CAPITAL STRUCTURE ADJUSTMENT PROCESS IN FIRMS
ACCESSING VENTURE FUNDING

MARINA BALBOA
JOSÉ MARTÍ
ÁLVARO TRESIERRA

FUNDACIÓN DE LAS CAJAS DE AHORROS
DOCUMENTO DE TRABAJO
Nº 614/2011
De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

ISSN: 1988-8767

La serie DOCUMENTOS DE TRABAJO incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.
Las opiniones son responsabilidad de los autores.
CAPITAL STRUCTURE ADJUSTMENT PROCESS
IN FIRMS ACCESSING VENTURE FUNDING

Marina Balboa*
José Martí**
Álvaro Tresierra***

Abstract

This paper analyses the dynamic behaviour of the capital structure in a sample of Spanish venture capital (VC) backed firms and a matched sample of firms that do not receive VC. The results show that the former adjust their target debt ratio more slowly, which could be explained either by the existence of more severe financial constraints in these firms, as shown in previous literature, or by the fact that these firms could be more concerned about financing their growth than about reaching the target debt level. Additionally, differences in the factors that affect the debt ratio are found between both groups, especially regarding growth opportunities. In this way, the paper also sheds light on the factors related to the financial structure of firms that could explain why they access VC funding. Regarding the implications, it should be remarked that growing firms that are able to take advantage of growth opportunities should approach VC firms to reduce the increased distance to their target debt levels, if those firms choose to go ahead with the required investments, and/or to allow those firms not to forgo their growth prospects because their owners are not willing to accept leverage ratios beyond the target.

Keywords: capital structure, adjustment speed, venture capital, trade-off theory

JEL Classification: G32, G24

* Dep. Financial Economics. University of Alicante (03080), Spain. Phone: +34 965903621. Email: marina.balboa@ua.es
** Dep. Finance. University Complutense of Madrid (28223), Spain. Phone: +34 913942310. Email: jmartipe@ccce.ucm.es
*** Dep. Finance. University of Piura, Peru. Phone: +51 73284500. Email: alvaro.tresierra@udep.pe

Acknowledgements: We thank the financial support from the Spanish Ministry of Education under research grant ECO2008-02599/ECON.
1 Introduction

All firms must raise funds to take advantage of their growth opportunities. This is, however, affected by the range of financial sources available, which is not the same for listed and unlisted firms. In addition to their internally generated funds, listed firms are able to issue shares and have easier access to the debt market than unlisted firms (Vanacker and Manigart, 2010). Listed firms are required to provide periodic reliable information about their past operations and future projects, thus reducing the problems stemming from information asymmetries. They usually are larger in size and have more tangible assets to use as collateral. In the same vein, their operations and future prospects are followed by analysts and assessed by rating agencies. Conversely, unlisted firms are only required to publish an annual report and are rarely monitored by analysts or rating agencies (González and González, 2007). Since their size is also lower than that of listed firms, they have fewer assets to use as collateral. As a result, they are most affected by information asymmetry problems when accessing external sources of funds to finance their investment projects (Berger and Udell, 1998; Brav, 2009), which cause a substantial difference between the cost of internal and external funds (Myers and Majluf, 1984; Carpenter and Petersen, 2002). Therefore, unlisted firms may forgo their growth opportunities, not carrying out positive net present value projects, when internal funds are insufficient to finance their investment opportunities (Gompers, 1995; Michaelas et al., 1999).

In this context, Venture Capital (VC) becomes an alternative external financial source, which provides funds in the form of equity or quasi-equity to unlisted firms exhibiting outstanding growth opportunities. In addition to much needed funds, VC firms also provide many value added services to investee firms, such as monitoring, advisory services and reputational capital (Sahlman, 1990). The VC literature has deeply analysed supply-side issues that justify the role played by VC firms, as well as the main firm characteristics that are found to be attractive to venture capitalists (VCs). However, there is little research on the demand side, specifically, on the financial characteristics of firms that induce them to search for VC (Baeyens and Manigart, 2006).
Focusing on the demand side of the market, this paper analyses the capital structure behaviour and the financial characteristics of the firms that later receive VC. We study the capital structure adjustment process in unlisted growing firms over time. In particular, we aim to analyse the dynamic behaviour of leverage in a sample of firms prior to the initial VC investment event, and whether the existing adjustment process, if there is one, can help to explain why these firms have access to VC funding later. To the best of our knowledge, this issue has not been previously addressed in the literature.

The analysis is based on a sample of Spanish unlisted firms at the expansion stage that received the initial VC investment during the period from 1995 to 2007. Our analyses are also carried out on a one-by-one matched sample of firms that do not receive VC (the control group, hereafter). Possible differences in the dynamic behaviour of leverage in both groups of firms may arise, since, by definition, the type of funds that each group is accessing is radically different and this entails different implications in terms of the capital structure behaviour.

In order to analyse the dynamic behaviour of leverage, we use a target adjustment model, where the target debt ratio is estimated as a linear function of the determinants of leverage proposed in the literature on capital structure. Given the dynamic processes found in firm leverage, the estimations are based on the Generalised Method of Moments estimator developed by Blundell and Bond (1998). The use of this technique allows us to address the autoregressive process found in the debt ratio and the fact that the explanatory variables, including the lagged value of the debt ratio, are potentially endogenous.

The results show that the group of firms that later obtain VC adjust their capital structure to a target debt ratio more slowly than the control group. This behaviour could be explained because the first group of firms could be more financially constrained, thus exhausting their internally generated funds and showing higher leverage ratios than those found in firms belonging to the control group. We also find some significant differences in the determinants of the target debt ratio. While the leverage of firms that later obtain VC is related to
tangible fixed assets, size, profitability and growth opportunities, only size and profitability are significant in explaining the leverage of the control group.

The rest of the paper is organised as follows. Section two provides an overview on the VC process in order to understand the functioning of this activity. Section three provides a brief review of the existing literature on capital structure, which is related to VC as a source of external finance. Section four describes the sample and the methodology. The results are presented in Section five. Section six concludes the paper and discusses the results obtained.

2 Venture capital activity

The stages of the VC process are mainly three: fundraising, investment and divestment. These stages characterize the cyclical behaviour of this activity. In a first stage, VC organizations raise funds which typically take the form of closed-end funds with a limited life span between eight and twelve years. As a general rule, when investors join a new fund, they sign just a commitment, since the money is disbursed as investments are approved. Additionally, investors often cannot always commit the amount of funds they would like to. This is due to the fact that VC organizations are usually reluctant to accept large sums of money, as the number of experienced investment managers often adjusts more slowly than the swings in capital (Gompers and Lerner, 2002). On average, the fundraising process takes between twelve and eighteen months.

The investment stage of the process begins when the VC organization activates a deal flow and starts screening investment proposals. The companies selected have to provide a comprehensive business plan. If an agreement is reached between both parties regarding the financial instruments to be used, a letter of intention is signed. Then, and before providing the money needed, the management team carries out a detailed investigation into the company concerned, which is known as due diligence. After that, the fund managers ask the investors to pay their share of the capital required. The whole process is slow and usually takes between fourteen and sixteen weeks since companies
which receive this type of finance are rarely stock market quoted. Due to the complexity of the process, the total time required to invest the majority of the fund is often around three years. It should be noted that VC organizations tend to invest in certain industries or stages of development of the firms where they can best provide experience, managerial advice and contacts with third parties (Norton and Tenenbaum, 1993).

In the final stage of the process the VC organization sells the shares of the companies in the portfolio, a process known as divestment. During the whole process and up to this moment, the aim of the fund managers is mainly to add value to the companies in the portfolio through management support and by providing credibility to third parties. The proceeds from divestments should be progressively returned to investors, so managers have to launch new funds to continue with the activity, which usually takes place every two or three years.

3 Venture capital and the capital structure adjustment process

3.1 Theories and evidence on capital structure and its adjustment process

Since the eighties, several theories have been proposed to explain the firm’s financial behaviour, with the most traditional ones being the Trade-off and the Pecking Order theories. The former states that firms balance the advantages and disadvantages of debt in establishing their capital structure, leading to the existence of an optimum level of debt (Bradley et al., 1984). However, due to market imperfections firms cannot achieve this optimum and therefore aim to rebalance their capital structure in an attempt to reach this level. On the contrary, the Pecking Order theory (Myers, 1984; Myers and Majluf, 1984), which is based on the existence of information asymmetries,

---

1 Other theories based on the market situation, such as market timing (Baker and Wurgler, 2002) or "inertia" (Welch, 2004), have been proposed in recent years to explain the behaviour of capital structure.

2 The advantages refer to tax shields (Modigliani and Miller, 1963; Mackie-Manson, 1990; Graham, 1996) and mitigation of agency free cash flow problems (Jensen, 1986). Disadvantages are related to bankruptcy costs (Kraus and Litzenberger, 1973) and agency conflicts (Jensen and Meckling, 1976; Myers, 1977)
establishes that firms follow a hierarchy in the use of funds with the aim of minimizing the financing costs. Therefore, internally generated funds are preferred over external ones and risky debt over equity. Under the Pecking Order theory, there is not an optimum level of debt, which would then depend, in each period, on the profitability and investment opportunities of the firm. In general, only the Trade-off theory states that each firm has an optimum level of debt (Flannery and Hankins, 2007).

The empirical evidence in a dynamic context, such as the one addressed in this paper, sets the validity of the Trade-off theory if leverage follows an adjustment process. However, Shyam-Sunder and Myers (1999) and Chen and Zhao (2005) argue that the reversion process of the leverage ratio can also be observed even if the Pecking Order theory holds. Thus, to some extent there is evidence that both theories could support the existence of a reversion of the leverage ratio. While some papers find evidence of the Trade-off theory (Jalilvand and Harris, 1984; Fischer et al., 1989; De Miguel and Pindado, 2001; Hovakimian et al., 2001; Ozkan, 2001; Flannery and Ragan, 2006; González and González, 2007; Lemmon et al., 2008; López-Gracia and Sogorb-Mira, 2008; Huang and Ritter, 2009; among others), others prove that the Pecking Order theory is able to explain better the firm’s financing behaviour (Shyam-Sunder and Myers, 1999; Watson and Wilson, 2002; Sánchez-Vidal and Martín-Ugedo, 2005). Some studies also find that there are mixed effects from both theories (Fama and French, 2002; Frank and Goyal, 2003).

Focusing on the Spanish economy and, in particular, on unlisted firms, which are severely affected by information asymmetry problems, some papers find evidence in favour of the Pecking Order theory (see Sánchez-Vidal and Martín-Ugedo, 2005; or Cardone and Cazorla, 2006, among others). However, some of these studies build on the methodology presented by Shyam-Sunder and Myers (1999), which is criticised by Chirinko and Singha (2000) as a valid test of the Pecking Order theory. Additionally, they are based on the negative relationship between profitability and debt, which could also be expected in a dynamic Trade-off framework (Strebulaev, 2007). In this sense, Gonzalez and Gonzalez (2007) and Lopez-Gracia and Sogorb-Mira (2008) conclude that both the Pecking Order theory and the Trade-off theory are useful in explaining the
firm’s financing behaviour. They find that the firm’s debt ratio follows an adjustment process to a target, but at a slow speed due to the high adjustment costs that these firms face. In this way, the literature shows that, in any case and under both theories, firms seem to adjust their debt ratio to some certain level, thus pointing to the importance of analysing this issue in a dynamic framework.

There is literature that analyses the drivers of the adjustment speed of the debt ratio. Drobetz and Wanzenried (2006) argue that the adjustment speed largely depends on firm characteristics, such as size, growth opportunities and the difference between the observed and the target debt ratio. In our opinion, these factors are proxies for attributes such as financial constraints and external financing costs, among others. Flannery and Hankins (2007) state that the adjustment process depends on external financing costs, financial constraints, potential costs of distress and the value of tax shields, which lead to an incomplete adjustment to the target leverage in each period. However, it should be noted that the aim of this paper is to estimate the adjustment speed in a group of firms that later receive VC, leaving for further research the factors that influence it.

2.2 Venture capital funding and the capital structure adjustment process

Unlisted firms, such as the ones analysed in this paper, are only required to report once a year, do not have a verifiable track record and are rarely monitored by analysts or rating agencies. As a consequence, they are most affected by problems derived from information asymmetries. Therefore, external investors do not have access to enough information about the firm’s investment projects (adverse selection) or can not ensure that the funds provided are used adequately (moral hazard).

Vanacker and Manigart (2010) affirm that most high growth companies, which are usually unlisted firms, have considerable outside financing needs. Nevertheless, to access bank loans, companies seeking external funding must hold sufficient tangible assets to be used as collateral. Additionally, moral hazard problems would make debt contracts more problematic, and more rigid covenants would be necessary to mitigate these problems (Berger and Udell,
If long term debt is not available, growing unlisted firms should then rely on short term debt to finance their projects, albeit this would affect the maturity-matching principle between assets and liabilities. Short term debt would also compromise the firm’s liquidity, as well as its financial situation. The restrained access to traditional external financing sources that growing firm’s experience could exert an influence over the adjustment speed of the leverage ratio. According to Flannery and Hankins (2007), financial constraints affect the rebalancing costs and, therefore, the speed of adjustment towards the target. This is in line with Dang et al. (2009), who find that financially constrained UK firms adjust their debt ratio more slowly than less constrained firms.

In this context, VC funding arises as an alternative long term financial source, which is often the only one available for unlisted firms. The study of the capital structure of VC-backed firms has received little attention in the literature. Most works concentrate on the instruments that should be used to guarantee the fulfilment of the contracts (Bergeman and Hedge, 1998; Cumming, 2005), but very few analyse the effect that VC could exert on the behaviour of the capital structure of firms in which they invest (one example is the research conducted by Hogan and Hudson, 2007). In particular, the study of the dynamic behaviour of the debt ratio in VC-backed firms has received scant attention. This paper aims to cover this gap by analysing the dynamic behaviour of the debt ratio in firms that later receive VC funds, and whether this behaviour can explain why these firms approach institutions that provide this type of funds later on.

The speed of adjustment towards a target in VC-backed firms may be driven by the lower financial flexibility that these firms face. Balboa et al. (2009) find that Spanish VC-backed firms exhibit greater growth opportunities, but also greater debt ratios, than similar firms that do not have access to VC funding, before the initial VC round. They argue that those firms might be exhausting their debt capacity before accessing VC funding. Those firms seem to focus on taking advantage of their growth opportunities rather than adjusting to their

---

3 Flannery and Hankins (2007) argue that the cost of external financing sources and financial constraints affect the rebalancing costs for the debt ratio. However, we think that the former affects the availability of funds for the firm, which could be reflected in the financial constraints that the firm faces.
target debt levels. In this sense, Manigart et al. (2002) and Bertoni et al. (2010) find evidence of the presence of more severe financial constraints in VC-backed firms than in non-VC-backed ones before the initial VC investment. On the other hand, Engel and Stiebale (2009) argue that firms selected by VCs might be confronted with credit rationing to a different extent than other firms do before the investment event and, thus, may be characterised by different debt levels. In this line, Baeyens and Manigart (2006) find that VC-backed firms have higher debt ratios than their non-VC-backed counterparts before the initial investment event. This could probably lead to a reduction in their additional debt capacity and, therefore, in their financial flexibility.

