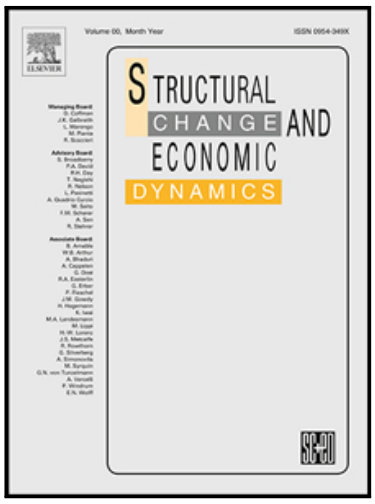

Does Venture Capital affect capital structure rebalancing? The case of small knowledge-intensive service firms

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Highlights

- Examines the small knowledge-intensive service (SKIS) firms' capital structure rebalancing, before and after Venture Capital (VC) investment.
- It uses the system GMM (1998) estimator proposed by Blundell and Bond (1998) to capture the dynamic financing behavior of the SKIS firms.
- In line with several studies on dynamic trade-off theory (TOT), the target debt ratio was endogeneized to estimate the speed of adjustment.
- The results suggest that SKIS firms, after VC funding, are closer to an extended version of the pecking order theory than before VC funding.
- The results suggest that SKIS firms, after VC funding, avoid relying on debt, probably due to their high exposition to risk resultant from these firms' specificities, namely the strong investment in educational background and soft skills of their human resources.

Does Venture Capital affect capital structure rebalancing? The case of small knowledge-intensive service firms

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ABSTRACT

This study analyses small knowledge-intensive service (SKIS) firms' capital structure rebalancing, before and after Venture Capital (VC) entry. We use data for a sample of 1161 Western European SKIS firms, for the period 2006-2015. Two sub-samples were created: one composed of firms before VC entry; the other composed of SKIS firms after VC treatment. We use panel data models and the system GMM (1998) dynamic estimator. The results obtained suggest that after VC entry, SKIS firms are close to the predictions of the pecking order theory. Therefore, SKIS firms after VC participation on firm equity, probably become less dependent on debt, choosing internal finance to fund assets that are firm-specific or have an intangible nature, and, hence cannot be pledged as collaterals.

Keywords: Capital Structure Rebalancing; Small Knowledge-Intensive Service Firms; Venture Capital; Europe.

JEL Classification Codes: G32; G33; L26.

INTRODUCTION

Venture capital investors (VCs) have an important role in the business sector, particularly in firms´ revitalization, contributing to wealth creation in various countries' economies. According to the Invest Europe report (2017), since 2007 European VCs have backed more than 21,000 firms[2], including innovative start-ups in growth, medium-sized firms seeking to develop, and firms with revitalization needs.

VCs are financial intermediaries with distinct characteristics from the traditional finance sources (e.g. banks) which are interested in innovative business ideas, with high potential growth and risk. The impact of the 2008 financial crisis, on reducing the funding by the European banking sector brought an increase of VC investment in Europe. According to the Invest Europe report (2017), venture capital (VC) investment in Central and Eastern Europe, in the year 2015, reached, the maximum value since 2009. The total amount of this investment increased by 25% per year to around €1.6 billion, involving a record number of investee firms in 2015.

VCs are investors that not only contribute to financial resources but also assist in investee firms' planning, management, and strategic decision-making processes, thus being active investors and adding value. Various authors (Bergemann and Hege, 1998; Casamatta and Haritchabalet, 2004; Félix, Esperança, Gulamhussen and Pires, 2009; Gompers, 1995; Lerner, 1994; Nahata, 2009; Sahlman, 1990; Wang and Zhou, 2004) pointed out that VCs certify the quality of the investee firms for the market, which may reduce the problems of information asymmetry and agency. After VC entry, investee firms acquire greater reputation that allows them to obtain credit on more favorable terms (Capizzi, Giovannini, and Pesic, 2011).

Schricke *et al.* (2012) and Strambach (2001) argued that small and medium-sized knowledge-intensive services (SKIS) firms have specificities[3], which are intrinsically related to the informational and intangible nature of their service products (Hottenrott, Lins and Lutz, 2018), making these firms more likely to face information asymmetry and agency problems. In the absence of collaterals and a track record, this type of firm is greatly exposed to the consequences of capital market imperfections (Amit et al., 1998). It is expected that those firms face restrictions in obtaining external finance, namely debt at favorable terms (Scandizzo, 2005; Hottenrott et al., 2018).

The literature suggests that firms' characteristics, such as financial restrictions, firm size, profitability, growth, and age influence the firm target debt ratio. The target debt ratio represents the level of debt that allows the firm to manage the default risk, bankruptcy costs and debt tax shields. Firms can move away from their target debt ratio, but the adjustment toward target capital structure is desirable, given that a deviation can penalize the firm regarding debt tax shields or bankruptcy costs. The distance from the target capital structure may have negative effects associated with an unbalanced capital structure, such as investors' penalizations due to the default risk associated with over-leverage or the loss of debt tax shields due to under-leverage.

Balboa, Martí and Tresierra-Tanaka (2017) report that the literature has been exploring the supply-side of venture capital (VC), focusing on its role in investee firms (Sahlman, 1990; Reid, Terry and Smith, 1997; Amit, Brander and Zott, 1998; Engel, 2002; Bessler and Kurth, 2007; Engel and Keilbach, 2007; Bertoni, Colombo and Croce, 2010; Bertoni et al., 2013), as well as the demand-side of VC, analyzing the characteristics that make firms attractive for VC

2 With an amount of more than $271 billion.

[3](1) great importance of human capital; (2) activities based on intensive know-how; (3) production and consumption is simultaneous; (4) intangible nature of service innovation; (5) customers are co-producers of service innovation; and (6) difficulty in standardizing services.

investment (Tyebjee and Bruno, 1984; MacMillan, Siegel and Narasimha, 1985; MacMillan, Zemann and Subbanarasimha, 1987; Hall and Hofer, 1993; Fried and Hisrich, 1994; Muzyka, Birley and Leleux, 1996; Zacharakis and Meyer, 1998; Nunes, Félix and Pires, 2014). However, little is known about the dynamic rebalancing of firms' capital structure before and after VC entry (Balboa et al, 2017).

Considering this gap in the literature, the present study seeks to analyze the effect of VC funding on the dynamic behavior of firms' capital structure, i.e. before and after VC investment. Particularly, this study will analyze the dynamic process of capital structure rebalancing in SKIS firms before and after VC funding.

According to Strambach (2001), the knowledge-intensive service industry is one of the most dynamic components of the service sector in Europe (as well as in most highly industrialized countries), mainly due to the major changes in production and organizational structures, and the growing linkages and networks between economic activities. As stated by Schricke, Zenker, and Stahlecker (2012), SKIS firms have contributed to increasing employment in Europe, mainly due to the rise in the demand for their services. In pursuing the objective of this study, we consider a sample of 1161 SKIS firms in Western European countries. Data were obtained from the Amadeus database of Bureau van Dijk, for the period between 2006 and 2015. Two research sub-samples were created: one composed of SKIS firms before receiving VC funding, corresponding to data for the period between 2006 and 2009; the other composed of SKIS firms after VC funding, which began in 2010. Therefore, this second sub-sample includes SKIS firms with VC treatment and corresponds to data for the period between 2010 and 2015.

