hypothetical data. Scholars have provided ample evidence that these two effects may be fundamentally different (Henderson, 1990). The level effect (Figure 1A) implies that financial bootstrapping causes differences in the amount of value added produced at particular points in time. In Figure 1A, the initial level of value added in venture A is higher than the initial level of value added in venture B. Given that these ventures do not demonstrate growth in value added across time, initial differences in the level of value added are sustained throughout time. The growth effect (Figure 1B) indicates that although initial levels of value added may be similar, ventures that use more or less bootstrap finance may differ significantly in their growth in value added across time. In Figure 1B, venture A and venture B demonstrate similar initial levels of value added. Yet, the growth in value added across time is significantly higher in venture A compared to venture B. Obviously the two effects may occur together and ventures that use more or less bootstrapping may exhibit both different initial levels of value added and different growth rates in value added across time.

Insert Figure 1 about here

The literature has offered contradictory views on the value of financial bootstrapping for new venture development. One view indicates that financial bootstrapping strategies will benefit venture performance. The resource constraint theory argues that companies can prosper in an environment characterized by resource constraints and this by recombining the current

resources and by exploiting physical, social and institutional inputs, which other businesses reject or ignore (Baker and Nelson, 2005). For instance, entrepreneurs may use their network ties to gain access to resources that would otherwise be unavailable or they may rely on specific government programs that other businesses ignore. Such bootstrap strategies may offer ventures performance benefits from startup by allowing them quick access to critical and may allow them to pursue more opportunities over time. Hence, bootstrap strategies may positively influence the level of value added and growth in value added across time.

In addition, the discipline of bootstrapping may force ventures to solve problems which would remain hidden and unresolved if ventures automatically address high cash burn rates with requiring more external finance (Bhide, 1992). Bootstrap strategies may allow new ventures to develop a competitive advantage by creating an environment where everyone within the venture makes the most efficient use of the limited amount of resources that are available (Timmons, 1999; Lahm and Little, 2005). Through the increased efficiency in ventures that actively bootstrap, the level of value added in these ventures is expected to be consistently higher compared to those ventures that raise more external finance. Moreover, ventures that actively work towards eliminating efficiencies may invest the amount of finance that is saved in new growth opportunities. This may cause higher growth in value added across time in those ventures that actively bootstrap.

Finally, premature funding by external investors, such as venture capital firms and business angels, may hamper the future flexibility of new ventures (Bhide, 1992; Steier and Greenwood, 1995). Entrepreneurs that succeed in raising external finance may have to adhere to short-term investor criteria (Bhide, 1992). Outside investors typically do not offer all necessary finance at once, but rather require entrepreneurs to fulfil particular milestones

before they will invest further (Gompers, 1995). If entrepreneurs want to change the strategic direction of their ventures this becomes more difficult as outside investors need to be convinced that this shift is needed as well (Bhide, 1992). This may be problematic as strategic flexibility is important for venture growth especially in uncertain and volatile environments (Shimizu and Hitt, 2004). Many bootstrapping techniques are much more flexible compared to traditional finance alternatives. For instance, bootstrap finance is typically readily available and does neither require a business plan nor collateral (Van Auken, 2005 Carter and Van Auken, 2005). Hence, entrepreneurs that more heavily rely on financial bootstrapping startegies at startup may more quickly react to new opportunities and change the strategic direction of their ventures more easily whenever deemed necessary. This is expected to benefit both the level of value added and growth in value added across time. The above arguments lead to the following related hypotheses:

Hypothesis 1A: The use of bootstrap strategies at startup will have a positive impact on the *level* of value added in startups.

Hypothesis 2A: The use of bootstrap strategies at startup will have a positive impact on the *growth* in value added of startups across time.

Nevertheless, there also exist multiple arguments, which propose that financial bootstrapping is only a second-best strategy and may even hamper the future development of entrepreneurial ventures. Traditional finance studies indicate that the inability (Hubbard, 1998; Carpenter and Petersen, 2002) or unwillingness (Kaplan and Zingales, 1997) to raise external finance hampers venture development. Internal finance is typically unavailable or largely insufficient to finance growth and this problem is especially acute in private ventures that already tend to

be undercapitalized (Holtz-Eakin et al., 1994). A further reduction of the asset base by implementing all sorts of bootstrap strategies may constrain ventures from growing as fast as would be the case when large amounts of external finance are being raised. Indeed, there is significant research indicating how ventures with at least some organizational slack are more innovative and perform better over time (Nohria and Gulati, 1996; George, 2005). Moreover, external investors do not necessarily constrain venture development, but may play an active role in the professionalization of ventures as well (Hellmann and Puri, 2002).

In addition, those entrepreneurs that actively engage in employing financial bootstrap strategies may spend too much valuable management time on implementing marginal savings while neglecting other critical tasks in their ventures (Lahm and Little, 2005). Moreover, while financial bootstrapping strategies may allow access to resource at little or no cost these resources may not be entirely suitable for the venture. For instance, while second hand equipment may allow ventures access to relatively cheap resources, a venture with state-of-the-art equipment may be able to provide superior products or services. This may cause lower initial levels in value added and negative growth in value added across time.