As a consequence, firms that obtain VC funding later are probably more financially constrained, or at least exhibit a lower financial flexibility. According to Flannery and Hankins (2007) and Dang et al. (2009) a slower speed of adjustment is expected in financially constrained firms. The following hypothesis follows naturally from this discussion.

VC-backed firms exhibit a lower speed of adjustment to the target before the initial VC investment event than similar firms that do not obtain VC funding.

2.3 The determinants of the target debt ratio

The factors related to leverage have been widely studied in the literature. In their review, Harris and Raviv (1991) argue that there is a general consensus about the determinants that affect the capital structure of the firm, including factors such as tangible fixed assets, size, probability of default, profitability, volatility, growth opportunities, tax effects, marketing expenditures, research and development expenditures and the specificity of the product. On the other hand, Frank and Goyal (2009) find that only tangibility, profitability and median industry leverage are reliable factors that explain leverage when the book value is considered.

Since we do not have information about marketing and research and development expenditures, nor about the specificity of the product, this paper considers the remaining characteristics for estimating a target debt ratio. These characteristics and their predicted effect on the debt ratio are presented in
Table 1. A more detailed review of these factors and their expected relationship can be found in Titman and Wessels (1988), Michaelas et al. (1999), López-Gracia and Sogorb-Mira (2008) and Frank and Goyal (2009), among others.

Table 1. Firm characteristics related to the target debt ratio and their predicted effect

<table>
<thead>
<tr>
<th>Firm characteristic</th>
<th>Effect on debt ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible assets</td>
<td>Positive</td>
</tr>
<tr>
<td>Size</td>
<td>Positive</td>
</tr>
<tr>
<td>Profitability</td>
<td>Positive / Negative</td>
</tr>
<tr>
<td>Volatility</td>
<td>Negative</td>
</tr>
<tr>
<td>Growth opportunities</td>
<td>Positive / Negative</td>
</tr>
<tr>
<td>Effective tax paid</td>
<td>Positive</td>
</tr>
</tbody>
</table>

In addition to the firm characteristics considered in the literature, the activity sector should also be included in the analysis. Scott and Martin (1975) and Bowen et al. (1982) affirm that leverage ratios exhibit significant differences across industries. Ferry and Jones (1979) find a slight statistical relation between the relative debt structure and the generic industry group of the firm. Bradley et al. (1984) also find that the long term average debt ratios are strongly related to the industry classification. Therefore, there seem to be some factors related to the industry classification that lead to different debt ratios across industries.

To name only a few of the industries considered in the literature, Gupta (1969) argues that industries with high fixed asset turnover tend to have high leverage. Titman and Wessels (1988) state that companies belonging to specialised manufacturing industries, which face high bankruptcy costs, should be less exposed to debt financing. Mackay and Phillips (2005) show that firms in concentrated industries have higher leverage than firms in competitive ones. Miao (2005) finds that industries with high technology growth, risky technology, high bankruptcy costs or high fixed operating costs have, on average, lower relative leverage. Antoniou et al. (2008) argue that capital intensive industries,
such as manufacturing and utilities, are characterised by high debt ratios while others, namely high-tech industries, are known to have low debt levels. In the same vein, Hogan and Hutson (2007) find that in new technology-based firms the use of debt is rare and equity financing is the preferred source of external funds. Finally, Frank and Goyal (2009) find evidence that companies belonging to the same industry are affected by similar competitive forces, such as the degree of competition or the product-market interaction, and these forces may have an influence on leverage.

Consequently, it is necessary to include industry effects in the analysis of the capital structure determinants and its dynamics. In this sense, Mackay and Phillips (2005) show that within-industry characteristics help to explain the capital structure choice. Moreover, if the omitted factors are correlated with one or more of the explanatory variables, the coefficients estimated could be biased (Parsons and Titman, 2008).

3 DATA AND METHODOLOGY

3.1 Data and sample selection

The data used in the analysis is based on a sample of Spanish unlisted firms. The period analysed covers initial VC investments reported from 1995 until 2007. The source of data is the Spanish Private Equity and Venture Capital Association (ASCRi) and www.webcapitalriesgo.com, which feeds an annual database in collaboration of one of the co-authors since 1984.4 The key advantage of using this database is that it covers all individual deals carried out in Spain, allowing us to create an unbiased sample that is close to the full population. According to these sources, during this period 2,651 firms were subject to a VC investment in Spain, excluding investments in financial and real estate sectors. We were able to fully identify 2,110 VC-backed firms, once duplicated firms (i.e. those affected by syndication and those invested by other VC investors in previous years) are excluded. Of these firms, 1,063 were initially funded at the seed or start-up stages, 779 were at the expansion stage and 268 belonged to the buyout and other late stages category.

4 No other official source keeps track of VC activity in Spain, neither the Bank of Spain nor the Securities and Exchange Commission (CNMV).
We focus the analysis on firms at the expansion stage for three reasons. First, since the capital structure behaviour is driven by very different factors and motivations depending on the stage of the firm, including firms at early, expansion and late stages would introduce several biases and derive to conclusions that may not be valid for all firms. Second, we analyse the behaviour of the capital structure before the VC investment event. Therefore, firms at the early stages have to be excluded because there are not enough data available to analyse this period. Third, we do not include firms at late stages because we are interested in analysing the dynamic behaviour of the debt ratio in firms that are supposed to suffer from information asymmetry problems, as stated in the previous section.

We found accounting data on 757 VC-backed firms at the expansion stage in the Official Trade Registers and the AMADEUS Database. We tried to match each VC-backed firm, one-by-one, with comparable firms not receiving VC funding. Comparable firms were randomly chosen from the AMADEUS Database, matching the sector, by means of the NACE Rev2 code (4-digit code), the number of employees, the revenues, the asset volumes, the age and the location. All these characteristics were matched in the year before the initial VC investment. We were able to identify a valid comparable firm for 605 firms that were later subject to a VC investment.

Nevertheless, the estimation process described in the following subsection requires data on at least six consecutive years, before the external financing event, to define instrumental variables efficiently (De Miguel and Pindado, 2001; Gaud et al., 2005). Since some firms were not old enough at the time of the initial investment, this requirement reduced our sample of VC-backed firms at the expansion stage to 237 firms, representing 30.4 per cent of the population of firms at that stage and 39.2 per cent of the sample of VC-backed firms for which we were able to identify a comparable non-VC-backed firm at the same stage. Our dataset also includes 237 comparable control group firms that meet the same data requirement.

---

5 This database records information on 1,202,363 Spanish firms.
6 In some cases we did not find a firm in the same region, so a firm in another Spanish region with a similar average level of personal income was selected.
We expect the impact of any survival bias to be limited because we focus on the pre-investment period, in which all VC-backed firms were obviously alive. Therefore, the survival bias could only marginally affect the control group firms, because the AMADEUS database deletes data on firms that disappear, albeit several years later. To mitigate this effect further, we randomly searched for comparable firms in old DVDs provided by AMADEUS when matching investments of the mid-nineties and those carried out around year 2000.

Panel A of Table 2 shows mean values for sales, headcount, total assets and age for the population of VC-backed firms at the expansion stage and those firms finally included in the sample. No significant differences are found for all variables, with the exception of age, so that the sample can confidently be considered as representative of the population. Panel B shows the same descriptive statistics but for the sample of firms that were later subject to a VC investment and the corresponding control group included in the sample. It is important to highlight that the mean values for all variables in both groups are not statistically different, thus showing a successful matching process based on all these characteristics.

Table 2. Mean of sales, headcount, total assets and age in the sample

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Sales*</th>
<th>Employees</th>
<th>Assets*</th>
<th>Age**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A-Comparison firms later receive VC: population vs. sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>757</td>
<td>27,195</td>
<td>180</td>
<td>23,867</td>
<td>12.593</td>
</tr>
<tr>
<td>Sample</td>
<td>237</td>
<td>25,461</td>
<td>185</td>
<td>22,865</td>
<td>18.515</td>
</tr>
<tr>
<td>p-value</td>
<td></td>
<td>0.7873</td>
<td>0.9132</td>
<td>0.8199</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

| **Panel B-Comparison sample: later receive VC vs. Control Group** |       |       |           |         |       |
| Later receive               |        |       |           |         |       |
| VC                           | 237    | 25,461 | 185       | 22,865  | 18.515|
| Control Group                | 237    | 22,955 | 153       | 17,382  | 17.404|
| p-value                      | 0.6501 | 0.5191 | 0.1969    | 0.2951  |

Data refers to the year before the VC investment event.
*Thousand constant 2005 Euros.
** In years.
Source: Amadeus Database.

7 This was to be expected, since we do not consider in the sample young firms at the expansion stage because data on six consecutive years before the initial investment are not available.
3.2 Model and methodology

The adjustment process of the debt ratio can be represented by a partial target adjustment model (De Miguel and Pindado, 2001; Lopez-Gracia and Sogorb-Mira, 2008). The form of the model shows that changes in the debt ratio \( (D^* - D_{it-1}^-) \) partially absorb the difference between the target level and the previous debt ratio \( (D^* - D_{it-1}^-) \):

\[
D_{it} - D_{it-1} = \alpha \left( D^*_{it} - D^*_{it-1} \right) \tag{1}
\]

where \( D_{it} \) and \( D_{it-1} \) are the debt levels in the current and the previous period, respectively, \( D^* \) is the company target debt level and \( \alpha \)\(^8\) measures the speed of adjustment. The adjustment costs\(^9\) are inversely related to \( \alpha \) and can be represented as \( 1 - \alpha \) (Lopez-Gracia and Sogorb-Mira, 2008). In this line, if \( \alpha \) is zero the adjustment costs are very high and the company never adjusts its debt level to reach the target \( (D_{it} = D_{it-1}) \). On the contrary, if \( \alpha \) is equal to one there are no adjustment costs and the company automatically reaches its target level \( (D^*_{it} = D^*_{it-1}) \). Thus, if firms follow an adjustment process to reach their target debt level, then the coefficient \( \alpha \) should have a positive value between 0 and 1 (Lopez-Gracia and Sogorb-Mira, 2008). This implies a dynamic behaviour, where a firm adjusts its debt level towards the target according to the value of transaction costs.

According to (1), the actual level of debt is determined by:

\[
D_{it} = \alpha D^*_{it} + (1 - \alpha)D_{it-1} \tag{2}
\]

In this equation, it should be highlighted that the target debt level is unknown and should be estimated. While in some works the target is externally determined (Jalilvand and Harris, 1984; Shyam-Sunder and Myers, 1999), most studies estimate this target through a regression that incorporates the

---

8 This coefficient is assumed to be constant across companies. Nevertheless, it is probable that each firm has an individual coefficient due to its individual specific characteristics.

9 As in Kayhan and Titman (2007), we simplify the specification of the adjustment costs by assuming that both leverage increasing and decreasing adjustments are symmetric. Byoun (2008) analysed the differences in the adjustment process according to whether the firm have above-target (below-target) debt with a financial surplus (deficit).
determinants of the capital structure shown in the previous section of this paper as explanatory variables (De Miguel and Pindado, 2001; Flannery and Ragan, 2006; González and González, 2007; Lopez-Gracia and Sogorb-Mira, 2008). The latter approach is the one considered in this paper, with the target being estimated by the following model:

\[ D_{it} = F (\text{Tangibility}, \text{Size}, \text{Profitability}, \text{Volatility}, \text{Growth opportunities}, \text{Effective tax paid}) \]  

(3)

Finally, incorporating equation (3) into equation (2) we have:

\[
D_{it} = \beta_0 + (1 - \alpha)D_{it-1} + \beta_1 \text{TANG}_{it} + \beta_2 \text{SIZE}_{it} + \beta_3 \text{PROF}_{it} + \beta_4 \text{VOL}_{it} + \beta_5 \text{GO}_{it} + \beta_6 \text{ETR}_{it} + \eta_i + \mu_{it}
\]  

(4)

where \( \eta_i \) represents the specific unobservable individual effects for each firm, which do not vary over time; and \( \mu_{it} \) is an error term. The definition of all the variables used in the estimation is as follows:

- \( D_{it} \): is the ratio between long term debt\(^{10} \) and total assets for each firm and year, as in Sogorb-Mira (2005).
- \( \text{Tang}_{it} \): is a measure of the tangibility of assets for each firm and year. In particular, we use two measures for this variable. Tang1 is the ratio between tangible fixed assets and total assets, as in Rajan and Zingales (1995), Hovakimian et al. (2001), Frank and Goyal (2003), and Flannery and Ragan (2006). Tang2 is the ratio between tangible fixed assets plus inventories and total assets, as in Titman and Wessels (1988) or Sogorb-Mira (2005).
- \( \text{Size}_{it} \): represent the size of the firm each year. It is measured by the natural logarithm of total assets, as in Titman and Wessels (1988), Hovakimian et al. (2001), Fama and French (2002) and Flannery and Rangan (2006), among others.
- \( \text{Prof}_{it} \): measures the profitability for each firm and year. As in Titman and Wessels (1988), Hovakimian et al. (2001), and Ozkan (2001), among others, we define it as the ratio between earnings before interest, taxes,

\(^{10}\) This category includes long term bank loans, long term debt issued by other firms belonging to the same corporate group, obligations related to leasing contracts and other long term debt. This latter category would include all bonds issued by the firm, including convertible bonds. However, the breakdown into these categories is not available.
depreciation and amortization (EBITDA) and total assets (Prof1); or as
the ratio between earnings before interest and taxes (EBIT) and total
assets (Prof2), as in Fama and French (2002), Frank and Goyal (2003),

- Vol_{it}: is a measure of volatility for each firm and year. Following Balboa et
  al. (2009), it is defined as a moving standard deviation computing the
  changes in EBITDA (Vol1), or EBIT (Vol2), of the current and the
  previous two years.

- GO_{it}: measures growth opportunities for each firm and year. As in
  Michaelas et al. (1999), we use the ratio between intangible assets and
  total assets.

- ETR_{it}: is the effective corporate tax paid for each firm and year, and it is
  computed, as suggested by Ozkan (2000) and Lopez-Gracia and
  Sogorb-Mira (2008), as the ratio between effective corporate tax paid
  and the earnings before tax.

Also, two control variables are included in the empirical models. First,
and in order to control for industry effects, we also include in the regression
analysis an industry variable representing the median leverage per year for
each group (Lemmon et al., 2008; Frank and Goyal, 2009). Second, all models
include time year dummies in order to control for possible time effects on the
leverage ratio of firms.

Regarding the methodology employed, the dynamic model used to
represent firm leverage behaviour requires the use of the Generalised Method
of Moments (GMM) estimators for dynamic panel data models. The estimations
are carried out using the Blundell and Bond (1998) GMM estimator, which
employs additional moment conditions based on first differences (in addition to
the levels) to increase the efficiency of the estimation. The use of GMM is the
adequate methodology when the data shows an autoregressive process (as
happens with the debt ratio) and there is a potential endogeneity problem in the
explanatory variables.