We use panel data models, namely using the system GMM (1998) estimator proposed by Blundell and Bond (1998), in order to capture the dynamic financing behavior of SKIS firms regarding the adjustment toward target debt.

This study presents various contributions to the literature on capital structure rebalancing for small firms in general and for SKIS firms in particular. First, the results obtained indicate that SKIS firms, after VC entry, seem less dependent on debt, suggesting that they rely on internal finance to fund investment opportunities, namely investment in intangible assets. Therefore, SKIS firms, after VC entry, follow the predictions of the pecking order theory (Baeyens and Manigart, 2006).

Second, the results show that SKIS firms, after VC entry, deviating from the target debt ratio, reduce the speed of adjustment, suggesting that these firms bear high adjustment costs. However, financial flexibility contributes to VC-backed firms to adjust faster toward target debt ratio. Thereby, VC-backed firms use internal finance, instead of external capital market transactions to rebalance their capital structure.

Third, overall, the results suggest that, despite the lower level of asymmetric information, which is expected due to VC entry, investee SKIS firms avoid debt, probably due to their high risk associated with their specificities. These firms seem to prefer internal finance to fund their investment opportunities, namely the investment in their human resources' education and soft skills.

The remainder of this paper is structured as follows. Section 2 provides the theoretical framework. Section 3 presents the methodology. The results and discussion of empirical findings are presented in Section 4. Finally, Section 5 presents the final considerations.

THEORETICAL FRAMEWORK

In accordance with the static trade-off theory, there is an optimal debt ratio that results from the balancing between the benefits of debt (such as debt tax shields) and the bankruptcy costs (such as bankruptcy and agency costs) (Jensen and Meckling, 1976; Kraus and Litzenberger, 1973; Myers, 1984). Additionally, considering the dynamic financing behavior of firms, the predictions of the dynamic trade-off theory point out the existence of a target debt ratio that is the level of debt at which the firm can manage the default risk, bankruptcy costs and debt tax shields (Strebulaev, 2007). Firms can move away from their target debt ratio, but adjustments toward target debt ratio are required, because the deviation can penalize the firm regarding the potential debt tax-shields or bankruptcy costs. Given that firms operate over many periods, the dynamic version of TOT proposes a dynamic adjustment process of a firm's debt toward target debt ratio. The speed of adjustment toward target debt ratio is determined by the adjustment costs and deviation costs. If the adjustments costs, (i.e. transactions costs like legal fees and investment bank fees) are higher than the deviation costs (i.e. financial distress costs), then most of the adjustments occur based on the internal finance without external capital market transactions (Drobetz & Wanzenried, 2006).

The financial crisis of 2008-2009 highlighted the weaknesses of small and medium-sized enterprises (SMEs) regarding their dependence on bank credit. That crisis forced banks to restructure their balance sheets, meaning less credit for firms with a greater risk of default. Restrictions on credit to SMEs were introduced, so that they would restructure their liabilities and become less dependent on bank debt (OECD, 2012). Consequently, there was a need to strengthen the alternatives to bank debt so that SMEs could continue to grow and create wealth with positive consequences for the economy. While bank debt remains crucial for SMEs, more diversified finance sources can fund investment opportunities and reduce the vulnerability of these firms to changes in the credit market (OECD, 2010; 2012).

The informational and intangible nature of SKIS firms´ services contributes to the problems of information asymmetry between firm owners/managers and creditors. Moreover, the lack of collaterals may imply unfavorable terms in accessing credit (Cressy and Olofsson, 1997; Cruz-Ros, Cruz and Pérez-Cabañero, 2010; Panda, 2015). SKIS firms are riskier and face greater difficulties in obtaining credit, which decreases the possibility of taking advantage of growth opportunities when internal funds are insufficient (Gompers, 1995; Michaelas, Chittenden and Poutziouris, 1999; Serrasqueiro, Armada and Nunes, 2011). Thus, the hypothesis of internal finance is acceptable, implying that capital market imperfections and agency costs arising from asymmetric information will make internal finance the main determinant of SKIS firms' investment (Scandizzo, 2005).

VCs are financial intermediaries with special skills, namely in the area of management, which may contribute to SKIS firms' success. VCs enhance the firm´s reputation in creditors' eyes, and by participating in the firm´s equity, they provide financial resources to VC-backed firms to take advantage of investment opportunities and give a sign of quality and reputation, certifying the quality and the potential growth of the firm to the market (Ang, 1991; Bertoni *et al.*, 2013; Chittenden, Hall, and Hutchinson, 1996; Nahata, 2009). Signaling can resolve information asymmetry and help to mitigate the problems of adverse selection and moral hazard, consequently allowing firms more favorable terms of credit (Admati and Pfleiderer, 1994; Gompers, 1995; Bergemann and Hege, 1998; Berger and Udell, 1998).

VCs inject equity in promising firms with excellent growth opportunities (Balboa *et al.*, 2017), this being an advantage for financially restrained firms with few sources of external

finance, namely depending on bank debt, which often requires the existence of collaterals (Bertoni *et al.*, 2013; Boucly *et al.*, 2011; Denis, 2004; Engel and Stiebale, 2014).

According to various authors (De Miguel and Pindado, 2001; Lopez-Gracia and Sogorb-Mira, 2008; Ozkan, 2001; Serrasqueiro and Nunes, 2012; Shyam-Sunder and Myers, 1999), target capital structure depends on the firm's specific characteristics, which are relevant determinants of debt. The target debt ratio is a level of debt that allows the firm to manage the risk of default and bankruptcy costs, as well as debt tax shields. Firms can move away from their target debt ratio, but this deviation can penalize them regarding debt tax shields and bankruptcy costs. Indeed, remaining far from target capital structure may have negative effects on a firm´s value. An unbalanced capital structure can be penalized by investors due to the risk of default associated with over-leverage or to the loss of debt tax shields associated with under-leverage.

Several studies show that small firms adjust toward target capital structure, presenting a lower speed of adjustment due to high adjustment costs faced by these firms (López-Gracia and Sánchez-Andújar, 2007; López-Gracia and Sogorb-Mira, 2008; Sardo and Serrasqueiro, 2017).

Based on the above, we can conclude that VC funding, increasing equity and impacting positively on the reputation of the investee SKIS firms, can contribute to lower costs of adjustment toward target debt ratio, thus increasing the speed of adjustment toward target capital structure. Balboa *et al.* (2017) analyzed the speed of debt adjustment in a sample of unlisted Spanish firms that received VC investment, which was compared with a control group of firms that did not receive equity funding through VC. Those authors concluded that recipient firms adjusted more slowly toward their target debt ratio than the control group firms. The authors concluded that VC-backed firms were more concerned about funding their investment opportunities than rebalancing their capital structure. Balboa et al. (2017) conclude that VC-backed firms are more financially restrained than non-VC-backed firms, and so the former are less able to adjust toward target capital structure.