Finally, while entrepreneurs may use their social contacts to access resources without extensive financial commitments, opportunity costs of such strategies may be high, given the lack of formal commitments, uncertainty and possibilities of opportunistic behavior (Starr and MacMillan, 1990). Moreover, particular bootstrap startegies such as delaying payments may have a high opportunity cost as well (Van Auken, 2005). When used excessively, delaying payments may, for example, lead to deteriorating relationships with stakeholders (Winborg and Landström, 2001). In a response to ventures that delay payments excessively, stakeholders may require direct payment for future transactions or even cease business

relationships. Delaying payments may also signal to outside stakeholders that the venture is in financial trouble making risk-averse stakeholders unwilling to transact with the venture. The above arguments suggest the following alternative hypotheses:

Hypothesis 1B: The use of bootstrap strategies at startup will have a negative impact on the *level* of value added in startups.

Hypothesis 2B: The use of bootstrap strategies at startup will have a negative impact on the *growth* in value added of startups across time.

3. Method

3.1. Sample and data collection

This study builds on a database comprising the population of companies that were formally incorporated in Flanders (a region in Belgium) between September 2002 and August 2003 and have less than 50 employees. The population comprises 2,679 companies. These companies may be newly created companies as well as companies that have been established through mergers, acquisitions or restructuring activities. In order to obtain detailed information on these companies we combined data from both questionnaires and financial accounts.

All companies in the population were mailed a questionnaire in September 2003. Entrepreneurs were questioned close to the time of incorporation in order to minimize recollection biases. In addition, surveying entrepreneurs close to startup minimizes survival bias (Cassar, 2004). After the initial mailing, companies received a written reminder to complete the questionnaire and telephone calls were conducted to further increase the

response rate. We received 637 completed questionnaires. This is a 29.40% response rate based on the number of startups we were able to reach through postal mail or telephone contact. While 231 questionnaires related to newly created companies, 406 related to previously existing companies that continued under a new form. In order to focus on real startups, only the newly created companies are retained in the current dataset.

The questionnaire was extensive and started with questions relating to the founding itself (e.g., founding date, motivations to startup, whether the company already existed before the formal registration). It also included questions with respect to the management team (e.g., prior experience of managers), the use of different government support programs, policies with respect to sales and purchases (e.g., whether the company cooperates with other companies for sale or purchase), human resource policies (e.g., whether the company employees interims and how many), innovation and technology (e.g., whether the company is involved in process or product innovation activities) and location of the business (e.g., who is the owner of the building where the company is located). Moreover, an important part of the questionnaire focused on the financial policies within the startup. This gave us detailed insights in the use of different sources of finance (e.g., owner finance, finance from family and friend, bank finance) and their respective importance.

In addition to the survey data, yearly financial statement data were collected on the respective startups. These were retrieved from the BEL-FIRST database (*Bureau van Dijk*), which includes the financial accounts of nearly all Belgian companies. All Belgian companies are required by law to file detailed financial accounts. For each year more than 50 variables from the financial accounts of each company (balance sheet, profit and loss account) are recorded. Only 12 companies could not be found in BEL-FIRST, which indicates that these companies

did not survive their first year of incorporation. We further excluded 5 companies from the database, because they were obvious outliers in terms of size. One of these companies, for example, was a relatively big utilities company. This reduced the final sample to 214 startups.

3.2. Variables

Dependent variable. The dependent variable in this study is *value added* defined as the value of production minus production costs. Value added is a particularly good performance measure in the current research context. While sales may be used as an alternative measure, only larger companies are required to report sales figures in their financial accounts. Hence, using sales as our dependent variable would result in selecting only the larger startups. Moreover, while sales are generally considered less industry dependent compared to employment or total assets (Delmar et al., 2003), value added is probably even more suitable than sales as it also incorporates the production costs which dependent on the industry as well. Although employment and total assets might also be used as alternative measures of performance, these measures are problematic as they are not only industry dependent, but startups that engage in bootstrapping may gain access to employees (e.g., interims) or assets (e.g., buildings from other companies) that are not owned by the startups themselves. Hence, these startups may create value and grow despite owning only a limited pool of resources (Baker and Nelson, 2005). Finally, we refrain from using net income or net worth because variability in the tax treatment of income in private firms might undermine the reliability of these estimates of performance (George, 2005).

The necessary data to calculate value added are obtained from the yearly financial accounts. We track value added in the respective ventures from 2003 up to 2007. This five-wave longitudinal research design allows us to examine both level and growth effects. Longitudinal

box plots (not presented) demonstrate that the distribution of value added is skewed. We therefore use the natural logarithm of value added (plus a constant) in all subsequent analyses as a normalizing transformation.