To check for a possible misspecification of the model, two tests are
carried out. The first is the Sargan test of over-identifying restrictions, which
confirms the validity of the instruments used by checking the absence of
correlation between the instruments used in the estimation and the error term. The second test examines the hypothesis of a serially uncorrelated error, since consistent estimations are only obtained if this is the case. In a dynamic model, such as the one estimated here, where differences of the variables are taken to remove the unobserved individual effects in the estimation of the model, this condition is verified if there is a lack of second order serial correlation in the first difference residuals.

3.3 Descriptive statistics

The debt ratios for both groups of firms are shown in Table 3. According to Panels A and B, firms that later receive VC are more indebted. This result is in line with Baeyens and Manigart (2006). However, when firms are split according to whether they belong to non-technology or technology sectors, it is shown that while in the former, firms that later receive VC funding show a higher debt ratio, in the latter both groups of firms show similar values. Overall, the results highlight the need to control for industry effects. The reason for the lack of difference in debt ratios of technology-based firms could be related to the public-sector funding provided by agencies such as ENISA\textsuperscript{11} or CDTI,\textsuperscript{12} controlled by the Ministry of Industry and Energy, which are available to both VC and non-VC-backed innovative firms.

\textsuperscript{11} Empresa Nacional de Innovación.

\textsuperscript{12} Centro para el Desarrollo Tecnológico e Industrial.
### Table 3. Descriptive statistics of the leverage ratio before the initial VC investment

**Panel A. Descriptive statistics of the debt ratio**

<table>
<thead>
<tr>
<th></th>
<th>Whole sample</th>
<th>Non tech firms</th>
<th>Tech firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs</td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>All firms</td>
<td>2,934</td>
<td>0.1199</td>
<td>0.1376</td>
</tr>
<tr>
<td>Later receive VC</td>
<td>1,489</td>
<td>0.1326</td>
<td>0.1311</td>
</tr>
<tr>
<td>Control Group</td>
<td>1,445</td>
<td>0.1068</td>
<td>0.1429</td>
</tr>
<tr>
<td>All firms</td>
<td>2,596</td>
<td>0.1201</td>
<td>0.1347</td>
</tr>
<tr>
<td>Later receive VC</td>
<td>1,308</td>
<td>0.1344</td>
<td>0.1278</td>
</tr>
<tr>
<td>Control Group</td>
<td>1,288</td>
<td>0.1056</td>
<td>0.1399</td>
</tr>
<tr>
<td>All firms</td>
<td>338</td>
<td>0.1182</td>
<td>0.1586</td>
</tr>
<tr>
<td>Later receive VC</td>
<td>181</td>
<td>0.1198</td>
<td>0.1529</td>
</tr>
<tr>
<td>Control Group</td>
<td>157</td>
<td>0.1164</td>
<td>0.1655</td>
</tr>
</tbody>
</table>

**Panel B. Debt ratio evolution prior to the initial VC investment**

<table>
<thead>
<tr>
<th>Group / Year</th>
<th>t - 1</th>
<th>t – 2</th>
<th>t - 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Whole sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean values</td>
<td>0.1590</td>
<td>0.1457</td>
<td>0.1375</td>
</tr>
<tr>
<td>Control Group</td>
<td>0.1037</td>
<td>0.1087</td>
<td>0.1099</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0001</td>
<td>0.0058</td>
<td>0.0342</td>
</tr>
<tr>
<td>Median values</td>
<td>0.1218</td>
<td>0.1151</td>
<td>0.1038</td>
</tr>
<tr>
<td>Control Group</td>
<td>0.0536</td>
<td>0.0458</td>
<td>0.0586</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0000</td>
<td>0.0000</td>
<td>0.0010</td>
</tr>
</tbody>
</table>

**Non tech firms**

| Mean values  | 0.1600 | 0.1482 | 0.1391 |
| Control Group| 0.1003 | 0.1033 | 0.1083 |
| p-value      | 0.0000 | 0.0012 | 0.0220 |

**Tech firms**

| Mean values  | 0.1516 | 0.1257 | 0.1253 |
| Control Group| 0.1301 | 0.1504 | 0.1222 |
| p-value      | 0.6774 | 0.6035 | 0.9479 |

| Median values| 0.0851 | 0.0931 | 0.0577 |
| Control Group| 0.0591 | 0.0805 | 0.0529 |
| p-value      | 0.7850 | 0.7850 | 0.7850 |

t: Year of the initial VC investment.
Panel B also reports that the debt ratios are significantly different between both groups of firms, despite the fact that they are not significantly different in age\textsuperscript{13} or size, as reported in Table 2. Additionally, for firms that later receive VC, debt ratios show a slightly increasing pattern prior to the entry of the VC firm (which could mean that the internally generated funds are insufficient to back up subsequent growth), whereas the ratios for the control group are overly similar over time. The continuous growth found in the debt ratios for firms that later receive VC could be signalling that these firms are not able to rebalance their capital structure very quickly, because they are in a growth process and try to use all sources of funds available. Again, differences in the behaviour of the debt ratio over time are found across sectors, with non-technology firms showing significant differences between the group that later receives VC funding and the group of similar firms that does not obtain funds from VC investors. As mentioned for the whole sample, those differences are significant in any of the three years before the investment event. Furthermore, an increasing pattern in the debt ratio is found in firms that were later subject to a VC investment, whereas the debt ratio in the group of firms that did not obtain VC funding does not change over time.

Regarding the variables related to the target debt ratio, Table 4 shows several descriptive statistics for the whole sample and the subsamples of firms that later receive VC and the control group firms, respectively. It also includes information on a t-test and a chi-squared test of difference in means and medians, respectively, between both groups of firms. The significant differences on tangibility, profitability, growth opportunities and effective taxes paid should be highlighted between both groups. These significant differences in factors related to leverage could signal a different financing behaviour between them.

\textsuperscript{13} According to Berger and Udell (1998), both firm characteristics affect the sources of funds available. It is important to highlight this fact because the differences found in the financing behaviour should be explained by other factors.
Table 4. Descriptive statistics of the exogenous variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group</th>
<th>Obs.</th>
<th>Mean</th>
<th>Median</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tang1</td>
<td>Whole</td>
<td>2,934</td>
<td>0.1917</td>
<td>0.1350</td>
<td>0.1902</td>
<td>0.0000</td>
<td>0.9240</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.2507</td>
<td>0.2110</td>
<td>0.1907</td>
<td>0.0000</td>
<td>0.9240</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.1309</td>
<td>0.0511</td>
<td>0.1694</td>
<td>0.0000</td>
<td>0.9220</td>
</tr>
<tr>
<td>Tang2</td>
<td>Whole</td>
<td>2,934</td>
<td>0.3400</td>
<td>0.3287</td>
<td>0.2277</td>
<td>0.0000</td>
<td>0.9751</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.4041</td>
<td>0.4074</td>
<td>0.2180</td>
<td>0.0000</td>
<td>0.9751</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.2738</td>
<td>0.2434</td>
<td>0.2184</td>
<td>0.0000</td>
<td>0.9748</td>
</tr>
<tr>
<td>Size</td>
<td>Whole</td>
<td>2,934</td>
<td>15.4525</td>
<td>15.4065</td>
<td>1.4717</td>
<td>8.8537</td>
<td>20.2716</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>15.5108</td>
<td>15.4512</td>
<td>1.4443</td>
<td>8.8537</td>
<td>20.2716</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>15.3924</td>
<td>15.3205</td>
<td>1.4975</td>
<td>11.4076</td>
<td>19.6797</td>
</tr>
<tr>
<td>Prof1</td>
<td>Whole</td>
<td>2,934</td>
<td>0.1132</td>
<td>0.1028</td>
<td>0.1064</td>
<td>-0.8000</td>
<td>0.7370</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.1044</td>
<td>0.0976</td>
<td>0.1069</td>
<td>-0.8000</td>
<td>0.7113</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.1223</td>
<td>0.1087</td>
<td>0.1052</td>
<td>-0.5111</td>
<td>0.7370</td>
</tr>
<tr>
<td>Prof2</td>
<td>Whole</td>
<td>2,934</td>
<td>0.0671</td>
<td>0.0609</td>
<td>0.1024</td>
<td>-0.9536</td>
<td>0.7111</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.0583</td>
<td>0.0568</td>
<td>0.1028</td>
<td>-0.9536</td>
<td>0.6168</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.0761</td>
<td>0.0653</td>
<td>0.1012</td>
<td>-0.6222</td>
<td>0.7111</td>
</tr>
<tr>
<td>Vol1</td>
<td>Whole</td>
<td>2,934</td>
<td>1.5342</td>
<td>0.2851</td>
<td>8.0027</td>
<td>0.0001</td>
<td>144.8789</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>1.6958</td>
<td>0.2860</td>
<td>9.0543</td>
<td>0.0001</td>
<td>144.8789</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>1.3676</td>
<td>0.2841</td>
<td>6.7489</td>
<td>0.0001</td>
<td>137.2539</td>
</tr>
<tr>
<td>Vol2</td>
<td>Whole</td>
<td>2,934</td>
<td>2.1030</td>
<td>0.4232</td>
<td>11.5574</td>
<td>0.0001</td>
<td>215.4583</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>2.3706</td>
<td>0.4150</td>
<td>12.4227</td>
<td>0.0002</td>
<td>207.3391</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>1.8272</td>
<td>0.4258</td>
<td>10.5892</td>
<td>0.0001</td>
<td>215.4583</td>
</tr>
<tr>
<td>GO</td>
<td>Whole</td>
<td>2,934</td>
<td>0.0606</td>
<td>0.0161</td>
<td>0.1101</td>
<td>0.0000</td>
<td>0.9886</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.0642</td>
<td>0.0233</td>
<td>0.1020</td>
<td>0.0000</td>
<td>0.8421</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.0569</td>
<td>0.0108</td>
<td>0.1178</td>
<td>0.0000</td>
<td>0.9885</td>
</tr>
<tr>
<td>ETR</td>
<td>Whole</td>
<td>2,934</td>
<td>0.2467</td>
<td>0.2984</td>
<td>0.1902</td>
<td>0.0000</td>
<td>1.0000</td>
</tr>
<tr>
<td></td>
<td>VC</td>
<td>1,489</td>
<td>0.2300</td>
<td>0.2700</td>
<td>0.1962</td>
<td>0.0000</td>
<td>1.0000</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>1,445</td>
<td>0.2639</td>
<td>0.3080</td>
<td>0.1823</td>
<td>0.0000</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Data refers to all years in the sample.

Tang1: Ratio between tangible fixed assets and total assets; Tang2: Ratio between tangible fixed assets plus inventories and total assets; Size: Natural logarithm of total assets; Prof1: Ratio between EBITDA and total assets; Prof2: Ratio between EBIT and total assets; Vol1: Moving standard deviation of the change in EBITDA, computing the current and the previous two years; Vol2: Moving standard deviation of the change in EBIT, computing the current and the two previous years; GO: Ratio between intangible assets and total assets; ETR: Ratio between the effective corporate tax paid and the earnings before tax.

Differences in means (t-test) and medians (chi-squared test statistic) are reported: firms that later receive VC (VC) vs. firms that not receive VC (CG).

Significance at levels ***1%, **5%, *10%.

Pair-wise correlations among all variables are shown in Table 5. Excluding the obvious conflict between variables included under the same category, there is no concern about the correlation among the remaining ones.
Table 5. Correlation matrix

<table>
<thead>
<tr>
<th>Variable</th>
<th>Tang1</th>
<th>Tang2</th>
<th>Size</th>
<th>Prof1</th>
<th>Prof2</th>
<th>Vol1</th>
<th>Vol2</th>
<th>GO</th>
<th>ETR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tang1</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tang2</td>
<td>0.774</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.110</td>
<td>0.128</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prof1</td>
<td>0.019</td>
<td>0.076</td>
<td>0.079</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>0.000</td>
<td>0.002</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prof2</td>
<td>0.058</td>
<td>0.095</td>
<td>0.049</td>
<td>0.916</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>0.074</td>
<td>0.000</td>
<td>0.297</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vol1</td>
<td>0.005</td>
<td>0.022</td>
<td>0.026</td>
<td>0.064</td>
<td>0.054</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.022</td>
<td>0.130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vol2</td>
<td>0.003</td>
<td>0.015</td>
<td>0.090</td>
<td>0.122</td>
<td>0.385</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GO</td>
<td>0.129</td>
<td>0.208</td>
<td>0.012</td>
<td>0.031</td>
<td>0.134</td>
<td>0.059</td>
<td>0.110</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>0.000</td>
<td>0.987</td>
<td>0.000</td>
<td>0.060</td>
<td>0.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETR</td>
<td>0.061</td>
<td>0.070</td>
<td>0.011</td>
<td>0.177</td>
<td>0.216</td>
<td>0.063</td>
<td>0.050</td>
<td>0.078</td>
<td>1.000</td>
</tr>
<tr>
<td>*</td>
<td>0.040</td>
<td>0.006</td>
<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
<td>0.026</td>
<td>0.240</td>
<td>0.011</td>
<td></td>
</tr>
</tbody>
</table>

Tang1: Ratio between tangible fixed assets and total assets; Tang2: Ratio between tangible fixed assets plus inventories and total assets; Size: Natural logarithm of total assets; Prof1: Ratio between EBITDA and total assets; Prof2: Ratio between EBIT and total assets; Vol1: Moving standard deviation of the change in EBITDA, computing the current and the previous two years; Vol2: Moving standard deviation of the change in EBIT, computing the current and the previous two years; GO: Ratio between intangible assets and total assets; ETR: Ratio between the effective corporate tax paid and the earnings before tax.

* p-values.

4 Results

Tables 6 and 7 show the results related to the variables Tang1 and Tang2, respectively, which are rather similar. For firms that later receive VC the coefficient of the debt ratio lagged one period \((1 - \alpha)\) is significant in all models, with the coefficient ranging between 0.4124 and 0.4639 in the case of firms that later receive VC funding and between 0.3763 and 0.3925 in the control group. As a result, the speed of adjustment varies from 0.5361 and 0.5876 in the former, whereas the range in the control group changes from 0.6075 to 0.6237. The average speed of adjustment of the different models estimated would stand
as 0.5624 for firms that were later subject to a VC investment and 0.6159 for the group of comparable firms not receiving VC funding.

Therefore, it seems that firms that later receive VC funding adjust their debt ratio more slowly than their similar matched firms selected as a control group. Since firms that later receive VC seem to be more affected by financial constraints, or exhibit less financial flexibility, our results are consistent with our hypothesis and with the evidence found by Dang et al. (2009). The limited financial flexibility hinders the chance to rebalance their capital structure to reach the target debt level. Additionally, these firms could be more concerned about financing their growth than about reaching the target debt level, which could be a second order consideration.