The current study seeks to analyze the effect of VC funding on adjustment toward target capital structure in SKIS firms in the sectors of information and communication and professional, scientific and technical activities. Thus, we seek to analyze the rebalancing of SKIS firms' capital structure before and after the VC entry.

METHODOLOGY

Database and Variables

The data used in this study were collected from the Amadeus database, from Bureau van Dijk, for firms in Western European countries, from 2006 to 2015.

For sample selection purposes, we took into consideration three criteria: (1) definition of SMEs according to the European Commission (Recommendation 2003/36/CE)[4]; (2) the Eurostat definition of knowledge-intensive services[5] (KIS), which aggregates services based on NACE Rev. 2; and, (3) selection of unlisted firms, in which the list of shareholders contains venture capital or private equity firms. Also, seeking the refinement of the sample: the firms with less than three consecutive years of observations, before and after initial VC entry, were eliminated. Following Guariglia (2008), in order to mitigate potential survivor bias, the entry

[4]Considered a small firm when: i) employing fewer than 50 people; and ii) turnover or annual balance sheet total does not exceed € 10 million. According to the European Commission's recommendation, a firm is considered medium-sized when at least two of the following criteria are met: i) having between 50 and 250 employees; ii) total assets between € 10 million and € 43 million; and iii) turnover between € 10 million and € 50 million.

[5]http://ec.europa.eu/eurostat/cache/metadata/Annexes/htec_esms_an3.pdf

and exit of firms were allowed and observations at one percent tails were excluded to control the potential effects of outliers, which may derive from particular events such as large mergers or errors in coding. Therefore, 2% of observations were excluded from the initial sample of 1184 SKIS firms. Once 23 firms/outliers were removed, the final sample contains 1161 SKIS firms.

Based on these criteria, our final sample is an unbalanced panel, consisting of 1161 firms belonging to sectors J. - Information and communication (NACE Code 62) and M. - Professional, scientific and technical activities (NACE code 72).

To achieve the purpose of this study, two sub-samples were created: one composed of SKIS firms before receiving VC funding, corresponding to data for the period between 2006 and 2009; the other composed of SKIS firms with VC funding, beginning in 2010, this second sub-sample contains SKIS firms after VC treatment and corresponding to the period between 2010 and 2015.

The proxies of the determinants of capital structure, as well as of the speed of adjustment selected for this study are based on the empirical literature and are listed in Table 1.

< Insert Table 1 Here >

Harris and Raviv (1991) stated there was consensus regarding the determinants of firms' capital structure. These authors identify the following determinants: tangible assets; size-probability of default; profitability; volatility; growth opportunities; tax effects; marketing expenditure; research and development expenditure; and uniqueness. Aybar-Arias et al. (2012) analyzed the SMEs' speed of adjustment toward target debt ratio, through the endogeneization of the target and speed of adjustment for Spanish SMEs, using the system GMM (1998) dynamic estimator. Regarding the variables and econometric method used, our study will closely follow the study of Aybar-Arias et al. (2012).

Estimation Methods

In order to analyze the dynamic behavior of SKIS firms´ capital structure and to verify the predictions of TOT, we used a partial target adjustment model as in Aybar-Arias et al. (2012), Banerjee, Heshmati and Wihlborg (2004), De Miguel and Pindado (2001), Flannery and Rangan (2006), and Lopez-Gracia and Sogorb-Mira (2008):

$$Debt_{i,t} - Debt_{i,t-1} = \lambda_{i,t}\left(Debt^{*}_{i,t} - Debt_{i,t-1}\right) \qquad (1)$$

Where: $Debt_{i,t}$ is the debt of firm *i* in the year *t*; $Debt_{i,t-1}$ is the debt of firm *i* in the previous period; $\lambda_{i,t}$ is the speed of adjustment of actual level of debt toward target debt ratio.

Regrouping the terms of equation (1), the actual level of debt is determined by:

$$Debt_{i,t} = \left(1 - \lambda_{i,t}\right)Debt_{i,t-1} + \lambda_{i,t}Debt^{*}_{i,t} \qquad (2)$$

If firms do not adjust their debt toward target debt level, i.e., $\lambda_{i,t} = 0$, then debt in the current period equals debt in the previous period, i.e., $Debt_{i,t} = Debt_{i,t-1}$. In the case of total adjustment of debt, i.e., $\lambda_{i,t} = 1$, then debt equals the respective optimal level, i.e., $Debt_{i,t} = Debt^{*}_{i,t}$. If firms follow an adjustment process to reach their target debt level, the coefficient $\lambda_{i,t}$ should have a value between 0 and 1.

In line with other studies (Aybar-Arias *et al.*, 2012; De Miguel and Pindado, 2001; Lopez-Gracia and Sogorb-Mira, 2008; Shyam-Sunder and Myers, 1999), target debt ratio is determined by the firms' specific determinants, which it is represented by the following equation:

$$Debt_{i,t}^{*} = \beta_0 + \sum_{J=1}^{n} \beta_J X_{J,i,t} + d_t + \mu_t + \varepsilon_{i,t} \qquad (3)$$

where $X_{J,i,t}$is the vector of the leverage determinants *J* considered in this study (*Risk*; *GO*; *Profit*; *Tang*; *Size*; *Age*; *Uniqueness*); d_t represent the time dummy variables, which intend to capture possible business cycle effects; μ_i are non-observable individual effects; $\varepsilon_{i,t}$ is the error term.

Considering that the coefficient of the adjustment speed of firm *i* in year *t* is given by $\lambda_{i,t} = \varphi_0 + \sum_{k=1}^{m} \varphi_k Z_{k,i,t}$, where $Z_{k,i,t}$, we substitute this expression in equation (2), and therefore, the model of the adjustment of debt toward target debt ratio is as presented in equation (4):

$$\begin{aligned} Debt_{i,t} = {} & \beta_0\varphi_0 + (1-\varphi_0)Debt_{i,t-1} + \varphi_0 \sum_{J=1}^{n} \beta_J X_{J,i,t} \\ & + \beta_0 \sum_{k=1}^{m} \varphi_k Z_{k,i,t} - \sum_{k=1}^{m} \varphi_k Z_{k,i,t}\, Debt_{i,t-1} \\ & + \sum_{J=1}^{n}\sum_{k=1}^{m} \beta_J \varphi_k X_{J,i,t} Z_{k,i,t} + d_t + \mu_i + \varepsilon_{i,t} \end{aligned} \qquad (4)$$

The literature identifies three strategies to estimate the target debt ratio: (1) based on the average debt ratio of the sample for each period in analysis; (2) based on the average debt of industry sectors; and (3) by endogenizing the target debt ratio and the speed of adjustment in the adjustment model (e.g., Aybar-Arias *et al.*, 2012; Banerjee et al, 2004; Chipeta and Mbululu, 2013; Drobetz, Pensa, and Wanzenried, 2006; Lemma and Negash, 2014; Lööf, 2004). In the present study, we follow the strategy (3), which consists of endogenizing the target debt ratio and the speed of adjustment.