Independent variables. All recent publications on financial bootstrapping are built on the bootstrapping methods identified by Winborg and Landström (2001) based on a sample of small Swedish firms (Ebben and Johnson, 2006; Carter and Van Auken, 2005; Van Auken, 2005; Harrison et al., 2004). The typical approach in these studies is to ask entrepreneurs through a survey to rate the use of multiple financial bootstrap strategies on a five-point scale. We take a different approach and combine survey data with financial accounts data on the actual use of financial bootstrapping. For instance, entrepreneurs are not asked to rate their use of leasing on a five-point scale, but the industry-adjusted ratio of leasing on total assets is calculated from the financial accounts. As another example, we do not ask founders to rate their use of owner-related finance on a five-point scale, but calculate the actual amount of finance provided by the founding team. This has the advantage of providing richer and reliable data on the actual use of financial bootstrapping. Table 1 offers an overview of the bootstrap financing strategies as developed by Winborg and Landström (2001), the corresponding bootstrap variables used in our study and their respective data sources.

Insert Table 1 about here

We will group our bootstrap variables following the classification by Winborg and Landström (2001). A first group of bootstrap strategies relate to whether the owner(s) fully used their own financing means. The questionnaire probed whether entrepreneurs invested their own funds. On average, about 68% of the startup capital is provided by the founders. While

average startup capital equals 138,750 euro, median amount of startup capital equals only 20,000 euro. In the average startup, family and friends provide only 3.66% of startup capital. Based on these percentages, we calculate the natural logarithm of the *amount of own funds* and the natural logarithm of *the amount of funds from family and friends*. We created a dummy *personal bank loan* equal to one when the founders used this source of finance and zero otherwise. Some 7% of the founders used personal bank loans as a source of finance at startup. Overall, neither family and friends nor personal bank loans are frequently used in our research setting.

Second, we asked whether firms engaged in joint utilization strategies. We created a dummy variable *joint premises* when the company did not own the buildings in which it operated and zero otherwise. The vast majority of new ventures (81%) do not own their premises but rather use buildings owned by others[1]. Furthermore, we created dummy variables *cooperation for purchase* and *cooperation for sales*, which equal one when startups engage in joint purchase or sales respectively and zero otherwise. Only 21% of the startups engage in joint purchase and 14% engage in joint sales strategies.

A third group of bootstrap strategies relate to delaying payments. The extent to which the sample firms used *leasing* is calculated as the ratio of leasing to total assets. Given that the use of leasing may be industry-dependent, the industry mean ratio of leasing on total assets is subtracted from the raw leasing on total assets ratio. As such, positive values indicate that a startup uses more leasing than its peers and negative values indicate less use of leasing compared to industry peers. The self-reported *days payables outstanding* (DPO) is on average 28 days. DPO are again industry adjusted by subtracting the industry average from the raw

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[1] In general if buildings are not owned by the venture itself they are owned by other companies. In cases where the venture operates from the home of (one of) the founder(s) the venture itself did not own the building and it was hence also coded as using the buildings of others.

number of DPO. Finally, the industry-adjusted ratio of *delayed payment of taxes* on total assets is adjusted in the same way.

Fourth, we measured whether the firms engaged in minimizing investments by calculating the industry-adjusted ratio of *inventory* on total assets. We also checked the extent to which firms used cheap and flexible human resource policies in their first year of operation. Using more *interim* workers rather than hiring employees on the firm's payroll reduces the fixed costs of the firm and decreases the negative cash flows in times that the employees are not fully needed. On average, a startup used 0.60 interim workers with a maximum of 35 interim workers. *Student jobs* are a cheap type of labor in Belgium thereby reducing the average cost per employee. The average company in the sample used 0.28 students in its start-up year. Finally, *internships* may provide a firm with human resources at almost no cost. The average sample firm uses 0.16 interns in its start-up year. There is again a wide variation in the extent to which the sample firms used flexible human resource policies. We again adjust these raw measures for the respective industry averages.

Fifth, we measured whether firms minimized their accounts receivables. We asked for the average number of *days sales outstanding* (DSO) in the questionnaire; this amounts to 31 days but firms show a large variation in the extent they minimize DSO. We adjust the raw number of DSO for the industry average. A final bootstrap strategy considered by Winborg and Landström (2001) is the extent to which a firm uses government subsidies. We enumerate all 15 subsidy programs relevant for startups and asked for which subsidies the firm applied at startup. The variable *subsidies* counts the number of subsidy programs for which the startup applied. The average startup applied for 1.14 types of subsidies. The variable was

subsequently adjusted for the average use of subsidies in a particular industry, as particular subsidy programs are more important for companies in specific industries.

Control variables. We controlled for a number of factors, as growth is not only determined by the use of financial bootstrap strategies, but also by other factors. Following control variables are included in the multivariate analyses. First, the *number of founders* in the founding team is included as a measure of the generic human capital of the founding team (Colombo and Grilli, 2005). The average number of founders is slightly higher than two. Only 15% of the firms are founded by a single entrepreneur. Second, we include the (average) number of *years of management experience* of the founder (or the founding team). This is a measure of the specific human capital of the founder or team (Colombo and Grilli, 2005). Having more human capital is expected to lead to higher growth.