With regard to the factors related to the target debt ratio, we also find some differences between both groups of firms. In all models, tangibility, size, profitability and growth opportunities are significant for firms that later receive VC, whereas only size and profitability (tangibility is only fulfilled for $Tang1$) are significant in firms included in the control group. These differences on firm characteristics related to the debt ratio could imply a different financing behaviour in both groups. It should be highlighted that growth opportunities, which is an attribute VC investors pay attention to, is only significant, and positively related to the debt ratio, in firms that later receive VC.

In relation to industry effects, the variable median, which measures the median industry leverage and accounts for industry factors that may affect the debt ratio, is also introduced in the models estimated. This variable shows a positive relation with leverage, which is consistent with prior works (Lemmon et al., 2008; Frank and Goyal, 2009, among others). It should be noted that industry dummies can not be included in the models analysed, since the estimation process removes all the variables that are time invariant.
Table 6. Regression results considering Tang1

<table>
<thead>
<tr>
<th>Indep. Var.</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
<th>Model 3</th>
<th></th>
<th>Model 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VC</td>
<td>CG</td>
<td>VC</td>
<td>CG</td>
<td>VC</td>
<td>CG</td>
<td>VC</td>
<td>CG</td>
</tr>
<tr>
<td>Debtt-1</td>
<td>0.4124***</td>
<td>0.3836*</td>
<td>0.4235***</td>
<td>0.3764**</td>
<td>0.4140***</td>
<td>0.3840**</td>
<td>0.4254***</td>
<td>0.3763**</td>
</tr>
<tr>
<td></td>
<td>(0.1024)</td>
<td>(0.1608)</td>
<td>(0.1014)</td>
<td>(0.1553)</td>
<td>(0.0995)</td>
<td>(0.1630)</td>
<td>(0.0981)</td>
<td>(0.1574)</td>
</tr>
<tr>
<td>Tang1</td>
<td>0.2578***</td>
<td>0.1243**</td>
<td>0.2549***</td>
<td>0.1108**</td>
<td>0.2524***</td>
<td>0.1186**</td>
<td>0.2488***</td>
<td>0.1064**</td>
</tr>
<tr>
<td></td>
<td>(0.0709)</td>
<td>(0.0554)</td>
<td>(0.0715)</td>
<td>(0.0555)</td>
<td>(0.0718)</td>
<td>(0.0558)</td>
<td>(0.0726)</td>
<td>(0.0555)</td>
</tr>
<tr>
<td>Size</td>
<td>0.0195**</td>
<td>0.0376***</td>
<td>0.0192**</td>
<td>0.0315***</td>
<td>0.0217**</td>
<td>0.0381***</td>
<td>0.0214**</td>
<td>0.0329***</td>
</tr>
<tr>
<td></td>
<td>(0.0110)</td>
<td>(0.0137)</td>
<td>(0.0112)</td>
<td>(0.0108)</td>
<td>(0.0111)</td>
<td>(0.0141)</td>
<td>(0.0112)</td>
<td>(0.0107)</td>
</tr>
<tr>
<td>Prof1</td>
<td>-0.1149**</td>
<td>-0.0581*</td>
<td>-1.1208***</td>
<td>-0.0600**</td>
<td>(0.0451)</td>
<td>(0.0337)</td>
<td>(0.0433)</td>
<td>(0.0343)</td>
</tr>
<tr>
<td>Prof2</td>
<td>-0.0004</td>
<td>-0.0001</td>
<td>-0.0004</td>
<td>-0.0001</td>
<td>(0.0008)</td>
<td>(0.0002)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vol1</td>
<td>-0.0002</td>
<td>-0.0000</td>
<td>-0.0002</td>
<td>-0.0000</td>
<td>(0.0006)</td>
<td>(0.0003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vol2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GO</td>
<td>0.2485***</td>
<td>0.3446**</td>
<td>0.2409***</td>
<td>0.3474**</td>
<td>0.2455***</td>
<td>0.3273*</td>
<td>0.2372***</td>
<td>0.3295*</td>
</tr>
<tr>
<td></td>
<td>(0.0733)</td>
<td>(0.2044)</td>
<td>(0.0769)</td>
<td>(0.2044)</td>
<td>(0.0766)</td>
<td>(0.1985)</td>
<td>(0.0807)</td>
<td>(0.1987)</td>
</tr>
<tr>
<td>ETR</td>
<td>-0.0069</td>
<td>-0.0070</td>
<td>-0.0065</td>
<td>-0.0089</td>
<td>-0.0062</td>
<td>-0.0060</td>
<td>-0.0054</td>
<td>-0.0077</td>
</tr>
<tr>
<td></td>
<td>(0.0212)</td>
<td>(0.0168)</td>
<td>(0.0209)</td>
<td>(0.0173)</td>
<td>(0.0211)</td>
<td>(0.0165)</td>
<td>(0.0208)</td>
<td>(0.0169)</td>
</tr>
<tr>
<td>Median</td>
<td>0.3535**</td>
<td>0.7385*</td>
<td>0.3564**</td>
<td>0.7388*</td>
<td>0.3378**</td>
<td>0.6967*</td>
<td>0.3408</td>
<td>0.6894</td>
</tr>
<tr>
<td></td>
<td>(0.1854)</td>
<td>(0.4028)</td>
<td>(0.1888)</td>
<td>(0.4254)</td>
<td>(0.1828)</td>
<td>(0.3872)</td>
<td>(0.1855)</td>
<td>(0.4089)</td>
</tr>
<tr>
<td>Time dummies</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.3024</td>
<td>-0.5382**</td>
<td>-0.3416**</td>
<td>-0.5078***</td>
<td>-0.3356**</td>
<td>-0.5431***</td>
<td>-0.3769**</td>
<td>-0.5286***</td>
</tr>
<tr>
<td></td>
<td>(0.1739)</td>
<td>(0.2044)</td>
<td>(0.1655)</td>
<td>(0.1722)</td>
<td>(0.1760)</td>
<td>(0.2102)</td>
<td>(0.1668)</td>
<td>(0.1695)</td>
</tr>
<tr>
<td>m²</td>
<td>1.0533</td>
<td>0.0964</td>
<td>1.0397</td>
<td>0.0748</td>
<td>1.0458</td>
<td>0.0115</td>
<td>1.0301</td>
<td>-0.0198</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2922</td>
<td>0.9232</td>
<td>0.2985</td>
<td>0.9404</td>
<td>0.2956</td>
<td>0.9908</td>
<td>0.3030</td>
<td>0.9842</td>
</tr>
<tr>
<td>Sargan</td>
<td>63.0480</td>
<td>63.5624</td>
<td>62.2026</td>
<td>64.6389</td>
<td>62.1563</td>
<td>62.9466</td>
<td>61.3927</td>
<td>63.9442</td>
</tr>
<tr>
<td>p-value</td>
<td>0.1868</td>
<td>0.1114</td>
<td>0.2073</td>
<td>0.0950</td>
<td>0.2084</td>
<td>0.1218</td>
<td>0.2282</td>
<td>0.1053</td>
</tr>
</tbody>
</table>

Regressions are estimated using the Blundell and Bond GMM estimator for panel data.
Dependent variable: Ratio between long term debt and total assets. Independent Variables: Tang1: Ratio between tangible fixed assets and total assets; Size: Natural logarithm of total assets; Prof1: Ratio between EBITDA and total assets; Vol1: Moving standard deviation of the change in EBITDA, computing the current and the two previous years; Vol2: Moving standard deviation of the change in EBIT, computing the current and the two previous years; GO: Ratio between intangible assets and total assets; ETR: Ratio between the effective corporate tax paid and the earnings before tax; Median: median leverage per year and industry group.
m²: is the second order serial correlation test.
Sargan: is the Sargan test of the overidentifying restrictions.
Robust standard errors in brackets.
Significance at levels *** 1%, ** 5%, * 10%.
Table 7. Regression results considering Tang2

<table>
<thead>
<tr>
<th>Indep. Var.</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VC</td>
<td>CG</td>
<td>VC</td>
<td>CG</td>
</tr>
<tr>
<td>Debt_t-1</td>
<td>0.4505</td>
<td>0.3925</td>
<td>0.4639</td>
<td>0.3841</td>
</tr>
<tr>
<td></td>
<td>(0.1001)</td>
<td>(0.1564)</td>
<td>(0.0965)</td>
<td>(0.1522)</td>
</tr>
<tr>
<td>Tang2</td>
<td>0.0961</td>
<td>0.0330</td>
<td>0.0961</td>
<td>0.0231</td>
</tr>
<tr>
<td></td>
<td>(0.0380)</td>
<td>(0.0343)</td>
<td>(0.0379)</td>
<td>(0.0343)</td>
</tr>
<tr>
<td>Size</td>
<td>0.0261</td>
<td>0.0363</td>
<td>0.0254</td>
<td>0.0310</td>
</tr>
<tr>
<td></td>
<td>(0.0117)</td>
<td>(0.0149)</td>
<td>(0.0119)</td>
<td>(0.0121)</td>
</tr>
<tr>
<td>Prof1</td>
<td>-0.1169</td>
<td>-0.0639</td>
<td>-0.1269</td>
<td>-0.0656</td>
</tr>
<tr>
<td></td>
<td>(0.0445)</td>
<td>(0.0334)</td>
<td>(0.0427)</td>
<td>(0.0340)</td>
</tr>
<tr>
<td>Prof2</td>
<td>-0.0005</td>
<td>-0.0001</td>
<td>-0.0005</td>
<td>-0.0001</td>
</tr>
<tr>
<td></td>
<td>(0.0007)</td>
<td>(0.0002)</td>
<td>(0.0007)</td>
<td>(0.0002)</td>
</tr>
<tr>
<td>Vol1</td>
<td>-0.0003</td>
<td>-0.0000</td>
<td>-0.0003</td>
<td>-0.0000</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(0.0003)</td>
<td>(0.0005)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>Vol2</td>
<td>0.2361</td>
<td>0.3306</td>
<td>0.2301</td>
<td>0.3376</td>
</tr>
<tr>
<td></td>
<td>(0.0724)</td>
<td>(0.1991)</td>
<td>(0.0759)</td>
<td>(0.2025)</td>
</tr>
<tr>
<td>GO</td>
<td>-0.0090</td>
<td>-0.0063</td>
<td>-0.0097</td>
<td>-0.0079</td>
</tr>
<tr>
<td></td>
<td>(0.0199)</td>
<td>(0.0179)</td>
<td>(0.0196)</td>
<td>(0.0182)</td>
</tr>
<tr>
<td>ETR</td>
<td>0.3786</td>
<td>0.6789</td>
<td>0.3852</td>
<td>0.6817</td>
</tr>
<tr>
<td></td>
<td>(0.1884)</td>
<td>(0.3902)</td>
<td>(0.1872)</td>
<td>(0.4151)</td>
</tr>
<tr>
<td>Median</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Time dummies</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-0.4019</td>
<td>-0.5105</td>
<td>-0.3936</td>
<td>-0.4287</td>
</tr>
<tr>
<td></td>
<td>(0.1911)</td>
<td>(0.2212)</td>
<td>(0.1916)</td>
<td>(0.1799)</td>
</tr>
<tr>
<td>m2</td>
<td>1.0189</td>
<td>-0.0480</td>
<td>1.0063</td>
<td>-0.0940</td>
</tr>
<tr>
<td>p-value</td>
<td>0.3082</td>
<td>0.9617</td>
<td>0.3143</td>
<td>0.9251</td>
</tr>
<tr>
<td>Sargan</td>
<td>62.3181</td>
<td>61.6297</td>
<td>60.5420</td>
<td>62.5654</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2044</td>
<td>0.1464</td>
<td>0.2516</td>
<td>0.1285</td>
</tr>
</tbody>
</table>

Regressions are estimated using the Blundell and Bond GMM estimator for panel data. Dependent variable: Ratio between long term debt and total assets. Independent variables: Tang2: Ratio of tangible fixed assets plus inventories and total assets; Size: Natural logarithm of total assets; Prof1: Ratio between EBITDA and total assets; Prof2: Ratio between EBIT and total assets; Vol1: Moving standard deviation of the change in EBITDA, computing the current and the two previous years; Vol2: Moving standard deviation of the change in EBIT, computing the current and the two previous years; GO: Ratio between intangible assets and total assets; ETR: Ratio between the effective corporate tax paid and the earnings before tax; Median: median leverage per year and industry group.

m2: second order serial correlation test.
Sargan: is the Sargan test of the overidentifying restrictions.
Robust standard errors in brackets.
Significance at levels *** 1%, ** 5%, * 10%.

An important consideration in all the previous estimations has to do with the fact that the models are estimated, separately, for the two subsamples, which considerably reduces the number of observations used to estimate the models. Thus, we employ an alternative way to test for the relative lower speed of adjustment found in firms that later receive VC, which exploits all the
information more efficiently. In particular, we include an interaction term which is defined as the product of the debt ratio, lagged one period, and the dummy variable VC (which takes value 1 for firms that later receive VC, and zero otherwise), thus using all the observations together in the same estimation. In this way, the term corresponding to the lagged debt ratio is $a_1 D_{i,t-1} + a_2 D_{i,t-1} VC$. The adjustment costs are equal to $a_1$ in firms that are not financed by VC, whereas those costs are represented by $a_1 + a_2$ in firms that later receive VC funding.