Seeking to get a deeper understanding of the speed of adjustment, and following the study by Aybar-Arias *et al.* (2012), we will analyze the following determinants of the speed of adjustment: size, growth, financial flexibility and distance.

In order to calculate the distance between the firm's target debt ratio and current debt ratio, i.e., distance = $|Debt_{i,t}^{*} - Debt_{i,t}|$, first we estimate the optimal debt ratio, i.e. $Debt_{i,t}^{*}$, using the fixed-effects panel data model, in which the dependent variable, i.e., $Debt_{i,t}$, is regressed with the determinants of capital structure used in this study, through the following equation:

$$Debt_{i,t} = \beta_0 + \sum_{J=1}^{n} \beta_J X_{J,i,t} + d_t + \mu_i + \varepsilon_{i,t} \quad (5)$$

where: $X_{k,i,t}$ is the vector of the *J* leverage determinants referred to in equation (3); *i* represents each firm; *t* represents time; d_t represents time dummy variables, which intends to capture possible business cycle effects; μ_i are non-observable individual effects; and $\varepsilon_{i,t}$ is the error term.

The model of the adjustment of debt toward target debt ratio is estimated resorting to dynamic panel data, which allows to consider the heterogeneity of the adjustment process among different types of firms over time. Therefore, we will use the system GMM (1998), the dynamic estimator proposed by Blundell and Bond (1998), which mitigates the problem of endogeneity and contributes to avoiding significant bias in the estimates (Wooldridge, 2007). This efficient estimator also allows control of correlation errors over time and heteroscedasticity across firms.

The estimates of the GMM system (1998) estimator are only valid on the following conditions: (1) validity of the restrictions created by the use of instruments; and (2) there should be no second-order autocorrelation. The Hansen test is used to verify the first condition, i.e., the validity of the restrictions created by the instruments used. For the second condition, we tested for second-order autocorrelation, where the null hypothesis indicates there is none. In the case of not rejecting the null hypothesis for the Hansen and second-order autocorrelation tests, we conclude that the system GMM (1998) estimator is valid and robust.

The system GMM (1998) estimator has brought significant improvements in efficiency compared with the first GMM (1991) estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). To difference overcome the reliability problem of the one-step estimator GMM[6] (identified by Arellano and Bond, 1991; Windmeijer, 2005; and Roodman,2006), Windmeijer (2005) developed the corrector for small samples, which allows a more accurate inference in the two-step procedure (Roodman, 2009).

When observing the persistence of the dependent variable, Blundell and Bond (1998) suggest the use of the system GMM (1998) dynamic estimator to mitigate bias in the estimated results. We found high persistence between debt in the current period and debt in the previous period in both samples[7], and so we will use the system GMM (1998) estimator. In addition, we did not reject the null hypothesis of the Hansen and second-order correlation tests, so the results of the system GMM (1998) estimator are open to interpretation.

RESULTS

Descriptive statistics

To test whether there are significant differences between SKIS firms before and after VC entry, we performed the T-test (see Table 2).

< Insert Table 2 Here >

The results show significant differences between the two sub-samples, i.e., SKIS firms after VC funding and SKIS firms before VC funding, for all variables, with the exception of size. These

[6] Asymptotically more efficient than the two-step estimator due to the downward biased standard errors.

[7] The results of the correlation matrix show that for the sub-sample of SKIS firms *before VC funding*, the correlation between $Debt_{i,t}$ and $Debt_{i,t-1}$ is statistically significant (p<0.01) with a magnitude of 0.7657, whereas for the sub-sample of SKIS firms *after VC funding*, the correlation between $Debt_{i,t}$ and $Debt_{i,t-1}$ is statistically significant (p<0.01) with a magnitude of 0.6596.

results show that the differences between the firms about the financing behavior are explained by factors other than size. Balboa et al. (2017) obtained a similar result for the size variable. Berger and Udell (1998), in their study of the roles of private equity and debt in the financial growth cycle, showed that the finance sources and capital structure decisions of small firms and varies with firm size and age.

The descriptive statistics of the dependent and explanatory variables are presented in Table 3.

< Insert Table 3 Here >

We find that SKIS firms, after receiving VC funding, on average, present a lower debt ratio than before the VC entry. SKIS firms, before VC entry, rely more on debt, which may be possible to the high level of collaterals (i.e. tangible assets), as well as to the lower level of business risk that may contribute to this. We also find that SKIS firms, after VC entry, on average, present: (i) lower profitability; and (ii) similar size, when compared to SKIS firms before VC entry.

The greater level of the business risk of SKIS firms, after VC funding, can be a consequence of the greater level of uniqueness that these firms generally present. These results are in line with the VC value-added literature, which reports that VCs help their portfolio firms to take advantage of growth opportunities by building teams of highly-qualified and experienced human resources, which is captured by the uniqueness variable in this study. Growth opportunities are, on average, higher for SKIS firms after VC entry, suggesting that after receiving VC funds, these firms take advantage of investment opportunities. This result corroborates the study of Balboa, Martí, and Tresierra-Tanaka (2012) on Spanish VC-backed firms. Additionally, VCs seek to contribute to increasing the growth of their portfolio firms, so that these firms can achieve the levels of profitability compatible with VCs' successful exit from investee firms. Regarding the lower average profitability verified by SKIS firms after VC funding, this can be explained by higher investment in qualified human resources (measured here by the uniqueness variable) as well as in growth opportunities, which take longer to generate returns.

Determinants of Capital Structure and Speed of Adjustment

The optimal debt ratio is obtained through a fixed-effects panel data model, and the results are shown in Table 4. The estimations obtained, using the fixed effects model, allow the calculation of the distance between target debt and current debt, i. e. $|Debt^{*}_{i,t} - Debt_{i,t}|$, which is introduced into equation (5).

< Insert Table 4 Here >

The results indicate that for SKIS firms, after VC funding, the determinants with a statistically significant impact on debt are: i) tangibility and age with a positive impact; and ii) profitability and uniqueness with a negative impact on the optimal debt ratio. In the sample of SKIS firms before VC, the determinants with a statistically significant impact on debt are: i) growth opportunities, tangibility, and size with a positive impact, while ii) business risk, profitability, age, and uniqueness have a negative impact on the optimal debt ratio.

The estimations obtained from the GMM system (1998) estimator referring to the determinants of debt and target debt ratio for SKIS firms, before and after VC entry, are presented in Table 5[8].

< Insert Table 5 Here >

Overall, the results are close to those obtained with the fixed effects model and presented in the Table 4.