Some innovation and finance related variables were measured at startup through the questionnaire and used as control variables. It was assessed whether the venture followed innovation strategies, differentiating between *product innovation* (57% of ventures) and *process innovation* (47% of ventures). Overall, more innovative ventures are expected to achieve higher growth rates. Next, it was asked whether the venture intended to invest shortly after startup, as a measure of the *growth ambition* of the venture. Almost half of the new start-ups (48%) indicated they would do so. The questionnaire also recorded whether the venture has experienced *cash flow problems* in the first year of operations. Entrepreneurs were asked to indicate whether they have experienced each of five different types of cash flow problems. On average, firms have experienced 1.06 types of cash flow problems at startup. Finally, the natural logarithm of the amount of assets in the first year of operation is included to account for the *initial size* of the startup.

We distinguish between eight broad *industries* by creating industry dummy variables. Almost 28% of startups provide business services, with another 24% active in the wholesale or retail sector, 15% in the restaurant and hotel industry and 10% in construction. The other industries represent less than 10% of the sample. Table 2 presents the descriptive statistics and correlations. Correlations between the variables are generally low. The highest correlation (0.51) is between days of sales outstanding and days of purchases outstanding.

Insert Table 2 about here

3.3. Analysis

Many standard statistical techniques, such as Ordinary Least Squares (OLS) regressions, are not appropriate to use when data consist of repeated measures that are correlated within subjects (e.g., ventures) as it invalidates the basic assumption of independence (Fitzmaurice et al., 2004). Researchers need to account for the correlation between responses when estimating regression parameters otherwise they can make misleading and even incorrect inferences. This problem is particularly severe when correlations across time are high (Ballinger, 2004), which is the case in the current study. For instance, the correlation between value added realized in 2003 and 2004 by the startups in our sample equals 0.58. The correlation between value added realized in 2003 and 2007 still equals 0.21. We use the Generalized Estimating Equation (GEE) approach to estimate more efficient and unbiased regression parameters relative to OLS regressions, because GEEs permit the specification of a working correlation matrix that explicitly accounts for within-company correlation of responses (Ballinger, 2004). Specifically, we use a one-period autoregressive correlation structure to set the within company correlations as an exponential function of this lag period.

4. Results

The results of the multivariate analyses focusing on the impact of financial bootstrapping on value added are presented in Table 3. Model 1 only includes control and industry variables. We gradually develop more complex models. In model 2 we add the bootstrap variables to capture potential level effects. In this model the bootstrap variables indicate whether ventures that use particular bootstrap techniques exhibit differences in their levels of value added. In model 3 the bootstrap variables are interacted with time to capture both level and growth effects. In this model the bootstrap variables indicate how ventures that use more or less of a bootstrap technique differ in their initial levels of value added, while the interaction terms between the bootstrap variables and time indicate how value added increases (or alternatively decreases) over time in ventures that use more or less of a particular bootstrap technique. Next, insignificant interaction variables between bootstrapping techniques and time are removed in Model 4 and the insignificant bootstrap variables are removed in Model 5 in order to create parsimonious models[2]. The discussion of the results focuses on Model 5.

Insert Table 3 about here

The control variables indicate that new ventures with growth ambition generate significantly higher levels of value added compared to new ventures that lack any growth ambition. Larger ventures also create significantly higher levels of value added compared to their smaller counterparts. While the coefficients of the number of founders and founder experience variables are positive they are not significant. Hence, we fail to find a significant direct effect of human capital on the level of value added. This does not imply that owners are

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[2] Note that when the interaction term between a particular bootstrap variable and time is significant, we leave the main effect in the model regardless of its significance. This is necessary for an efficient estimation of the interaction effect (Peixoto, 1987).

unimportant, as we will demonstrate below that the funds provided by owners do influence value added in new ventures.

In the group of owner-related bootstrapping strategies the use of own funds has a negative level effect, which implies that new ventures that rely more heavily on funds of the founding team members initially realize less value added. However, there is a positive growth effect, which indicates that new ventures that rely more heavily on own funds exhibit higher growth in value added across time. The use of finance from family and friends has a negative level effect. Hence, companies that raise more finance from family and friends exhibit lower levels of value added across time. It is important to note that although in this case the growth effect is positive, it is not significant. The use of personal bank loans neither benefits nor constrains new venture performance.

Joint utilization techniques may be important to new venture development as well. New ventures that do not invest in their own premises exhibit a significant level effect indicating that they realize higher levels of value added. There is no significant growth effect, however, which implies that sharing premises does not lead to an accumulation of advantages across time. The cooperation for purchases and the cooperation for sales variables have no significant effect on the value added realized by new ventures.

Delaying payment bootstrapping strategies have no significant effect on the performance of new ventures. In addition, many bootstrapping techniques that minimize investments are not significant. One important exception is the use of interim personnel. Although there is no difference in the initial level of value added realized by startups that use more or less interim personnel, growth in value added is significantly higher for those new ventures that use more

interims. Overall, it indicates that flexible human resource policies benefit new venture development.