As shown in Table 8 the results obtained on the speed of adjustment are significant in all models. Regarding the estimated coefficients in the different models, $a_1$ ranges from 0.2334 to 0.2543, with the average value being $a_1 = 0.2430$. Regarding $a_2$, the estimate values are between 0.2881 and 0.3589, with the mean value being $a_2 = 0.3244$. These results imply an average speed of adjustment of 0.7570 and 0.4327 for the control group and for firms that later receive VC, respectively. These results confirm that the adjustment process to the target in the case of firms that later receive VC is slower than in the control group.
Table 8. Regression results considering an interaction term

<table>
<thead>
<tr>
<th>Indep. Var.</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt(_t)-1</td>
<td>0.2494***</td>
<td>0.2543**</td>
<td>0.2440***</td>
<td>0.2482**</td>
<td>0.2377***</td>
<td>0.2408**</td>
<td>0.2334***</td>
<td>0.2362**</td>
</tr>
<tr>
<td>(0.1192)</td>
<td>(0.1167)</td>
<td>(0.1201)</td>
<td>(0.1171)</td>
<td>(0.1128)</td>
<td>(0.1099)</td>
<td>(0.1138)</td>
<td>(0.1105)</td>
<td></td>
</tr>
<tr>
<td>Debt(_t)-1 x VC</td>
<td>0.3006***</td>
<td>0.2881***</td>
<td>0.3042***</td>
<td>0.2915***</td>
<td>0.3569**</td>
<td>0.3469**</td>
<td>0.3589**</td>
<td>0.3477**</td>
</tr>
<tr>
<td>(0.1655)</td>
<td>(0.1615)</td>
<td>(0.1668)</td>
<td>(0.1623)</td>
<td>(0.1512)</td>
<td>(0.1480)</td>
<td>(0.1527)</td>
<td>(0.1492)</td>
<td></td>
</tr>
<tr>
<td>Tang</td>
<td>0.1716***</td>
<td>0.1697***</td>
<td>0.1670***</td>
<td>0.1650***</td>
<td>0.0537**</td>
<td>0.0512**</td>
<td>0.0517</td>
<td>0.0496</td>
</tr>
<tr>
<td>(0.0456)</td>
<td>(0.0454)</td>
<td>(0.0457)</td>
<td>(0.0455)</td>
<td>(0.0265)</td>
<td>(0.0258)</td>
<td>(0.0264)</td>
<td>(0.0257)</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.0267***</td>
<td>0.0259***</td>
<td>0.0282***</td>
<td>0.0278***</td>
<td>0.0296***</td>
<td>0.0289***</td>
<td>0.0310***</td>
<td>0.0307***</td>
</tr>
<tr>
<td>(0.0076)</td>
<td>(0.0059)</td>
<td>(0.0076)</td>
<td>(0.0059)</td>
<td>(0.0074)</td>
<td>(0.0060)</td>
<td>(0.0075)</td>
<td>(0.0061)</td>
<td></td>
</tr>
<tr>
<td>Prof1</td>
<td>-0.0983***</td>
<td>-0.1057***</td>
<td>-0.1078***</td>
<td>-0.1161***</td>
<td>-0.1075***</td>
<td>-0.1039***</td>
<td>-0.1080***</td>
<td>-0.1152***</td>
</tr>
<tr>
<td>(0.0277)</td>
<td>(0.0270)</td>
<td>(0.0304)</td>
<td>(0.0300)</td>
<td>(0.0284)</td>
<td>(0.0275)</td>
<td>(0.0312)</td>
<td>(0.0306)</td>
<td></td>
</tr>
<tr>
<td>Prof2</td>
<td>-0.0005</td>
<td>-0.0006</td>
<td>-0.0005</td>
<td>-0.0006</td>
<td>-0.0005</td>
<td>-0.0005</td>
<td>-0.0005</td>
<td>-0.0005</td>
</tr>
<tr>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td>(0.0005)</td>
<td></td>
</tr>
<tr>
<td>Vol1</td>
<td>-0.0007***</td>
<td>-0.0008***</td>
<td>-0.0007***</td>
<td>-0.0007***</td>
<td>-0.0007***</td>
<td>-0.0007***</td>
<td>-0.0007***</td>
<td>-0.0007***</td>
</tr>
<tr>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td>(0.0004)</td>
<td></td>
</tr>
<tr>
<td>Vol2</td>
<td>0.2916***</td>
<td>0.2923***</td>
<td>0.2873***</td>
<td>0.2895***</td>
<td>0.2721***</td>
<td>0.2758***</td>
<td>0.2678***</td>
<td>0.2728***</td>
</tr>
<tr>
<td>(0.0791)</td>
<td>(0.0796)</td>
<td>(0.0789)</td>
<td>(0.0797)</td>
<td>(0.0735)</td>
<td>(0.0748)</td>
<td>(0.0737)</td>
<td>(0.0753)</td>
<td></td>
</tr>
<tr>
<td>GO</td>
<td>-0.0081</td>
<td>-0.0079</td>
<td>-0.0079</td>
<td>-0.0075</td>
<td>-0.0086</td>
<td>-0.0087</td>
<td>-0.0084</td>
<td>-0.0084</td>
</tr>
<tr>
<td>(0.0142)</td>
<td>(0.0140)</td>
<td>(0.0141)</td>
<td>(0.0140)</td>
<td>(0.0144)</td>
<td>(0.0143)</td>
<td>(0.0143)</td>
<td>(0.0143)</td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>0.3498***</td>
<td>0.3316***</td>
<td>0.3476***</td>
<td>0.3286***</td>
<td>0.3265***</td>
<td>0.3141***</td>
<td>0.3263***</td>
<td>0.3106***</td>
</tr>
<tr>
<td>(0.1374)</td>
<td>(0.1327)</td>
<td>(0.1365)</td>
<td>(0.1319)</td>
<td>(0.1354)</td>
<td>(0.1309)</td>
<td>(0.1347)</td>
<td>(0.1303)</td>
<td></td>
</tr>
<tr>
<td>m2</td>
<td>1.0215</td>
<td>1.0017</td>
<td>1.0102</td>
<td>0.9840</td>
<td>0.9719</td>
<td>0.9484</td>
<td>0.9623</td>
<td>0.9340</td>
</tr>
<tr>
<td>p-value</td>
<td>0.0307</td>
<td>0.3165</td>
<td>0.3124</td>
<td>0.3251</td>
<td>0.3311</td>
<td>0.3429</td>
<td>0.3359</td>
<td>0.3503</td>
</tr>
<tr>
<td>Sargan</td>
<td>98.8738</td>
<td>93.8959</td>
<td>98.1746</td>
<td>93.0889</td>
<td>98.7640</td>
<td>94.1875</td>
<td>98.3547</td>
<td>93.6001</td>
</tr>
<tr>
<td>p-value</td>
<td>0.2934</td>
<td>0.4255</td>
<td>0.3105</td>
<td>0.4486</td>
<td>0.2960</td>
<td>0.4172</td>
<td>0.3061</td>
<td>0.4339</td>
</tr>
</tbody>
</table>

Regressions are estimated using the Blundell and Bond GMM estimator for panel data.
Dependent variable: Ratio between long term debt and total assets. Independent Variables: VC: dummy variable that takes value 1 for firms that later receive VC and zero otherwise; Tang1: Ratio between tangible fixed assets and total assets; Tang2: Ratio between tangible fixed assets plus inventories and total assets; Size: Natural logarithm of total assets; Prof1: Ratio between EBITDA and total assets; Prof2: Ratio between EBIT and total assets; Vol1: Moving standard deviation of the change in EBITDA, computing the current and the two previous years; Vol2: Moving standard deviation of the change in EBIT, computing the current and the two previous years; GO: Ratio between intangible assets and total assets; ETR: Ratio between the effective corporate tax paid and the earnings before tax; Median: median leverage per year and industry.
m2: is the second order serial correlation test.
Sargan: is the Sargan test of the overidentifying restrictions.
Robust standard errors in brackets.
Significance at levels *** 1%, ** 5%, * 10%.
4.1 Robustness analyses

To further increase the confidence in our results, some checks for robustness are also performed. The first one relates to the industry effects. As in Frank and Goyal (2009), the median asset growth for industry and year is considered as a proxy for these effects. The results remain unchanged, with the coefficient of the industry variable being negative and significant.

Additionally, it is important to take into account that most of the firms considered in this paper are small and medium sized firms, for which total current liabilities represent a high percentage of their capital structure. Thus, in order to check the robustness of the results, the regressions are also carried out using another measure for the dependent variable that also includes these liabilities. In particular, a total debt ratio, defined as the sum of long term debt and total current liabilities, is also employed. The results obtained are consistent with our findings and also show significant different values in the speed of adjustment between both groups, with the speed being lower in the group of VC-backed firms.

To sum up, significant differences in the speed of adjustment to the target debt ratio are found between firms that later receive VC and similar firms that do not obtain VC funding. Additionally, differences in the factors that affect the debt ratio are also found between both groups.

5 Conclusions and discussion

Most of the literature about VC is focused on the supply side. To contribute with a better understanding of the demand side of the market, the aim of this paper is to analyse the differences in the capital structure of firms that later receive VC with those that do not obtain VC funding. In particular, the focus of this paper is to analyse the dynamic behaviour of the debt ratio in firms that are able to attract VC later. We predict that VC firms that attract VC funding have sound growth opportunities and, simultaneously, their managers are willing to access any external source available. Therefore, their managers are more concerned about funding the required investments rather than adjusting the firm’s debt ratio to a target level. In this way, we hypothesise that the speed of adjustment to the target debt level in those firms should be slower than that
of similar unlisted firms that did not have greater growth opportunities and/or in situations where their managers are reluctant to access external sources to carry out the required investments.

The adjustment speed to the target debt ratio is estimated for Spanish unlisted firms that later receive VC and these results are compared with a one-by-one matched sample of similar firms that are not financed by VC. Significant differences in the speed of adjustment are found between both groups of firms, with the adjustment process to the target debt level being slower in firms that later receive VC, as expected. In this way, this paper contributes to the literature on entrepreneurial finance by providing firm evidence on the differences in the dynamic behaviour of leverage in firms that are later financed by VC. The difference found in the speed of adjustment between both groups of firms is consistent with prior studies that show that firms that later access VC funding are probably more financially constrained, thus affecting their capacity to rebalance the capital structure. Our results also show that the speed of adjustment of firms that are not subject to VC funding, as is the case of most firms in the Spanish economy, is smaller than that estimated by De Miguel and Pindado (2001) on a sample of Spanish listed firms. However, Gonzalez and Gonzalez (2007) show that the speed of adjustment for a sample that includes both listed and unlisted Spanish firms is lower than that found in De Miguel and Pindado (2001), making the results more comparable to our sample of firms that are not subject to VC funding. The lower speed of adjustment for unlisted firms could be explained by the fact that adjustment costs for these firms could be unusually large (Flannery and Rangan, 2006). When compared with firms that are later backed by VC, the higher speed of adjustment found in unlisted firms that were not subject to a VC investment, which is line with the ideas of Dang et al. (2009), could be explained by the fact that those firms may forgo their growth opportunities to avoid reaching a debt ratio which is not close to the target.

We also find differences between both groups of firms in the factors that affect the target debt ratio, especially regarding the proxy for growth opportunities, which is only significant in the group of firms that later receive VC. These results are in line with the ones found by Balboa et al. (2009), which are based on a static model. The fact that the results are similar under both a static
and a dynamic methodology points to the robustness of the results regarding the determinants of the debt ratio.

As regards the limitations, and due to unavailability of data, some variables that are sometimes considered in the literature based on listed firms could not be considered in this study. We were unable to test the impact of marketing and research & development expenditures, or other variables concerning the specificity of the product, on the debt ratio. Alternatively, data on patents could also be used, but this could only be carried out as more data becomes available in the case of Spain.

Several implications derive from the results obtained in this paper. For growing firms, those able to take advantage of growth opportunities should approach VC firms to carry out the required investments to avoid being financially constrained or, else, to be forced to abandon their growth prospects. Regarding policy makers, our findings provide evidence on the role that VC firms play on growing unlisted firms, as a source of external funds that help to reduce the dependency on the internally generated funds. We provide a financial explanation on why growing unlisted Spanish firms approach, or are attracted by, VC firms, overcoming their natural reluctance to allow an external investor to become a shareholder of the firm.

Regarding future research, it would be interesting to test how the speed of adjustment, as well as the capital structure determinants, changes after the VC investment. In this line, the type of VC investor involved should also be considered in the analyses. Finally, it should be interesting to test whether the results obtained in this sample of Spanish firms that later receive VC are also found in other countries.
References


Últimos números publicados

159/2000 Participación privada en la construcción y explotación de carreteras de peaje
        Ginés de Rus, Manuel Romero y Lourdes Trujillo

160/2000 Errores y posibles soluciones en la aplicación del Value at Risk
        Mariano González Sánchez

161/2000 Tax neutrality on saving assets. The spahish case before and after the tax reform
        Cristina Ruza y de Paz-Curbera

162/2000 Private rates of return to human capital in Spain: new evidence
        F. Barceinas, J. Oliver-Alonso, J.L. Raymond y J.L. Roig-Sabaté

163/2000 El control interno del riesgo. Una propuesta de sistema de límites
        riesgo neutral
        Mariano González Sánchez

164/2001 La evolución de las políticas de gasto de las Administraciones Públicas en los años 90
        Alfonso Utrilla de la Hoz y Carmen Pérez Esparrells

165/2001 Bank cost efficiency and output specification
        Emili Tortosa-Ausina

166/2001 Recent trends in Spanish income distribution: A robust picture of falling income inequality
        Josep Oliver-Alonso, Xavier Ramos y José Luis Raymond-Bara

167/2001 Efectos redistributivos y sobre el bienestar social del tratamiento de las cargas familiares en
        el nuevo IRPF
        Nuria Badenes Plá, Julio López Laborda, Jorge Onrubia Fernández

168/2001 The Effects of Bank Debt on Financial Structure of Small and Medium Firms in some European Countries
        Mónica Melle-Hernández

169/2001 La política de cohesión de la UE ampliada: la perspectiva de España
        Ismael Sanz Labrador

170/2002 Riesgo de liquidez de Mercado
        Mariano González Sánchez

171/2002 Los costes de administración para el afiliado en los sistemas de pensiones basados en cuentas
        de capitalización individual: medida y comparación internacional.
        José Enrique Devesa Carpio, Rosa Rodríguez Barrera, Carlos Vidal Meliá

        y propuestas de metodología para la explotación de la información de los ingresos y el gasto.
        Llorenc Pou, Joaquín Alegre

173/2002 Modelos paramétricos y no paramétricos en problemas de concesión de tarjetas de credito.
        Rosa Puertas, María Bonilla, Ignacio Olmeda
<table>
<thead>
<tr>
<th>Ano</th>
<th>Título</th>
<th>Autor(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>174/2002</td>
<td>Mercado único, comercio intra-industrial y costes de ajuste en las manufacturas españolas.</td>
<td>José Vicente Blanes Cristóbal</td>
</tr>
<tr>
<td>175/2003</td>
<td>La Administración tributaria en España. Un análisis de la gestión a través de los ingresos y de los gastos.</td>
<td>Juan de Dios Jiménez Aguilera, Pedro Enrique Barrilao González</td>
</tr>
<tr>
<td>176/2003</td>
<td>The Falling Share of Cash Payments in Spain.</td>
<td>Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey</td>
</tr>
<tr>
<td>177/2003</td>
<td>Effects of ATMs and Electronic Payments on Banking Costs: The Spanish Case.</td>
<td>Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey</td>
</tr>
<tr>
<td>178/2003</td>
<td>Factors explaining the interest margin in the banking sectors of the European Union.</td>
<td>Joaquín Maudos y Juan Fernández Guevara</td>
</tr>
<tr>
<td>179/2003</td>
<td>Los planes de stock options para directivos y consejeros y su valoración por el mercado de valores en España.</td>
<td>Mónica Melle Hernández</td>
</tr>
<tr>
<td>181/2003</td>
<td>The Euro effect on the integration of the European stock markets.</td>
<td>Mónica Melle Hernández</td>
</tr>
<tr>
<td>182/2004</td>
<td>In search of complementarity in the innovation strategy: international R&amp;D and external knowledge acquisition.</td>
<td>Bruno Cassiman, Reinhilde Veugelers</td>
</tr>
<tr>
<td>183/2004</td>
<td>Fijación de precios en el sector público: una aplicación para el servicio municipal de suministro de agua.</td>
<td>Mª Ángeles García Valiñas</td>
</tr>
<tr>
<td>184/2004</td>
<td>Estimación de la economía sumergida en España: un modelo estructural de variables latentes.</td>
<td>Ángel Alañón Pardo, Miguel Gómez de Antonio</td>
</tr>
<tr>
<td>185/2004</td>
<td>Causas políticas y consecuencias sociales de la corrupción.</td>
<td>Joan Oriol Prats Cabrera</td>
</tr>
<tr>
<td>186/2004</td>
<td>Loan bankers’ decisions and sensitivity to the audit report using the belief revision model.</td>
<td>Andrés Guiral Contreras and José A. Gonzalo Angulo</td>
</tr>
<tr>
<td>187/2004</td>
<td>El modelo de Black, Derman y Toy en la práctica. Aplicación al mercado español.</td>
<td>Marta Tolentino García-Abadillo y Antonio Díaz Pérez</td>
</tr>
<tr>
<td>188/2004</td>
<td>Does market competition make banks perform well?.</td>
<td>Mónica Melle</td>
</tr>
<tr>
<td>189/2004</td>
<td>Efficiency differences among banks: external, technical, internal, and managerial</td>
<td>Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso</td>
</tr>
</tbody>
</table>
190/2004  Una aproximación al análisis de los costes de la esquizofrenia en España: los modelos jerárquicos bayesianos  
F. J. Vázquez-Polo, M. A. Negrín, J. M. Cavasés, E. Sánchez y grupo RIRAG