Regarding the results for the determinants of capital structure of SKIS firms after VC investment: i) debt in the previous period, tangibility and age have a positive and significant impact on debt; while ii) growth opportunities, profitability, and uniqueness have a negative and significant impact on debt. For the sample of SKIS firms before VC investment, our results show that: i) debt in the previous period, tangibility, size, and age have a positive and significant effect on debt; while ii) business risk, profitability, and uniqueness have a negative and significant effect on the ratio debt. These results are in line with previous studies on SME capital structure (Degryse, de Goeij and Kappert, 2012; Hall, Hutchinson and Michaelas, 2004; Michaelas et al. 1999; Serrasqueiro, 2011; Serrasqueiro et al., 2011; Sogorb-Mira, 2005).

The results obtained from the estimates of equation (4) (Table 5) indicate that for SKIS, after VC funding, the adjustment speed is 0.681 (i.e. $(1-\varphi_0)$, where $\varphi_0 = 0.31866$). For SKIS firms before VC funding, the results show a lower adjustment speed of 0.487.

Determinants of Speed of Adjustment

The determinants of the speed of adjustment are analyzed considering certain firm characteristics that may influence the speed of adjustment toward target debt ratio. This study follows that of Aybar-Arias et al. (2012), which considered as determinants of the speed of adjustment: size, distance, growth, and financial flexibility. The impact of these determinants is analyzed on the basis of the interaction terms (Table 5) of the speed of adjustment determinants and the lagged debt, i.e., $Z_{k,i,t}Debt_{i,t-1}$ on the current debt ratio.[9] Furthermore, interpretation of the impact of these determinants should be multiplied by the minus signal (see equation 4), in order to interpret the effects of the determinants on the speed of adjustment. The results indicate that the determinants influence the speed of adjustment in SKIS firms before and after VC funding. The results obtained for SKIS firms after VC treatment show that: i) size and financial flexibility have a positive and significant impact on the speed of adjustment; ii) while distance has a negative and significant impact on the speed of adjustment. For SKIS firms before VC treatment, the results show that: i) size has a positive and significant impact on the speed of adjustment; ii) while, distance has a negative and significant impact on the speed of adjustment. These results corroborate the results of Aybar-Arias et al. (2012) obtained for unlisted Spanish SMEs.

Discussion of the Results

Determinants of Capital Structure and Speed of Adjustment

In the case of SKIS firms, before VC treatment, the positive and significant impact of size on debt suggests that greater firm size is associated with a lower risk of default and bankruptcy, thereby allowing a greater capacity of debt, and negotiating credit on more favorable terms.

[8] The estimations obtained from GMM system (1998) estimator referring to all the determinants of debt as well as the target debt ratio for *SKIS firms before and after VC investment* are presented in Table A.1 in Appendix.

[9] The interaction terms are: $Debt_{i,t-1}$ * growth-speed; $Debt_{i,t-1}$ * size-speed; $Debt_{i,t-1}$ * distance-speed; $Debt_{i,t-1}$ * flexibility-speed (Table 5).

The positive impact of asset tangibility on debt for SKIS firms before and after VC treatment, suggests that a higher level of asset tangibility means greater capacity to provide collaterals to creditors, which may allow more favorable credit terms, and consequently, a greater possibility for those firms to borrow funds (Cressy and Olofsson, 1997; Cruz-Ros et al, 2010; Panda, 2015). In spite of a reduction of the problems of adverse selection and moral hazard with creditors due to the presence of VC in the SKIS firms' equity, it seems that investee SKIS firms need to provide collaterals for obtaining credit.

Profitability has a negative impact on the debt of SKIS firms before and after VC funding, indicating that, regardless of receiving VC funding, those firms prefer to rely on internal finance to fund their current activities and growth, resorting to debt when internal funds are exhausted, corroborating various studies (Balboa, Martí-Pellón and Tresierra-Tanaka, 2011; Chittenden et al. 1996; Michaelas et al. 1999; Serrasqueiro, 2011; Serrasqueiro et al., 2011; Sogorb-Mira, 2005). The negative impact of profitability on debt is of greater relative magnitude in SKIS firms before VC treatment, suggesting that the SKIS firms are more dependent on retained earnings before VC funding.

The results show that after VC funding, SKIS firms rely less on debt and that growth opportunities and uniqueness impact negatively on these firms´ debt. Therefore, the results obtained here suggest that after VC funding, SKIS firms avoid to rely on debt for funding their investment opportunities. This corroborates the argument of Baeyens and Manigart (2006) that equity investors, such as VCs, may be willing to provide equity to investee firms facing a high level of risk, in order to avoid the financial risk associated with leverage.

Business risk has a negative effect on the debt of SKIS firms, before VC investment, suggesting that these firms, facing a higher level of risk, reduce their level of debt.

Uniqueness has a negative impact on debt in SKIS firms before and after VC treatment. In the event of bankruptcy, a greater level of firm uniqueness, measured by the costs of firm employees, implies difficulties in the liquidation of firms' assets for their real value (Aybar-Arias et al. 2012). Therefore, firms' level of uniqueness seems to imply a lower level of debt in SKIS firms. Moreover, the level of education and soft skills of owners/managers and employees are determinants of the SKIS firms´ success (Hottenrott et al., 2018). However, banks find it very hard and expensive to assess these capacities, deteriorating the terms of credit offered to SKIS firms (Hottenrott et al., 2018).

The results suggest that after VC investment, SKIS firms adjust their debt toward target debt ratio faster than before VC funding. VCs provide funds, participating in the firm´s equity, which can also be used to rebalance its capital structure (Balboa et al., 2017).

Briefly, the results of this study show that SKIS firms, after VC funding, with a greater growth opportunity rely less on debt, suggesting that these firms prefer internal finance to fund their growth opportunities. In fact, with greater level of financial resources after VC funding, SKIS firms seem to rely less on debt to fund growth opportunities, since this type of investments is associated with intangible assets and represents a greater risk for creditors. Therefore, SKIS prefer internal finance to fund this type of investment. This result suggests that SKIS firms follow the predictions of the pecking order theory. Even after VC funding, which can lessen problems of asymmetric information, SKIS firms prefer not to rely on debt to fund assets that are firm-specific or intangible and hence cannot be used as collaterals. Additionally, the results show that before and after VC treatment, SKIS firms rebalance their capital structure. However, after VC funding, SKIS firms adjust faster their debt ratio toward target debt ratio, suggesting that their adjustment costs are lower than those faced before VC funding. Balboa et al. (2017) find that VC-backed firms present a lower speed of adjustment

toward target debt ratio, concluding that these firms choose to rely on internal finance to fund investment opportunities instead of rebalancing their capital structure. In the current study, the results suggest that after VC funding, SKIS firms take advantage of investment opportunities, which does not prevent the adjustment toward target debt ratio, probably seeking to conciliate the funding of investment opportunities with the rebalancing of capital structure.