Results further indicate that minimizing accounts receivables is a valuable bootstrapping strategy. While the industry-adjusted days of sales outstanding does not affect the initial level of value added, new ventures with lower levels of DSO demonstrate higher growth rates in value added compared to ventures that collect their sales more slowly. Firms with lower levels of DSO make more use of bootstrapping as they employ their assets more effectively and collect cash sooner. Hence, the negative growth effect of DSO is an indicator of the positive impact of bootstrapping on new venture performance across time.

Finally, subsidy finance plays an important role in the development of new ventures. New ventures that apply for more government programs at startup initially generate significantly lower amounts of value added. Yet, ventures that apply for more government programs at startup also demonstrate significantly steeper growth in value added across time compared to ventures that did not apply for specific government programs or applied to a lesser extent.

Overall, evidence on the impact of financial bootstrapping strategies on the level of value added is mixed. Consistent with hypothesis 1A ventures that use the buildings owned by others exhibit higher levels of value added that are sustained across time. Nevertheless, we also find evidence consistent with hypothesis 1B. More specifically, ventures that use more finance from family and friends exhibit lower levels of value added. Moreover, ventures that use more owner funds and more subsidy finance also exhibit lower levels of value added at startup. More significantly, however, financial bootstrap strategies allow new ventures to grow faster across time. Consistent with hypothesis 2A ventures that use more owner funds,

employ more interims, incite customers to pay more quickly and apply for more subsidies all exhibit steeper growth in value added across time.

5. Discussion and implications

The goal of this paper was to gain a deeper understanding of how bootstrap strategies impact the development of new ventures. Previous studies have indicated that entrepreneurial ventures engage in different types of bootstrap strategies, but the literature is inconclusive on the impact these strategies have on venture development across time. There are arguments to expect both a positive impact and a negative impact of financial bootstrapping on new venture development. We employed a longitudinal research strategy that relates the use of bootstrapping strategies at startup in 214 Belgian ventures to the level of value added and growth in value added across time.

Results demonstrate that bootstrap strategies that have a significant impact on the level of value added at startup may be both negative and positive. Specifically, new ventures that rely more extensively on owner funds, funds from family and friends and subsidy finance exhibit lower levels of value added. However, new ventures that do not invest in buildings but rather use the buildings from others demonstrate higher levels of value added across time. The growth effects are different from the level effects however. Specifically, bootstrap strategies that have a significant impact on growth are always enhancing the growth of new ventures across time. New ventures that use more own funds, more interim personnel, more subsidy finance and decrease the days of sales outstanding exhibit higher growth in value added across time.

We also showed that several bootstrap strategies have no impact on venture development. Using personal bank loans, cooperation for purchase or sales, delaying payments either to suppliers or through the use of leasing, minimizing inventory, employing students and interns do not impact the level and growth of value added in new ventures. Hence, these bootstrapping techniques neither enable nor constrain new venture development. Despite the statistical insignificant relationship, there is an important economic consequence to this finding. In particular, given that bootstrap strategies decreases the amount of external finance needed this study indicates that entrepreneurs who rely more heavily on financial bootstrapping at startup may realize the same results with less need for costly outside finance. This hence minimizes the cost of funding and creates value for shareholders. Furthermore, it enables entrepreneurs to retain a larger fraction of the equity, which may be critical for the majority of entrepreneurs, who not only strive to maximize shareholder wealth, but generally want to keep control over their ventures as well (Sapienza et al., 2003).

To the best of our knowledge this is the first study to link startup bootstrap strategies with the future development of new ventures in a truly longitudinal design. While traditional resource-based theories offer little guidance for understanding why some ventures prosper without owning a significant resource base, our study has demonstrated the usefulness of bootstrap theories. We have demonstrated how entrepreneurial ventures may perform and grow by actively implementing bootstrap strategies that reduce the need for large amounts of external finance. Moreover, contrary to most previous studies that measured bootstrap strategies by asking entrepreneurs to retrospectively report on their use of financial bootstrapping during the startup phase (e.g., Ebben and Johnson, 2006), this study has measured bootstrap strategies at most one year after startup. Due to the reduced time between startup and surveying, the potential that survivorship and recall biases will confound our results is limited

(Cassar, 2004). Furthermore, we did not use the traditional five-point likert scales to measure financial bootstrapping (e.g. Winborg and Landström, 2001) but rather combined data from questionnaires and financial accounts. We believe these measures may lead to better estimates of the actual use of financial bootstrapping. Finally, the combination of the different data sources eliminated concerns with respect to common method bias.