191/2004  Environmental proactivity and business performance: an empirical analysis  
Javier González-Benito y Óscar González-Benito

192/2004  Economic risk to beneficiaries in national defined contribution accounts (NDCs)  
Carlos Vidal-Meliá, Inmaculada Domínguez-Fabian y José Enrique Devesa-Carpio

193/2004  Sources of efficiency gains in port reform: non parametric malmquist decomposition tfp index for Mexico  
Antonio Estache, Beatriz Tovar de la Fé y Lourdes Trujillo

194/2004  Persistencia de resultados en los fondos de inversión españoles  
Alfredo Ciriaco Fernández y Rafael Santamaría Aquilué

195/2005  El modelo de revisión de creencias como aproximación psicológica a la formación del juicio del auditor sobre la gestión continuada  
Andrés Guiral Contreras y Francisco Esteso Sánchez

196/2005  La nueva financiación sanitaria en España: descentralización y prospectiva  
David Cantarero Prieto

197/2005  A cointegration analysis of the Long-Run supply response of Spanish agriculture to the common agricultural policy  
José A. Mendez, Ricardo Mora y Carlos San Juan

198/2005  ¿Refleja la estructura temporal de los tipos de interés del mercado español preferencia por la liquidez?  
Magdalena Massot Perelló y Juan M. Nave

199/2005  Análisis de impacto de los Fondos Estructurales Europeos recibidos por una economía regional: Un enfoque a través de Matrices de Contabilidad Social  
M. Carmen Lima y M. Alejandro Cardenete

200/2005  Does the development of non-cash payments affect monetary policy transmission?  
Santiago Carbó Valverde y Rafael López del Paso

201/2005  Firm and time varying technical and allocative efficiency: an application for port cargo handling firms  
Ana Rodríguez-Álvarez, Beatriz Tovar de la Fé y Lourdes Trujillo

202/2005  Contractual complexity in strategic alliances  
Jeffrey J. Reuer y Africa Ariño

203/2005  Factores determinantes de la evolución del empleo en las empresas adquiridas por opa  
Nuria Alcalde Fradejas y Inés Pérez-Soba Aguilar

Elena Olmedo, Juan M. Valderas, Ricardo Gimeno and Lorenzo Escot
205/2005 Precio de la tierra con presión urbana: un modelo para España
Esther Decimavilla, Carlos San Juan y Stefan Sperlich

206/2005 Interregional migration in Spain: a semiparametric analysis
Adolfo Maza y José Villaverde

207/2005 Productivity growth in European banking
Carmen Murillo-Melchor, José Manuel Pastor y Emili Tortosa-Ausina

Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso

209/2005 La elasticidad de sustitución intertemporal con preferencias no separables intratemporalmente: los casos de Alemania, España y Francia.
Elena Márquez de la Cruz, Ana R. martínez Cañete y Inés Pérez-Soba Aguilar

210/2005 Contribución de los efectos tamaño, book-to-market y momentum a la valoración de activos: el caso español.
Begoña Font-Belaire y Alfredo Juan Grau-Grau

211/2005 Permanent income, convergence and inequality among countries
José M. Pastor and Lorenzo Serrano

212/2005 The Latin Model of Welfare: Do 'Insertion Contracts' Reduce Long-Term Dependence?
Luis Ayala and Magdalena Rodríguez

213/2005 The effect of geographic expansion on the productivity of Spanish savings banks
Manuel Illueca, José M. Pastor and Emili Tortosa-Ausina

214/2005 Dynamic network interconnection under consumer switching costs
Ángel Luis López Rodríguez

215/2005 La influencia del entorno socioeconómico en la realización de estudios universitarios: una aproximación al caso español en la década de los noventa
Marta Rahona López

216/2005 The valuation of spanish ipos: efficiency analysis
Susana Álvarez Otero

217/2005 On the generation of a regular multi-input multi-output technology using parametric output distance functions
Sergio Perelman and Daniel Santín

218/2005 La gobernanza de los procesos parlamentarios: la organización industrial del congreso de los diputados en España
Gonzalo Caballero Miguez

219/2005 Determinants of bank market structure: Efficiency and political economy variables
Francisco González

220/2005 Agresividad de las órdenes introducidas en el mercado español: estrategias, determinantes y medidas de performance
David Abad Díaz
221/2005 Tendencia post-anuncio de resultados contables: evidencia para el mercado español
Carlos Forner Rodríguez, Joaquín Marhuenda Fructuoso y Sonia Sanabria García

222/2005 Human capital accumulation and geography: empirical evidence in the European Union
Jesús López-Rodriguez, J. Andrés Faíña y Jose Lopez Rodriguez

223/2005 Auditors' Forecasting in Going Concern Decisions: Framing, Confidence and Information Processing
Waymond Rodgers and Andrés Guiral

José Ramón Cancelo de la Torre, J. Andrés Faíña and Jesús López-Rodriguez

225/2005 The effects of ownership structure and board composition on the audit committee activity: Spanish evidence
Carlos Fernández Méndez and Rubén Arrondo García

226/2005 Cross-country determinants of bank income smoothing by managing loan loss provisions
Ana Rosa Fonseca and Francisco González

Alejandro Estellér Moré

228/2005 Region versus Industry effects: volatility transmission
Pilar Soriano Felipe and Francisco J. Climent Diranzo

Daniel Vázquez-Bustelo and Sandra Valle

Alfonso Palacio-Vera

231/2005 Reconciling Sustainability and Discounting in Cost Benefit Analysis: a methodological proposal
M. Carmen Almansa Sáez and Javier Calatrava Requena

232/2005 Can The Excess Of Liquidity Affect The Effectiveness Of The European Monetary Policy?
Santiago Carbó Valverde and Rafael López del Paso

Miguel Angel Barberán Lahuerta

Víctor M. González

Waymond Rodgers, Paul Pavlou and Andres Guiral.

Francisco J. André, M. Alejandro Cardenet e y Carlos Romero.
Santiago Carbó-Valverde, Francisco Rodríguez-Fernández y Gregory F. Udell.

238/2006  Trade Effects Of Monetary Agreements: Evidence For Oecd Countries.  
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano.

Marcos Álvarez-Díaz y Gonzalo Caballero Miguez.

240/2006  La interacción entre el éxito competitivo y las condiciones del mercado doméstico como determinantes de la decisión de exportación en las Pymes.  
Francisco García Pérez.

241/2006  Una estimación de la depreciación del capital humano por sectores, por ocupación y en el tiempo.  
Inés P. Murillo.

Manuel A. Gómez.

Jose Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro y Javier Salinas-Jiménez.

244/2006  Did The European Exchange-Rate Mechanism Contribute To The Integration Of Peripheral Countries?.  
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano.

Marta Pascual and David Cantarero.

Salvador Rojí Ferrari and Ana Gonzalez Marcos.

247/2006  Testing For Structural Breaks In Variance Withadditive Outliers And Measurement Errors.  
Paulo M.M. Rodrigues and Antonio Rubia.

Joaquín Maudos and Juan Fernández de Guevara.

Desiderio Romero Jordán, José Félix Sanz Sanz y César Pérez López.

250/2006  Regional Income Disparities in Europe: What role for location?.  
Jesús López-Rodríguez and J. Andrés Faíña.

251/2006  Funciones abreviadas de bienestar social: Una forma sencilla de simultanear la medición de la eficiencia y la equidad de las políticas de gasto público.  
Nuria Badenes Plá y Daniel Santín González.

252/2006  “The momentum effect in the Spanish stock market: Omitted risk factors or investor behaviour?”.  
Luis Muga and Rafael Santamaria.

253/2006  Dinámica de precios en el mercado español de gasolina: un equilibrio de colusión tácita.  
Jordi Perdiguero García.
José M. Pastor, Empar Pons y Lorenzo Serrano

255/2006 Environmental implications of organic food preferences: an application of the impure public goods model.
Ana María Aldanondo-Ochoa y Carmen Almansa-Sáez

José Félix Sanz-Sanz, Desiderio Romero-Jordán y Santiago Álvarez-García

257/2006 La internacionalización de la empresa manufacturera española: efectos del capital humano genérico y específico.
José López Rodríguez

María Martínez Torres

259/2006 Efficiency and market power in Spanish banking.
Rolf Färe, Shawna Grosskopf y Emili Tortosa-Ausina.

Helena Chuliá y Hipòlit Torró.

José Antonio Ortega.

262/2006 Accidentes de tráfico, víctimas mortales y consumo de alcohol.
José Mª Arranz y Ana I. Gil.

263/2006 Análisis de la Presencia de la Mujer en los Consejos de Administración de las Mil Mayores Empresas Españolas.
Ruth Mateos de Cabo, Lorenzo Escot Mangas y Ricardo Gimeno Nogués.

Ignacio Álvarez Peralta.

Jaime Vallés-Giménez y Anabel Zárate-Marco.

266/2006 Health Human Capital And The Shift From Foraging To Farming.
Paolo Rungo.

Juan Luis Jiménez y Jordi Perdiguero.

Desiderio Romero-Jordán y José Félix Sanz-Sanz.

269/2006 Banking competition, financial dependence and economic growth
Joaquín Maudos y Juan Fernández de Guevara

270/2006 Efficiency, subsidies and environmental adaptation of animal farming under CAP
Werner Kleinhans, Carmen Murillo, Carlos San Juan y Stefan Sperlich
<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>272/2006</td>
<td>Riesgo asimétrico y estrategias de momentum en el mercado de valores español</td>
<td>Luis Muga y Rafael Santamaría</td>
</tr>
<tr>
<td>273/2006</td>
<td>Valoración de capital-riesgo en proyectos de base tecnológica e innovadora a través de la teoría de opciones reales</td>
<td>Gracia Rubio Martín</td>
</tr>
<tr>
<td>274/2006</td>
<td>Capital stock and unemployment: searching for the missing link</td>
<td>Ana Rosa Martínez-Cañete, Elena Mémez de la Cruz, Alfonso Palacío-Vera and Inés Pérez-Soba Aguilar</td>
</tr>
<tr>
<td>275/2006</td>
<td>Study of the influence of the voters’ political culture on vote decision through the simulation of a political competition problem in Spain</td>
<td>Sagrario Lantarón, Isabel Lillo, Mª Dolores López and Javier Rodrigo</td>
</tr>
<tr>
<td>276/2006</td>
<td>Investment and growth in Europe during the Golden Age</td>
<td>Antonio Cubel and Mª Teresa Sanchis</td>
</tr>
<tr>
<td>277/2006</td>
<td>Efectos de vincular la pensión pública a la inversión en cantidad y calidad de hijos en un modelo de equilibrio general</td>
<td>Robert Meneu Gaya</td>
</tr>
<tr>
<td>278/2006</td>
<td>El consumo y la valoración de activos</td>
<td>Elena Márquez y Belén Nieto</td>
</tr>
<tr>
<td>280/2006</td>
<td>Three measures of returns to education: An illustration for the case of Spain</td>
<td>María Arrazola y José de Hevia</td>
</tr>
<tr>
<td>281/2006</td>
<td>Composition of Firms versus Composition of Jobs</td>
<td>Antoni Cunyat</td>
</tr>
<tr>
<td>282/2006</td>
<td>La vocación internacional de un holding tranviario belga: la Compagnie Mutuelle de Tramways, 1895-1918</td>
<td>Alberte Martínez López</td>
</tr>
<tr>
<td>283/2006</td>
<td>Una visión panorámica de las entidades de crédito en España en la última década.</td>
<td>Constantino García Ramos</td>
</tr>
<tr>
<td>285/2006</td>
<td>Los intereses belgas en la red ferroviaria catalana, 1890-1936</td>
<td>Alberte Martínez López</td>
</tr>
<tr>
<td>286/2006</td>
<td>The Governance of Quality: The Case of the Agrifood Brand Names</td>
<td>Marta Fernández Barcala, Manuel González-Díaz y Emmanuel Raynaud</td>
</tr>
<tr>
<td>287/2006</td>
<td>Modelling the role of health status in the transition out of malthusian equilibrium</td>
<td>Paolo Rungo, Luis Currais and Berta Rivera</td>
</tr>
<tr>
<td>288/2006</td>
<td>Industrial Effects of Climate Change Policies through the EU Emissions Trading Scheme</td>
<td>Xavier Labandeira and Miguel Rodríguez</td>
</tr>
</tbody>
</table>
Globalisation and the Composition of Government Spending: An analysis for OECD countries
Norman Gemmell, Richard Kneller and Ismael Sanz

La producción de energía eléctrica en España: Análisis económico de la actividad tras la liberalización del Sector Eléctrico
Fernando Hernández Martínez

Further considerations on the link between adjustment costs and the productivity of R&D investment: evidence for Spain
Desiderio Romero-Jordán, José Félix Sanz-Sanz and Inmaculada Álvarez-Ayuso

Una teoría sobre la contribución de la función de compras al rendimiento empresarial
Javier González Benito

Agility drivers, enablers and outcomes: empirical test of an integrated agile manufacturing model
Daniel Vázquez-Bustelo, Lucía Avella and Esteban Fernández

Testing the parametric vs the semiparametric generalized mixed effects models
Maria José Lombardía and Stefan Sperlich

Nonlinear dynamics in energy futures
Mariano Matilla-García

Estimating Spatial Models By Generalized Maximum Entropy Or How To Get Rid Of W
Esteban Fernández Vázquez, Matías Mayor Fernández and Jorge Rodríguez-Valez

Optimización fiscal en las transmisiones lucrativas: análisis metodológico
Félix Domínguez Barrero

La situación actual de la banca online en España
Francisco José Climent Diranzo y Alexandre Momparler Pechuán

Estrategia competitiva y rendimiento del negocio: el papel mediador de la estrategia y las capacidades productivas
Javier González Benito y Isabel Suárez González

A Parametric Model to Estimate Risk in a Fixed Income Portfolio
Pilar Abad and Sonia Benito