Determinants of the Speed of Adjustment

Regarding the determinants of the speed of adjustment, the firm's size has a positive impact on the speed of adjustment toward target debt ratio in SKIS firms before and after VC funding. Nevertheless, the impact of size is of a greater relative magnitude in SKIS firms before the VC investment. Probably, for these firms, a greater firm size reduces the adjustment costs and thus contributes to a higher speed of adjustment. However, firm size loses importance for the speed of adjustment toward target ratio after VC funding. The injection of equity from VCs reduces the importance of firm size in thee rebalancing of these firms' capital structure. Banerjee et al. (2004) and Aybar-Arias et al. (2012) found a positive and significant impact of firm size on the speed of adjustment toward target debt ratio.

The results obtained suggest that the distance, considered as a determinant of the speed of adjustment, has a negative impact on the speed of adjustment for SKIS firms before and after VC investment. This negative impact of distance suggests that the greater is the distance of the current debt from the target ratio, the lower is the speed of adjustment. Therefore, before and after VC funding, SKIS firms that are far from their respective target debt ratios present lower speeds of adjustment toward these ratios. Consequently, the adjustment costs seem to be greater than the costs of deviation from the target debt ratio for those firms.

Nevertheless, distance has a negative impact, with greater relative magnitude, on the speed of adjustment after VC funding than before VC funding. This suggests that adjustment costs are greater than deviation costs for SKIS firms which, after VC treatment, are far from their target debt ratio. Therefore, after VC funding and deviating from the target debt ratio, SKIS firms seem to prioritize the funding of their investment opportunities instead of rebalancing of their capital structure. Probably, these firms avoid adjustment costs, i.e., the costs of external capital market transactions. Moreover, given that these firms, after VC entry, may present a lower risk of default, and consequently, lower costs of deviation, they can remain far from target debt ratio for a longer time, without being penalized by creditors.

After VC entry, SKIS firms show a lower speed of adjustment when their current debt is far from the target level, probably because adjustments are dependent on the availability of internal financial resources or the adjustments of dividend distribution policy (Aybar-Arias et al., 2012). After VC funding, SKIS firms deviating from the target debt ratio seem to prioritize the financing of investment opportunities over the rebalancing of capital structure.

The results of this study, concerning the negative impact of distance on the speed of adjustment, are identical to those obtained by Aybar-Arias et al. (2012) for Spanish SMEs. In turn, Heshmati (2001) found a positive impact of distance on the speed of adjustment of total debt in Swedish micro and small firms. Drobetz et al. (2006) identified a positive impact of distance on the speed of adjustment of total debt in German, French, Italian and British firms, while Lööf (2004) found a negative impact of distance on the speed of adjustment of debt in large British firms. Then again, Lemma and Negash (2014) identified a negative relationship between distance and the speed of long-term debt adjustment in firms in developing countries in Africa.

SKIS firms, after VC funding and far from target debt ratio, reducing the speed of adjustment, are probably following the suggestion of Aybar-Arias et al. (2012). These authors reported that low levels of adjustment toward target debt ratio depend on the availability of funds obtained by changes in dividend distribution and cash flow policies. This financial behavior seems to be followed after VC entry by the SKIS firms studied here, considering that a high level of financial flexibility contributes to a greater speed of adjustment (financial flexibility shows a positive and significant impact on the speed of adjustment). Thus, SKIS firms, after VC entry and distant from the target debt ratio, face debt adjustment costs and the priority is to make investments instead of performing transactions in the capital market to rebalance their capital structure. The rebalancing of capital structure in VC-backed firms seems to depend on financial flexibility, i.e., on the availability of internal finance, avoiding external capital market transactions. This same positive relationship between financial flexibility and speed of adjustment was also verified by Aybar-Arias et al. (2012) and Kim, Heshmati and Aoun (2006).

In turn, the results of this study indicate that before VC funding and far from target debt ratio, SKIS firms present a higher speed of adjustment toward target debt ratio. This suggests that the costs of deviation associated with an unbalanced capital structure, such as financial distress costs and unfavorable credit terms, are greater than the costs of adjustment for those firms. Therefore, SKIS firms, before VC investment and far from their target debt ratio, seem to rebalance their capital structure faster, in order to avoid potential financial imbalance and allowing the negotiation of credit on more favorable terms.

RATIONAL FINANCIAL BEHAVIOR AND ADJUSTMENT SPEED

Through equation (1), we seek to evaluate if firms behave rationally by reducing the gap between debt levels in year t-1 toward target debt ratio in year t. This adjustment can be done either by increasing debt if $\mathrm{Debt}^{*}_{i,t} - \mathrm{Debt}_{i,t-1} > 0$, i.e., if firms are under-leveraged, or by decreasing debt if $\mathrm{Debt}^{*}_{i,t} - \mathrm{Debt}_{i,t-1} < 0$, i.e., if firms are over-leveraged, where $\mathrm{Debt}^{*}_{i,t}$ is optimal debt in year t and $\mathrm{Debt}_{i,t-1}$ corresponds to the debt observed in year t-1. If firms behave rationally then the speed of adjustment $0 < \lambda < 1$. The remaining firms will present an over-adjustment ($\lambda > 1$) or an irrational adjustment ($\lambda < 1$). To test for rational financial behavior, $\mathrm{Debt}^{*}_{i,t}$ and speed of adjustment, i.e., [10] ,were estimated from our dynamic model (i.e., equation (4)). Table 6 presents the statistics of adjustment speed λ and optimality ratio $\omega_{t-1} = \frac{\mathrm{Debt}^{*}_{i,t}}{\mathrm{Debt}_{i,t-1}}$ and $\omega_{t} = \frac{\mathrm{Debt}^{*}_{i,t}}{\mathrm{Debt}_{i,t}}$ of firms that rationally adjust debt toward target debt levels, either by increasing or decreasing leverage.

< Insert Table 6 Here >

It is found that 87,6%[11] of the sub-sample of SKIS firms before VC treatment rationally adjust their debt toward target debt ratio. As shown in Table 6, the speed of adjustment is similar for both sub-samples, 49% for SKIS firms before VC treatment and 48% for SKIS firms after VC investment. However, for SKIS firms after VC entry, 93%[12] rationally adjust their debt

[10] For VC-backed firms, the coefficient of $Debt_{i,t-1} = 0.3187 = 1 - \lambda$. Solving the equation, $\lambda = 1 - 0.3187 = 0.681$. For the sub-sample before VC, the coefficient of $Debt_{i,t-1} = 0.5128 = 1 - \lambda$. Solving the equation, $\lambda = 1 - 0.5128 = 0.487$.

[11] This percentage is the ratio of observations from the *before VC* sub-sample that rationally adjust, i.e., $0 < \lambda < 1$, to total observations from where λ can be obtained.

[12] This percentage is the ratio of observations from the *VC-backed firms* sub-sample that rationally adjust, i.e., $0 < \lambda < 1$, to total observations from where λ can be obtained.

The results support the capacity of equation (1) to capture the rational financial behavior of most SKIS firms before and after VC investment. SKIS firms seem to be relatively over-leveraged. The number of firms that reduced their debt (over-leveraged firms – 64,5%) is greater than those that increased their debt (under-leveraged firms – 53,5%), especially before VC entry. Therefore, these results suggest that before VC entry, SKIS firms show a higher level of rationality in rebalancing capital structure than after VC entry.