As with all research this study also has limitations. First, we do not focus on particular contingencies that may play on the relationship between financial bootstrapping and new venture development. This raises important questions for future research. For instance, are bootstrapping strategies more valuable for new ventures that are more or less finance constrained? What about the role of bootstrapping in new ventures with and without significant growth ambitions? Second, we focused on the impact of bootstrapping strategies measured at startup on new venture development. Yet, the use of bootstrapping changes as ventures develop (Ebben and Johnson, 2006). Future research may study the relationship between changes in financial bootstrapping and venture performance across time. Third, care must be taken in generalizing the results outside the specific research context. Our sample of new ventures is drawn from Flanders, which is a small, export-intensive economy located in the northern part of Belgium. Nevertheless, we believe that Flemish new ventures are probably more similar to the average new venture in many other regions, compared to prior studies that exclusively focused on financial policies in large quoted companies or new ventures operating in very specific, one of a kind environments, such as Silicon Valley.

Despite its limitations, the study provides valuable insights to entrepreneurs, educators and government officials. Entrepreneurs should be made aware that bootstrap strategies are valuable and should be fully explored as possible resource acquisition strategies at startup.

Some bootstrap strategies even lead to higher value added generation while enabling entrepreneurs to retain control over the venture. Entrepreneurs for whom external finance is often a scarce resource can hence strongly benefit from exploring bootstrap strategies to start and develop their ventures. Using own funds at startup, employing interims, inciting customers to pay early and applying for subsidy finance all lead to higher growth in value added, as the financial resources that are saved through these strategies can be deployed more effectively in value-enhancing activities.

Business schools and government agencies should actively strive to make financial bootstrap strategies better known amongst (potential) entrepreneurs. Courses on financial management and entrepreneurship still largely focus on the process of raising large amounts of finance from financial institutions and venture capital investors. Bootstrapping strategies are generally discussed only briefly, while these strategies may be much more suitable for the average entrepreneur (Lahm and Little, 2005). Our findings are informative for government officials as well. We have demonstrated that subsidy finance is a value bootstrap strategy, which benefits the future growth of new ventures. Hence, government agencies may have to work towards increasing awareness in the entrepreneurial community of the numerous government programs available to new ventures.

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FIGURE 1

The Impact of Financial Bootstrapping Strategies on New Venture Performance: Level versus Growth Effects

A. Level effect   **B. Growth effect**
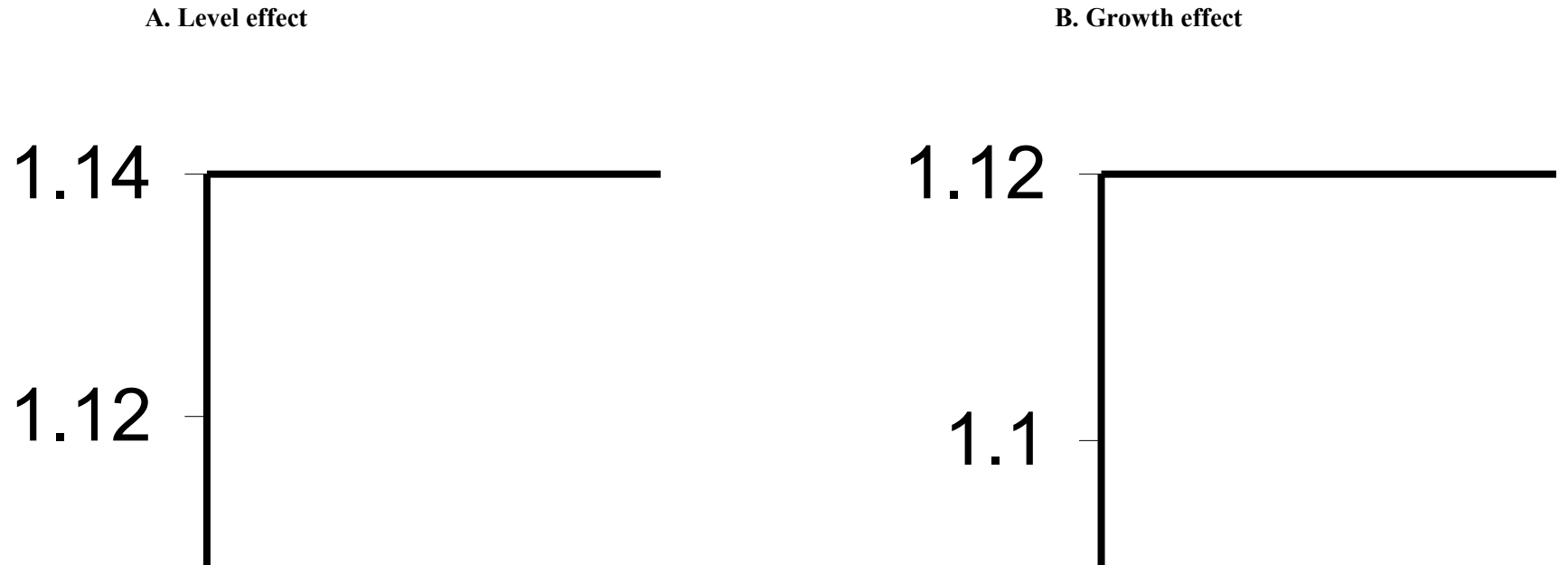
Where □ denotes the observed performance of company A and o denotes the observed performance of company B at different points in time. The straight line represents the (predicted) growth curve of company A and the dashed line represents the (predicted) growth curve of company B. The data in Figure 1A and 1B are hypothetical and one may, for instance, assume that value added is measured in millions of euro.