Análisis Empírico de las Preferencias Sociales Respecto del Gasto en Obra Social de las Cajas de Ahorros
Alejandro Esteller-Moré, Jonathan Jorba Jiménez y Albert Solé-Ollé

Assessing the enlargement and deepening of regional trading blocs: The European Union case
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano

¿Es la Franquicia un Medio de Financiación?: Evidencia para el Caso Español
Vanessa Solís Rodríguez y Manuel González Díaz

On the Finite-Sample Biases in Nonparametric Testing for Variance Constancy
Paulo M.M. Rodrigues and Antonio Rubia

Spain is Different: Relative Wages 1989-98
José Antonio Carrasco Gallego

307/2007 La Eficiencia en la Gestión del Riesgo de Crédito en las Cajas de Ahorro Marcelino Martínez Cabrera

308/2007 Optimal environmental policy in transport: unintended effects on consumers' generalized price M. Pilar Socorro and Ofelia Betancor


310/2007 Long-run Regional Population Divergence and Modern Economic Growth in Europe: a Case Study of Spain María Isabel Ayuda, Fernando Collantes and Vicente Pinilla

311/2007 Financial Information effects on the measurement of Commercial Banks’ Efficiency Borja Amor, María T. Tascón and José L. Fanjul

312/2007 Neutralidad e incentivos de las inversiones financieras en el nuevo IRPF Félix Domínguez Barrero

313/2007 The Effects of Corporate Social Responsibility Perceptions on The Valuation of Common Stock Waymond Rodgers, Helen Choy and Andres Guiral-Contreras

314/2007 Country Creditor Rights, Information Sharing and Commercial Banks’ Profitability Persistence across the world Borja Amor, María T. Tascón and José L. Fanjul

315/2007 ¿Es Relevante el Déficit Corriente en una Unión Monetaria? El Caso Español Javier Blanco González y Ignacio del Rosal Fernández

316/2007 The Impact of Credit Rating Announcements on Spanish Corporate Fixed Income Performance: Returns, Yields and Liquidity Pilar Abad, Antonio Díaz and M. Dolores Robles

317/2007 Indicadores de Lealtad al Establecimiento y Formato Comercial Basados en la Distribución del Presupuesto César Augusto Bustos Reyes y Óscar González Benito


319/2007 El Impacto del Coste de Oportunidad de la Actividad Emprendedora en la Intención de los Ciudadanos Europeos de Crear Empresas Luis Miguel Zapico Aldeano

320/2007 Los belgas y los ferrocarriles de vía estrecha en España, 1887-1936 Alberte Martínez López

321/2007 Competición política bipartidista. Estudio geométrico del equilibrio en un caso ponderado Isabel Lillo, Mª Dolores López y Javier Rodrigo

322/2007 Human resource management and environment management systems: an empirical study Mª Concepción López Fernández, Ana Mª Serrano Bedia and Gema García Piqueres
Wood and industrialization. evidence and hypotheses from the case of Spain, 1860-1935. Iñaki Iriarte-Goñi and María Isabel Ayuda Bosque

New evidence on long-run monetary neutrality. J. Cunado, L.A. Gil-Alana and F. Perez de Gracia

Monetary policy and structural changes in the volatility of us interest rates. Juncal Cuñado, Javier Gomez Biscarri and Fernando Perez de Gracia

The productivity effects of intrafirm diffusion. Lucio Fuentelsaz, Jaime Gómez and Sergio Palomas

Unemployment duration, layoffs and competing risks. J.M. Arranz, C. García-Serrano and L. Toharia

El grado de cobertura del gasto público en España respecto a la UE-15 Nuria Rueda, Begoña Barruso, Carmen Calderón y Mª del Mar Herrador

The Impact of Direct Subsidies in Spain before and after the CAP’92 Reform Carmen Murillo, Carlos San Juan and Stefan Sperlich

Determinants of post-privatisation performance of Spanish divested firms Laura Cabeza García and Silvia Gómez Ansón

¿Por qué deciden diversificar las empresas españolas? Razones oportunistas versus razones económicas Almudena Martínez Campillo

Dynamical Hierarchical Tree in Currency Markets Juan Gabriel Brida, David Matesanz Gómez and Wiston Adrián Risso

Los determinantes sociodemográficos del gasto sanitario. Análisis con microdatos individuales Ana María Angulo, Ramón Barberán, Pilar Egea y Jesús Mur

Why do companies go private? The Spanish case Inés Pérez-Soba Aguilar

The use of gis to study transport for disabled people Verónica Cañal Fernández

The long run consequences of M&A: An empirical application Cristina Bernad, Lucio Fuentelsaz and Jaime Gómez

Las clasificaciones de materias en economía: principios para el desarrollo de una nueva clasificación Valentín Edo Hernández

Reforming Taxes and Improving Health: A Revenue-Neutral Tax Reform to Eliminate Medical and Pharmaceutical VAT Santiago Álvarez-García, Carlos Pestana Barros y Juan Prieto-Rodríguez

Impacts of an iron and steel plant on residential property values Celia Bilbao-Terol

Firm size and capital structure: Evidence using dynamic panel data Víctor M. González and Francisco González
¿Cómo organizar una cadena hotelera? La elección de la forma de gobierno
Marta Fernández Barcala y Manuel González Díaz

Análisis de los efectos de la decisión de diversificar: un contraste del marco teórico “Agencia-Stewardship”
Almudena Martínez Campillo y Roberto Fernández Gago

Selecting portfolios given multiple eurostoxx-based uncertainty scenarios: a stochastic goal programming approach from fuzzy betas
Enrique Ballestero, Blanca Pérez-Gladish, Mar Arenas-Parra and Amelia Bilbao-Terol

“El bienestar de los inmigrantes y los factores implicados en la decisión de emigrar”
Anastasia Hernández Alemán y Carmelo J. León

Andrea Martínez-Noya and Esteban García-Canal

Diferencias salariales entre empresas públicas y privadas. El caso español
Begoña Cueto y Nuria Sánchez- Sánchez

Effects of Fiscal Treatments of Second Home Ownership on Renting Supply
Celia Bilbao Terol and Juan Prieto Rodríguez

Auditors’ ethical dilemmas in the going concern evaluation
Andres Guiral, Waymond Rodgers, Emiliano Ruiz and Jose A. Gonzalo

Convergencia en capital humano en España. Un análisis regional para el periodo 1970-2004
Susana Morales Sequera y Carmen Pérez Esparrells

Socially responsible investment: mutual funds portfolio selection using fuzzy multiobjective programming
Blanca Mª Pérez-Gladish, Mar Arenas-Parra, Amelia Bilbao-Terol and Mª Victoria Rodriguez-Uría

Persistencia del resultado contable y sus componentes: implicaciones de la medida de ajustes por devengo
Raúl Iñiguez Sánchez y Francisco Poveda Fuentes

Wage Inequality and Globalisation: What can we Learn from the Past? A General Equilibrium Approach
Concha Betrán, Javier Ferri and Maria A. Pons

Eficacia de los incentivos fiscales a la inversión en I+D en España en los años noventa
Desiderio Romero Jordán y José Félix Sanz Sanz

Convergencia regional en renta y bienestar en España
Robert Meneu Gaya

Tributación ambiental: Estado de la Cuestión y Experiencia en España
Ana Carrera Poncela

Salient features of dependence in daily us stock market indices
Luis A. Gil-Alana, Juncal Cuñado and Fernando Pérez de Gracia

La educación superior: ¿un gasto o una inversión rentable para el sector público?
Inés P. Murillo y Francisco Pedraja
375/2008 A Revenue-Neutral Tax Reform to Increase Demand for Public Transport Services
Carlos Pestana Barros and Juan Prieto-Rodriguez

376/2008 Measurement of intra-distribution dynamics: An application of different approaches to the European regions
Adolfo Maza, María Hierro and José Villaverde

377/2008 Migración interna de extranjeros y ¿nueva fase en la convergencia?
María Hierro y Adolfo Maza

378/2008 Efectos de la Reforma del Sector Eléctrico: Modelización Teórica y Experiencia Internacional
Ciro Eduardo Bazán Navarro

379/2008 A Non-Parametric Independence Test Using Permutation Entropy
Mariano Matilla-García and Manuel Ruiz Marín

380/2008 Testing for the General Fractional Unit Root Hypothesis in the Time Domain
Uwe Hassler, Paulo M.M. Rodrigues and Antonio Rubia

381/2008 Multivariate gram-charlier densities
Esther B. Del Brio, Trino-Manuel Ñíguez and Javier Perote

382/2008 Analyzing Semiparametrically the Trends in the Gender Pay Gap - The Example of Spain
Ignacio Moral-Arce, Stefan Sperlich, Ana I. Fernández-Sainz and Maria J. Roca

383/2008 A Cost-Benefit Analysis of a Two-Sided Card Market
Santiago Carbó Valverde, David B. Humphrey, José Manuel Liñares Zegarra and Francisco Rodríguez Fernandez

384/2008 A Fuzzy Bicriteria Approach for Journal Deselection in a Hospital Library
M. L. López-Avello, M. V. Rodríguez-Uría, B. Pérez-Gladish, A. Bilbao-Terol, M. Arenas-Parra

385/2008 Valoración de las grandes corporaciones farmaceúticas, a través del análisis de sus principales intangibles, con el método de opciones reales
Gracia Rubio Martín y Prosper Lamothe Fernández

386/2008 El marketing interno como impulsor de las habilidades comerciales de las pymes españolas: efectos en los resultados empresariales
Mª Leticia Santos Vijande, Mª José Sanzo Pérez, Nuria García Rodríguez y Juan A. Trespalacios Gutiérrez

387/2008 Understanding Warrants Pricing: A case study of the financial market in Spain
David Abad y Belén Nieto

388/2008 Aglomeración espacial, Potencial de Mercado y Geografía Económica: Una revisión de la literatura
Jesús López-Rodríguez y J. Andrés Faíña

389/2008 An empirical assessment of the impact of switching costs and first mover advantages on firm performance
Jaime Gómez, Juan Pablo Maícas

390/2008 Tender offers in Spain: testing the wave
Ana R. Martínez-Cañete y Inés Pérez-Soba Aguilar
<table>
<thead>
<tr>
<th>Ano</th>
<th>Título</th>
<th>Autor(es)</th>
</tr>
</thead>
<tbody>
<tr>
<td>391/2008</td>
<td>La integración del mercado español a finales del siglo XIX: los precios del trigo entre 1891 y 1905</td>
<td>Mariano Matilla García, Pedro Pérez Pascual y Basilio Sanz Carnero</td>
</tr>
<tr>
<td>392/2008</td>
<td>Cuando el tamaño importa: estudio sobre la influencia de los sujetos políticos en la balanza de bienes y servicios</td>
<td>Alfonso Echazarra de Gregorio</td>
</tr>
<tr>
<td>393/2008</td>
<td>Una visión cooperativa de las medidas ante el posible daño ambiental de la desalación</td>
<td>Borja Montañño Sanz</td>
</tr>
<tr>
<td>394/2008</td>
<td>Efectos externos del endeudamiento sobre la calificación crediticia de las Comunidades Autónomas</td>
<td>Andrés Leal Marcos y Julio López Laborda</td>
</tr>
<tr>
<td>395/2008</td>
<td>Technical efficiency and productivity changes in Spanish airports: A parametric distance functions approach</td>
<td>Beatriz Tovar &amp; Roberto Rendeiro Martín-Cejas</td>
</tr>
<tr>
<td>396/2008</td>
<td>Network analysis of exchange data: Interdependence drives crisis contagion</td>
<td>David Matesanz Gómez &amp; Guillermo J. Ortega</td>
</tr>
<tr>
<td>397/2008</td>
<td>Explaining the performance of Spanish privatised firms: a panel data approach</td>
<td>Laura Cabeza García and Silvia Gomez Anson</td>
</tr>
<tr>
<td>398/2008</td>
<td>Technological capabilities and the decision to outsource R&amp;D services</td>
<td>Andrea Martínez-Noya and Esteban García-Canal</td>
</tr>
<tr>
<td>399/2008</td>
<td>Hybrid Risk Adjustment for Pharmaceutical Benefits</td>
<td>Manuel García-Goñi, Pere Ibern &amp; José Maria Inoriza</td>
</tr>
<tr>
<td>400/2008</td>
<td>The Team Consensus–Performance Relationship and the Moderating Role of Team Diversity</td>
<td>José Henrique Dieguez, Javier González-Benito and Jesús Galende</td>
</tr>
<tr>
<td>401/2008</td>
<td>The institutional determinants of CO2 emissions: A computational modelling approach using Artificial Neural Networks and Genetic Programming</td>
<td>Marcos Álvarez-Díaz, Gonzalo Caballero Miguez and Mario Soliño</td>
</tr>
<tr>
<td>402/2008</td>
<td>Alternative Approaches to Include Exogenous Variables in DEA Measures: A Comparison Using Monte Carlo</td>
<td>José Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro and Daniel Santín-González</td>
</tr>
<tr>
<td>403/2008</td>
<td>Efecto diferencial del capital humano en el crecimiento económico andaluz entre 1985 y 2004: comparación con el resto de España</td>
<td>Mª del Pópulo Pablo-Romero Gil-Delgado y Mª de la Palma Gómez-Calero Valdés</td>
</tr>
<tr>
<td>404/2008</td>
<td>Análisis de fusiones, variaciones conjeturales y la falacia del estimator en diferencias</td>
<td>Juan Luis Jiménez y Jordi Perdiguerro</td>
</tr>
<tr>
<td>405/2008</td>
<td>Política fiscal en la uem: ¿basta con los estabilizadores automáticos?</td>
<td>Jorge Uxó González y Mª Jesús Arroyo Fernández</td>
</tr>
<tr>
<td>406/2008</td>
<td>Papel de la orientación emprendedora y la orientación al mercado en el éxito de las empresas</td>
<td>Óscar González-Benito, Javier González-Benito y Pablo A. Muñoz-Gallego</td>
</tr>
<tr>
<td>407/2008</td>
<td>La presión fiscal por impuesto sobre sociedades en la unión europea</td>
<td>Elena Fernández Rodríguez, Antonio Martínez Arias y Santiago Álvarez García</td>
</tr>
</tbody>
</table>
408/2008 The environment as a determinant factor of the purchasing and supply strategy: an empirical analysis
Dr. Javier González-Benito and MS Duilio Reis da Rocha

409/2008 Cooperation for innovation: the impact on innovatory effort
Gloria Sánchez González and Liliana Herrera

410/2008 Spanish post-earnings announcement drift and behavioral finance models
Carlos Forner and Sonia Sanabria

411/2008 Decision taking with external pressure: evidence on football manager dismissals in Argentina and their consequences
Ramón Flores, David Forrest and Juan de Dios Tena

Raúl Serrano and Vicente Pinilla

413/2008 Voter heuristics in Spain: a descriptive approach to the electorate's decision
José Luis Sáez Lozano and Antonio M. Jaime Castillo

414/2008 Análisis del efecto área de salud de residencia sobre la utilización y acceso a los servicios sanitarios en la Comunidad Autónoma Canaria
Ignacio Abásolo Alessón, Lidia García Pérez, Raquel Aguiar Ibáñez and Asier Amador Robayna