CONCLUSION

This study seeks to analyze the effect of VC funding on the of SKIS firms' capital structure rebalancing. To achieve this objective, we used data from the Amadeus database by Bureau van Dijk for 1161 SKIS firms in Western European countries for the period between 2006 and 2015. Two sub-samples were created: one composed of SKIS firms before the entry of VC; and the other composed of SKIS firms after VC entry (the first round of VC investment occurred in 2010). These firms belong to the industry sectors of information and communication and professional, scientific and technical activities. Dynamic panel data were used, specifically the system GMM (1998) estimator, to capture the dynamic financial behavior of SKIS firms.

The results show that the profitability variable has a negative impact on SKIS firms before and after VC investment, indicating that these firms prefer internal finance to fund their activities and growth opportunities. Also, the negative impact of profitability on debt has a higher relative magnitude in SKIS firms before VC entry than after VC treatment, suggesting that the former are more dependent on internal finance. VC-backed firms with a greater level of growth opportunities rely less on debt. Therefore, after VC funding, SKIS firms seem to rely mainly on internal finance, which is reinforced with VC participation in firms' equity. This result suggests that SKIS firms follow the predictions of the pecking order theory. Therefore, after VC entry, which can reduce problems of asymmetric information, SKIS firms prefer internal finance and they do not rely on debt to fund assets that are firm-specific or intangible and hence cannot be used as collaterals.

The results show that SKIS firms, before and after VC treatment, rebalance their capital structure. It is worth noting that, although after VC funding, SKIS firms presenting high levels of growth opportunities and uniqueness, they do not postpone the rebalancing of their capital structure.

After VC funding, SKIS firms have a higher speed of debt adjustment toward their target debt ratio, suggesting that these firms face lower adjustment costs than before VC funding. Furthermore, regarding the determinants of the speed of adjustment toward target debt, the results obtained suggest that higher firm size, reducing the probability of bankruptcy, contributes to a higher speed of adjustment toward target debt.

Additionally, the speed of adjustment of SKIS firms, before and after VC funding, decreases when the current debt ratio is far from the target ratio. Thus, SKIS firms, before and after VC funding, deviating from the respective target debt ratios, seem to bear high adjustment costs. Nevertheless, the determinant of distance has a greater relative negative impact on the speed of adjustment in SKIS firms, after VC funding, than in SKIS firms, before VC funding. Therefore, SKIS firms, after VC funding and deviating from the target capital structure, face high adjustment costs that imply to avoid external transactions in the capital market, relying on internal finance to make the adjustments needed. Financial flexibility has a positive and significant impact on the speed of adjustment in SKIS firms after VC funding. This suggests that these firms with a higher level of financial flexibility reach their target debt ratio quicker.

The results obtained, regarding the negative impact of uniqueness and business risk on debt, allow us to advise SKIS firms owners/managers to seek alternative finance sources to bank debt, namely VCs funding that participate in the firm equity, providing support to investee firms´ management. For policymakers, we suggest the creation/promotion of alternative finance sources to fund SKIS firms, which are firms with specificities associated with the intangible nature of their investments, and with the level of education and soft skills needed by their owners/managers and employees.

For future research, we suggest analyzing the importance of VC as a source of finance for SKIS firms before and after the financial crisis, as well as in the context of small firms belonging to different industry sectors.

Appendix

Table A.1 - GMM system (1998) - Adjustment Toward Target Debt Ratio

Independent variables	After VC funding	Before VC funding
	Dependent variable: $\text{Debt}_{i,t}$	
$Debt_{i,t-1}$	0.31866**	0.51277***
	(0.14241)	(0.16578)
$\text{Risk}_{i,t}$	-0.06911	-0.39256**
	(0.06170)	(0.16648)
$\text{GO}_{i,t}$	-0.23656**	0.28223
	(0.09994)	(0.17357)
$\text{Profit}_{i,t}$	-0.19230***	-0.23083***
	(0.02489)	(0.03151)
$\text{Tang}_{i,t}$	0.30900***	0.17526**
	(0.07858)	(0.08086)
$\text{Size}_{i,t}$	-0.03584	0.07120**
	(0.01987)	(0.03087)
$\text{Age}_{i,t}$	0.00804***	0.00303*
	(0.00268)	(0.00159)
$\text{Unique}_{i,t}$	-0.00368***	-0.00303*
	(0.00103)	(0.00178)
growth-speed	0.00715	0.07084
	(0.06583)	(0.13117)
size-speed	0.18685**	0.35203***
	(0.09259)	(0.12544)
distance-speed	-0.36047***	-0.32739***
	(0.05468)	(0.08297)
flexibility-speed	-0.30571***	-0.04235
	(0.08661)	(0.07680)
$Debt_{i,t-1}$ * growth-speed	0.01341	-0.24738
	(0.08578)	(0.16946)
$Debt_{i,t-1}$ * size-speed	-0.29266**	-0.31947**
	(0.13437)	(0.15958)
$Debt_{i,t-1}$ * distance-speed	0.74261***	0.63931***
	(0.07910)	(0.12879)
$Debt_{i,t-1}$* flexibility-speed	-0.39253***	0.05206
	(0.14270)	(0.12212)
Time dummies	yes	yes
Constant	0.42425***	0.51317**
	(0.16068)	(0.21691)
Observations	838	1.770
Number of firms	338	575
F (N(0,1))	45.90***	43.26***
Hansen test	108.7	58.39
m1 (N(0,1))	-4.211***	-5.519***
m2 (N(0,1))	-0.175	-1.466

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

CRediT author statement

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Table 1 –Determinants of capital structure and speed of adjustment measurement

Variables	Term	Measurement
Dependent variable:		
Debt Ratio at *t*	$Debt_t$	Ratio of total debt to total assets in year t
Independent variables:		
Capital structure determinants		
Debt Ratio at *t-1*	$Debt_{t-1}$	Ratio of total debt to total assets in year t-1
Business Risk	$Risk$	Standard deviation of the ratio of earnings before interest and taxes to total assets
Growth Opportunities	GO	Ratio of intangible assets to total assets
Profitability	$Profit$	Ratio of operating income before depreciation to total assets
Tangibility	$Tang$	Ratio of fixed assets to total assets
Size	$Size$	Logarithm of total assets
Age	Age	Number of years of firm's life
Uniqueness	$Unique$	Ratio of cost of employees to sales
Speed of adjustment determinants		
distance	*distance-speed*	Distance takes the value of 1 if $\lvert Debt^*_{i,t} - Debt_{i,t} \rvert$ is above mean and 0 if it is under the mean
growth opportunities	*growth-speed*	This variable is dichotomous: assumes the value of 1 if above the mean of the ratio of intangible assets to total assets and 0 if under the mean of the ratio of intangible assets to total assets
size	*size-speed*	This variable is dichotomous: assumes the value of 1 if above the mean of the logarithm of total assets and 0 if under the mean of the logarithm of total assets
financial flexibility	*flexibility-speed*	This variable is a result of multiplying two dichotomous variables: (i) the ratio of short-term debt to long- term debt, which equals 1 if above the mean and 0 if under the mean; (ii) operating cash flow, which equals 1 if above the mean and 0 if under the mean