TABLE 1: Correspondence between Winborg and Landström's (2001) bootstrap variables, the variables in this study, and their data source

Winborg and Landström (2001)	This study [Data Source]
Owner finance:	
. Use of manager's credit card	. Amount of own funds invested at startup [Questionnaire & Financial accounts]
. Loan from relatives/friends	
. Withholding manager's salary	. Amount of funds from family and friends invested at startup [Questionnaire & Financial accounts]
. Assignments in other businesses	. Where personal bank loans used at startup? [Questionnaire]
. Relatives working for non-market salary	
Joint utilization:	. Does the company own its premises? [Questionnaire]
. Borrow equipment from others	
. Own equipment in common with others	. Do you cooperate with other organisations for purchases? [Questionnaire]
. Co-ordinate purchases with others	. Do you cooperate with other organizations for sales? [Questionnaire]
. Practice barter instead of buying/selling	
Delaying payments:	
. Lease equipment instead of buying	. Leasing / Total assets [Financial accounts]
. Delay payment to suppliers	. How many days do suppliers take to pay? [Questionnaire]
. Delay payment of value-added tax	
	. Delayed payment of taxes / Total assets [Financial accounts]
Minimizing investment:	
. Use routines in order to minimize stock	. Inventory/Total assets [Financial accounts]
. Best conditions possible with suppliers	. Number of interims, students and interns employed at startup [Questionnaire] [1]
Minimizing accounts receivable:	
. Cease business relations with late payers	. How many days do customers take to pay? [Questionnaire]
. Use routines for speeding up invoicing	
. Use interest on overdue payment	
. Offer same conditions to all customers	
Subsidy finance:	
. Subsidy from County Administrative Board	. Number of government programs applied for at startup. We enumerated 15 possible subsidy programs targeted towards startups [Questionnaire]
. Subsidy from Swedish National Board for Industrial & Technical Development	

[1] While the study by Winborg and Landström (2001) originally included bootstrapping techniques related to using temporary employees these where dropped from the cluster analysis. More recently, these techniques have been reintroduced by Carter and Van Auken (2005) as part of minimizing investments.

TABLE 2: Descriptive Statistics and Correlation Matrix

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1 Value added [a]	5.48	0.72	1.00																					
2 Own funds [a]	2.70	1.52	0.04	1.00																				
3 Funds from family & friends [a]	0.20	0.74	**-0.24**	-0.04	1.00																			
4 Personal bank loan	0.07	0.26	-0.07	**-0.15**	0.01	1.00																		
5 Joint premises	0.81	0.39	0.06	0.04	0.13	-0.01	1.00																	
6 Cooperation for purchase	0.21	0.41	0.03	0.03	-0.07	-0.01	0.04	1.00																
7 Cooperation for sales	0.14	0.35	0.08	0.13	-0.10	-0.06	-0.04	**0.34**	1.00															
8 Leasing [b]	0.00	0.06	0.00	0.07	-0.04	0.10	0.02	-0.02	0.07	1.00														
9 Days purchases outstanding [b]	0.06	18.25	0.10	0.12	-0.11	0.04	0.07	0.03	0.01	**0.15**	1.00													
10 Delay payment of taxes [b]	0.00	0.04	0.00	-0.06	0.05	-0.05	0.06	0.05	-0.07	-0.06	-0.03	1.00												
11 Inventory [b]	0.00	0.13	-0.05	0.04	0.05	-0.02	**0.16**	0.05	0.05	-0.02	-0.03	-0.02	1.00											
12 Interims [b]	0.00	2.97	**0.19**	0.05	-0.01	**0.17**	0.04	0.07	0.02	-0.07	0.05	0.01	-0.06	1.00										
13 Students [b]	0.00	1.36	0.08	0.02	-0.06	-0.02	-0.08	0.01	0.03	-0.03	-0.01	0.03	0.01	**0.28**	1.00									
14 Interns [b]	0.00	0.82	0.00	0.01	-0.01	0.07	0.05	-0.02	-0.02	**0.45**	-0.07	-0.04	-0.04	0.06	-0.04	1.00								
15 Days of sales outstanding [b]	0.20	23.46	**0.18**	**0.22**	-0.03	0.03	0.02	-0.02	**0.18**	0.09	**0.51**	-0.04	-0.02	0.05	-0.03	0.00	1.00							
16 Subsidies [b]	0.02	1.36	**-0.17**	0.05	0.03	0.02	-0.07	-0.03	0.00	-0.07	**0.22**	-0.11	0.10	-0.01	0.03	0.00	**0.16**	1.00						
17 Number of founders	2.32	1.16	**0.17**	**0.19**	**0.16**	-0.01	0.06	-0.01	-0.09	-0.04	0.11	0.02	0.04	0.12	-0.02	-0.05	**0.15**	0.09	1.00					
18 Management experience [a]	2.10	0.80	0.03	**0.24**	-0.02	0.03	**-0.14**	0.11	0.04	0.06	**0.17**	0.01	0.01	-0.08	-0.03	-0.05	0.02	-0.09	0.02	1.00				
19 Process innovation	0.47	0.50	0.08	0.07	0.00	-0.04	0.05	**0.18**	0.06	0.00	0.11	-0.13	0.06	-0.04	0.02	-0.01	0.02	0.05	0.03	0.03	1.00			
20 Product innovation	0.57	0.50	-0.09	-0.02	0.04	0.02	0.09	-0.03	0.12	-0.01	**0.18**	**-0.17**	0.12	0.00	0.06	0.09	0.12	**0.21**	0.02	-0.07	0.11	1.00		
21 Cashflow problems	1.06	1.29	0.06	-0.04	0.04	0.12	-0.06	0.04	0.09	0.03	**0.16**	0.07	0.08	-0.03	-0.03	-0.03	**0.28**	0.06	**0.18**	0.06	0.12	0.06	1.00	
22 Growth ambition	0.48	0.50	0.07	**0.14**	-0.09	0.03	0.10	0.10	**0.17**	-0.01	**0.18**	-0.06	0.03	**0.17**	0.04	0.07	**0.18**	0.08	-0.03	-0.06	**0.18**	**0.19**	-0.01	1.00
23 Initial size [a]	5.30	1.26	**0.45**	**0.35**	**-0.16**	-0.13	**-0.19**	-0.05	**0.16**	0.00	**0.19**	-0.11	-0.07	**0.14**	0.08	-0.07	**0.25**	**0.14**	**0.23**	**0.14**	**0.22**	-0.03	0.09	**0.14**