Table 2 - Results of T-Test

Variables	After VC funding Mean	Before VC funding Mean	Difference t-test
$Debt_{i,t}$	0.476	0.511	0.035***
$Risk_{i,t}$	5.005	4.328	-0.678***
$GO_{i,t}$	0.176	0.106	-0.070***
$Profit_{i,t}$	-0.391	-0.151	0.240***
$Tang_{i,t}$	0.309	0.357	0.048***
$Size_{i,t}$	6.941	6.857	-0.083
$Age_{i,t}$	7.397	5.827	-1.570***
$Unique_{i,t}$	3.411	1.582	-1.829***

Note: *** p<0.01

Table 3 - Summary statistics

Variables	After VC funding			Before VC funding		
	Mean	Median	SD	Mean	Median	SD
$Debt_{i,t}$	0.48	0.46	0.3	0.51	0.53	0.3
$Risk_{i,t}$	4.9	2.2	8.3	4.3	1.8	7.6
$GO_{i,t}$	0.18	0.024	0.25	0.11	0.0026	0.19
$Profit_{i,t}$	-0.39	-0.18	0.65	-0.15	-0.0041	0.5
$Tang_{i,t}$	0.31	0.2	0.3	0.36	0.26	0.32
$Size_{i,t}$	6.9	7.1	1.6	6.9	7.1	1.8
$Age_{i,t}$	7.4	6.0	5.9	5.8	2.0	9.8
$Unique_{i,t}$	3.4	0.73	9.8	1.6	0.43	6.2

Table 4 - Fixed-effects: Optimal Capital Structure

Independent variables	After VC funding	Before VC funding
	Dependent variable: $Debt_{i,t}$	
$Risk_{i,t}$	-0.01323	-0.08323***
	(0.03464)	(0.02685)
$GO_{i,t}$	0.12464	0.06206**
	(0.08690)	(0.02932)
$Profit_{i,t}$	-0.09725***	-0.07911***
	(0.02089)	(0.01318)
$Tang_{i,t}$	0.19196**	0.05722***
	(0.07669)	(0.01943)
$Size_{i,t}$	-0.02569	0.01729***
	(0.01578)	(0.00441)
$Age_{i,t}$	0.01280***	-0.00231***
	(0.00423)	(0.00062)
$Unique_{i,t}$	-0.00251***	-0.00427***
	(0.00084)	(0.00059)
Constant	0.50309***	0.71013***
	(0.11525)	(0.03211)
Observations	1,128	3,548
Number of firms	411	883
R2 within	0.1429	0.0740
Wald test (F statistics)	16.91***	30.34***
Hausman test	38.71***	106.93***

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 - GMM system (1998) - Adjustment Toward Target Debt Ratio

Independent variables	After VC funding	Before VC funding
	Dependent variable: $\text{Debt}_{i,t}$	
$Debt_{i,t-1}$	0.31866**	0.51277***
	(0.14241)	(0.16578)
$\text{Risk}_{i,t}$	-0.06911	-0.39256**
	(0.06170)	(0.16648)
$\text{GO}_{i,t}$	-0.23656**	0.28223
	(0.09994)	(0.17357)
$\text{Profit}_{i,t}$	-0.19230***	-0.23083***
	(0.02489)	(0.03151)
$\text{Tang}_{i,t}$	0.17526**	0.30900***
	(0.08086)	(0.07858)
$\text{Size}_{i,t}$	-0.03584	0.07120**
	(0.01987)	(0.03087)
$\text{Age}_{i,t}$	0.00804***	0.00303*
	(0.00268)	(0.00159)
$\text{Unique}_{i,t}$	-0.00368***	-0.00303*
	(0.00103)	(0.00178)
$Debt_{i,t-1}$ * growth-speed	0.01341	-0.24738
	(0.08578)	(0.16946)
$Debt_{i,t-1}$ * size-speed	-0.29266**	-0.31947**
	(0.13437)	(0.15958)
$Debt_{i,t-1}$ * distance-speed	0.74261***	0.63931***
	(0.07910)	(0.12879)
$Debt_{i,t-1}$* flexibility-speed	-0.39253***	0.05206
	(0.14270)	(0.12212)
Time dummies	yes	yes
Constant	0.42425***	0.51317**
	(0.16068)	(0.21691)
Observations	838	1.770
Number of firms	338	575
F (N(0,1))	45.90***	43.26***
Hansen test	108.7	58.39
m1 (N(0,1))	-4.211***	-5.519***
m2 (N(0,1))	-0.175	-1.466

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 - Rational Adjustment to Target Debt: Before VC funding vs. After VC funding

	Before VC funding					After VC funding				
	$0 < \lambda < 1$ (Observations = 3606 = 87,6%)					$0 < \lambda < 1$ (Observations = 1196 = 93%)				
	Mean	Median	SD	Min	Max	Mean	Median	SD	Min	Max
λ	.4905245	.5001634	.1254746	.0008066	.7949537	.4798567	.4840097	.1089263	.0445067	.7515042
ω_{t-1}	1.075445	.8647481	.6701584	.2755441	3.81037	1.159989	.9209438	.699315	.3162994	3.77531
ω	1.043652	.8469345	.6339241	.2846473	3.626223	1.132111	.9184573	.6439454	.3123608	3.580459
Under-levered	$Debt_t > Debt_{t-1}$ (Observations = 1280 = 35,5%)					$Debt_t > Debt_{t-1}$ (Observations = 567 = 47,4%)				
	Mean	Median	SD	Min	Max	Mean	Median	SD	Min	Max
λ	.4786792	.4921591	.1299136	.0015703	.7404928	.4654372	.4675539	.1053887	.0699496	.7245904
ω_{t-1}	1.176224	.9456359	.7266322	.3144621	3.81037	1.293376	1.064716	.7337652	.35973	3.77531
ω	1.014162	.8246278	.6209229	.2995695	3.620228	1.042829	.87308	.5671088	.3516177	3.55163
Over-levered	$Debt_t < Debt_{t-1}$ (Observations = 2326 = 64,5%)					$Debt_t < Debt_{t-1}$ (Observations = 629 = 52,6%)				
	Mean	Median	SD	Min	Max	Mean	Median	SD	Min	Max
λ	.5002057	.5078953	.1251126	.0008066	.7949537	.4976085	.503171	.1062365	.1537732	.7515042
ω_{t-1}	.9940852	.8081903	.6082995	.2755441	3.753965	1.019692	.7870725	.6313926	.3162994	3.774581
ω	1.059236	.859324	.6400051	.2846473	3.626223	1.207528	.9854438	.6928825	.3123608	3.580459