Descriptive statistics and correlations at startup (Time = 0). Number of ventures = 214. **Bold**: Correlations significant at 0.05 level.

[a] Natural logarithm.

[b] Industry-adjusted variables

TABLE 3: Financial Bootstrap Strategies as Predictors of Performance

	Model 1:	Model 2:	Model 3:	Model 4:	Model 5:
Intercept	3.719 ***	3.528 ***	3.717 ***	3.706 ***	3.771 ***
Number of founders	0.056	0.058	0.059	0.058	0.059
Management experience	-0.002	0.018	0.015	0.016	0.017
Process innovation	-0.007	0.005	0.005	0.005	0.006
Product innovation	-0.020	0.022	0.023	0.024	0.014
Cashflow problems	-0.052 **	-0.041	-0.041	-0.040	-0.040
Growth ambition	0.182 ***	0.139 *	0.140 *	0.141 *	0.139 *
Initial size	0.279 ***	0.292 ***	0.292 ***	0.292 ***	0.287 ***
Time	0.060 ***	0.060 ***	-0.038	-0.032	-0.032
OWNER FINANCE					
Own funds		-0.023	-0.092 **	-0.087 **	-0.089 ***
Funds from family and friends		-0.082 *	-0.130 *	-0.083 *	-0.086 *
Personal bank loan		0.052	-0.040	0.059	
Own funds x time			0.035 ***	0.033 ***	0.334 ***
Funds from family and friends x time			0.024		
Personal bank loan x time			0.054		
JOINT UTILIZATION					
Joint premises		0.202 **	0.219 *	0.201 **	0.180 **
Cooperation for purchase		0.040	0.073	0.043	
Cooperation for sales		0.049	-0.052	-0.046	
Joint premises x time			-0.007		
Cooperation for purchase x time			-0.015		
Cooperation for sales x time			0.000		
DELAYING PAYMENTS					
Leasing		0.232	-0.284	0.229	
Days purchases outstanding		-0.001	-0.001	-0.001	
Delay payment of taxes		0.448	1.195	0.442	
Leasing x time			0.260		
Days purchases outstanding x time			0.000		
Delay payment of taxes x time			-0.378		
MINIMIZING INVESTMENT					
Inventory		-0.281	-0.001 *	-0.271	
Interims		0.032 **	0.021	0.020	0.024
Students		0.019	0.017	0.019	
Interns		0.005	0.029	0.006	
Inventory x time			-0.153		
Interims x time			0.005 *	0.006 **	0.006 **
Students x time			0.001		
Interns x time			-0.012		
MINIMIZING ACCOUNTS RECEIVABLE					
Days of sales outstanding		0.000	0.004	0.003	0.003
Days of sales outstanding x time			-0.002 **	-0.002 **	-0.002 **
SUBSIDY FINANCE					
Subsidies		-0.059 *	-0.113 **	-0.113 **	-0.117 **
Subsidies x Time			0.028 **	0.027 *	0.027 *

Number of observations = 978; number of ventures = 214. Industry controls are included but not reported. We refrain from providing goodness-of-fit tests for the GEE models as there are still no universally accepted tests (Ballinger, 2004).

[*] $p < .10$

[**] $p < .05$

[***] $p < .01$