415/2008 Impact on competitive balance from allowing foreign players in a sports league: an analytical model and an empirical test
Ramón Flores, David Forrest & Juan de Dios Tena

416/2008 Organizational innovation and productivity growth: Assessing the impact of outsourcing on firm performance
Alberto López

417/2008 Value Efficiency Analysis of Health Systems
Eduardo González, Ana Cárcaba & Juan Ventura

418/2008 Equidad en la utilización de servicios sanitarios públicos por comunidades autónomas en España: un análisis multinivel
Ignacio Abásolo, Jaime Pinilla, Miguel Negrín, Raquel Aguiar y Lidia García

419/2008 Piedras en el camino hacia Bolonia: efectos de la implantación del EEES sobre los resultados académicos
Carmen Florido, Juan Luis Jiménez e Isabel Santana

420/2008 The welfare effects of the allocation of airlines to different terminals
M. Pilar Socorro and Ofelia Betancor

421/2008 How bank capital buffers vary across countries. The influence of cost of deposits, market power and bank regulation
Ana Rosa Fonseca and Francisco González

422/2008 Analysing health limitations in Spain: an empirical approach based on the European Community household panel
Marta Pascual and David Cantarero
<table>
<thead>
<tr>
<th>Year</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>Regional productivity variation and the impact of public capital stock: an analysis with spatial interaction, with reference to Spain</td>
<td>Miguel Gómez-Antonio and Bernard Fingleton</td>
</tr>
<tr>
<td>2008</td>
<td>Average effect of training programs on the time needed to find a job. The case of the training schools program in the south of Spain (Seville, 1997-1999).</td>
<td>José Manuel Cansino Muñoz-Repiso and Antonio Sánchez Braza</td>
</tr>
<tr>
<td>2008</td>
<td>Medición de la eficiencia y cambio en la productividad de las empresas distribuidoras de electricidad en Perú después de las reformas</td>
<td>Raúl Pérez-Reyes y Beatriz Tovar</td>
</tr>
<tr>
<td>2008</td>
<td>Acercando posturas sobre el descuento ambiental: sondeo Delphi a expertos en el ámbito internacional</td>
<td>Carmen Almansa Sáez y José Miguel Martínez Paz</td>
</tr>
<tr>
<td>2008</td>
<td>Determinants of abnormal liquidity after rating actions in the Corporate Debt Market</td>
<td>Pilar Abad, Antonio Díaz and M. Dolores Robles</td>
</tr>
<tr>
<td>2008</td>
<td>Export led-growth and balance of payments constrained. New formalization applied to Cuban commercial regimes since 1960</td>
<td>David Matesanz Gómez, Guadalupe Fugarolas Álvarez-Ude and Isis Mañalich Gálvez</td>
</tr>
<tr>
<td>2008</td>
<td>La deuda implícita y el desequilibrio financiero-actuarial de un sistema de pensiones. El caso del régimen general de la seguridad social en España</td>
<td>José Enrique Devesa Carpio y Mar Devesa Carpio</td>
</tr>
<tr>
<td>2008</td>
<td>Efectos de la descentralización fiscal sobre el precio de los carburantes en España</td>
<td>Desiderio Romero Jordán, Marta Jorge García-Inés y Santiago Álvarez García</td>
</tr>
<tr>
<td>2008</td>
<td>Does social spending increase support for free trade in advanced democracies?</td>
<td>Ismael Sanz, Ferran Martínez i Coma and Federico Steinberg</td>
</tr>
<tr>
<td>2008</td>
<td>Potencial de Mercado y Estructura Espacial de Salarios: El Caso de Colombia</td>
<td>Jesús López-Rodríguez y María Cecilia Acevedo</td>
</tr>
<tr>
<td>2008</td>
<td>Persistence in Some Energy Futures Markets</td>
<td>Juncal Cunado, Luis A. Gil-Alana and Fernando Pérez de Gracia</td>
</tr>
<tr>
<td>2008</td>
<td>La inserción financiera externa de la economía francesa: inversores institucionales y nueva gestión empresarial</td>
<td>Ignacio Álvarez Peralta</td>
</tr>
<tr>
<td>2008</td>
<td>¿Flexibilidad o rigidez salarial en España?: un análisis a escala regional</td>
<td>Ignacio Moral Arce y Adolfo Maza Fernández</td>
</tr>
<tr>
<td>2008</td>
<td>Friendly or Controlling Boards?</td>
<td>Pablo de Andrés Alonso &amp; Juan Antonio Rodríguez Sanz</td>
</tr>
</tbody>
</table>
La sociedad Trenor y Cía. (1838-1926): un modelo de negocio industrial en la España del siglo XIX
Amparo Ruiz Llopis

Continental bias in trade
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez Serrano

Determining operational capital at risk: an empirical application to the retail banking
Enrique José Jiménez-Rodríguez, José Manuel Feria-Dominguez & José Luis Martín-Marín

Costes de mitigación y escenarios post-kyoto en España: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino

Las revistas españolas de economía en las bibliotecas universitarias: ranking, valoración del indicador y del sistema
Valentín Edo Hernández

Convergencia económica en España y coordinación de políticas económicas. un estudio basado en la estructura productiva de las CC.AA.
Ana Cristina Mingorance Arnáiz

Instrumentos de mercado para reducir emisiones de co2: un análisis de equilibrio general para España
Mikel González Ruiz de Eguino

El comercio intra e inter-regional del sector Turismo en España
Carlos Llano y Tamara de la Mata

Efectos del incremento del precio del petróleo en la economía española: Análisis de cointegración y de la política monetaria mediante reglas de Taylor
Fernando Hernández Martínez

Bologna Process and Expenditure on Higher Education: A Convergence Analysis of the EU-15
T. Agasisti, C. Pérez Esparrells, G. Catalano & S. Morales

Global Economy Dynamics? Panel Data Approach to Spillover Effects
Gregory Daco, Fernando Hernández Martínez & Li-Wu Hsu

Pricing levered warrants with dilution using observable variables
Isabel Abínzano & Javier F. Navas

Information technologies and financial performance: The effect of technology diffusion among competitors
Lucio Fuentelsaz, Jaime Gómez & Sergio Palomas

A Detailed Comparison of Value at Risk in International Stock Exchanges
Pilar Abad & Sonia Benito

Understanding offshoring: has Spain been an offshoring location in the nineties?
Belén González-Díaz & Rosario Gandoy

Outsourcing decision, product innovation and the spatial dimension: Evidence from the Spanish footwear industry
José Antonio Belso-Martínez
Does playing several competitions influence a team’s league performance? Evidence from Spanish professional football
Andrés J. Picazo-Tadeo & Francisco González-Gómez

Does accessibility affect retail prices and competition? An empirical application
Juan Luis Jiménez and Jordi Perdiguero

Cash conversion cycle in smes
Sonia Baños-Caballero, Pedro J. García-Teruel and Pedro Martínez-Solano

Un estudio sobre el perfil de hogares endeudados y sobreendeudados: el caso de los hogares vascos
Alazne Mujika Alberdi, Iñaki García Arrizabalaga y Juan José Gibaja Martins

Imposing monotonicity on outputs in parametric distance function estimations: with an application to the spanish educational production
Sergio Perelman and Daniel Santín

Key issues when using tax data for concentration analysis: an application to the Spanish wealth tax
José Mª Durán-Cabré and Alejandro Esteller-Moré

¿Se está rompiendo el mercado español? Una aplicación del enfoque de feldstein –horioka
Saúl De Vicente Queijeiro, José Luis Pérez Rivero y María Rosalía Vicente Cuervo

Financial condition, cost efficiency and the quality of local public services
Manuel A. Muñiz & José L. Zafra

Including non-cognitive outputs in a multidimensional evaluation of education production: an international comparison
Marián García Valiñas & Manuel Antonio Muñiz Pérez

A political look into budget deficits. The role of minority governments and oppositions
Albert Falcó-Gimeno & Ignacio Jurado

La simulación del cuadro de mando integral. Una herramienta de aprendizaje en la materia de contabilidad de gestión
Elena Urquía Grande, Clara Isabel Muñoz Colomina y Elisa Isabel Cano Montero

Análisis histórico de la importancia de la industria de la desalinización en España
Borja Montaño Sanz

The dynamics of trade and innovation: a joint approach
Silviano Esteve-Pérez & Diego Rodríguez

Measuring international reference-cycles
Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & Mª Jesús Delgado Rodríguez

Measuring quality of life in Spanish municipalities
Eduardo González Fidalgo, Ana Cárceba García, Juan Ventura Victoria & Jesús García García

¿Cómo se valoran las acciones españolas: en el mercado de capitales doméstico o en el europeo?
Begoña Font Belaire y Alfredo Juan Grau Grau

Patterns of e-commerce adoption and intensity. evidence for the european union-27
María Rosalía Vicente & Ana Jesús López
On measuring the effect of demand uncertainty on costs: an application to port terminals
Ana Rodriguez-Álvarez, Beatriz Tovar & Alan Wall

Order of market entry, market and technological evolution and firm competitive performance
Jaime Gómez, Gianvito Lanzolla & Juan Pablo Maicas

La Unión Económica y Monetaria Europea en el proceso exportador de Castilla y León (1993-2007): un análisis de datos de panel
Almudena Martínez Campillo y Mª del Pilar Sierra Fernández

Do process innovations boost SMEs productivity growth?
Juan A. Mañez, María E. Rochina Barrachina, Amparo Sanchis Llopis & Juan A. Sanchis Llopis

Incertidumbre externa y elección del modo de entrada en el marco de la inversión directa en el exterior
Cristina López Duarte y Marta Mª Vidal Suárez

Testing for structural breaks in factor loadings: an application to international business cycle
José Luis Cendejas Bueno, Sonia de Lucas Santos, Inmaculada Álvarez Ayuso & Mª Jesús Delgado Rodríguez

¿Esconde la rigidez de precios la existencia de colusión? El caso del mercado de carburantes en las Islas Canarias
Juan Luis Jiménez y Jordi Perdiguero

The poni test with structural breaks
Antonio Aznar & María-Isabel Ayuda

Accuracy and reliability of Spanish regional accounts (CRE-95)
Verónica Cañal Fernández

Estimating regional variations of R&D effects on productivity growth by entropy econometrics
Esteban Fernández-Vázquez y Fernando Rubiera-Morellón

Why do local governments privatize the provision of water services? Empirical evidence from Spain
Francisco González-Gómez, Andrés J. Picazo-Tadeo & Jorge Guardiola

Assessing the regional digital divide across the European Union-27
María Rosalia Vicente & Ana Jesús López

Measuring educational efficiency and its determinants in Spain with parametric distance functions
José Manuel Cordero Ferrera, Eva Crespo Cebada & Daniel Santín González

Spatial analysis of public employment services in the Spanish provinces
Patricia Suárez Cano & Matías Mayor Fernández

Trade effects of continental and intercontinental preferential trade agreements
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez-Serrano

Testing the accuracy of DEA for measuring efficiency in education under endogeneity
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez-Serrano

Measuring efficiency in primary health care: the effect of exogenous variables on results
José Manuel Cordero Ferrera, Éva Crespo Cebada & Luis R. Murillo Zamorano
489/2009 Capital structure determinants in growth firms accessing venture funding
Marina Balboa, José Martí & Álvaro Tresierra

490/2009 Determinants of debt maturity structure across firm size
Víctor M. González

491/2009 Análisis del efecto de la aplicación de las NIIF en la valoración de las salidas a bolsa
Susana Álvarez Otero y Eduardo Rodríguez Enríquez

492/2009 An analysis of urban size and territorial location effects on employment probabilities: the spanish case
Ana Viñuela-Jiménez, Fernando Rubiera-Morollón & Begoña Cueto

493/2010 Determinantes de la estructura de los consejos de administración en España
Isabel Acero Fraile y Nuria Alcalde Fradejas

494/2010 Performance and completeness in repeated inter-firm relationships: the case of franchising
Vanesa Solis-Rodriguez & Manuel Gonzalez-Diaz

495/2010 A Revenue-Based Frontier Measure of Banking Competition
Santiago Carbó, David Humphrey & Francisco Rodríguez

496/2010 Categorical segregation in social networks
Antoni Rubí-Barceló

497/2010 Beneficios ambientales no comerciales de la directiva marco del agua en condiciones de escasez: análisis económico para el Guadalquivir
Julia Martín-Ortega, Giacomo Giannoccaro y Julio Berbel Vecino

498/2010 Monetary integration and risk diversification in eu-15 sovereign debt markets
Juncal Cuñado & Marta Gómez-Puig

José Antonio Carrasco Gallego

500/2010 The role of learning in firm R&D persistence
Juan A. Mañez, María E. Rochina-Barrachina, Amparo Sanchis-Llopis & Juan A. Sanchis-Llopis

501/2010 Is venture capital more than just money?
Marina Balboa, José Martí & Nina Zieling

502/2010 On the effects of supply strategy on business performance: do the relationships among generic competitive objectives matter?
Javier González-Benítez

503/2010 Corporate cash holding and firm value
Cristina Martínez-Sola, Pedro J. García-Teruel & Pedro Martínez-Solano

504/2010 El impuesto de flujos de caja de sociedades: una propuesta de base imponible y su aproximación contable en España
Lourdes Jerez Barroso y Joaquín Texeira Quirós

505/2010 The effect of technological, commercial and human resources on the use of new technology
Jaime Gómez & Pilar Vargas
¿Cómo ha afectado la fiscalidad a la rentabilidad de la inversión en vivienda en España? Un análisis para el periodo 1996 y 2007
Jorge Onrubia Fernández y María del Carmen Rodado Ruiz

Un análisis para el periodo 1996 y 2007
Jorge Onrubia Fernández y María del Carmen Rodado Ruiz

Modelización de flujos en el análisis input-output a partir de la teoría de redes
Ana Salomé García Muñiz

Export-led-growth hypothesis revisited. a balance of payments approach for Argentina, Brazil, Chile and Mexico
David Matesanz Gómez & Guadalupe Fugarolas Álvarez-Ude

Realised hedge ratio properties, performance and implications for risk management: evidence from the spanish ibex 35 spot and futures markets
David G McMillan & Raquel Quiroga García

Do we sack the manager... or is it better not to? Evidence from Spanish professional football
Francisco González-Gómez, Andrés J. Picazo-Tadeo & Miguel Á. García-Rubio

Have Spanish port sector reforms during the last two decades been successful? A cost frontier approach
Ana Rodríguez-Álvarez & Beatriz Tovar

Size & Regional Distribution of Financial Behavior Patterns in Spain
Juan Antonio Maroto Acín, Pablo García Estévez & Salvador Roji Ferrari

The impact of public reforms on the productivity of the Spanish ports: a parametric distance function approach
Ramón Núñez-Sánchez & Pablo Coto-Millán

Trade policy versus institutional trade barriers: an application using “good old” ols
Laura Márquez-Ramos, Inmaculada Martínez-Zarzoso & Celestino Suárez-Burguet

The “Double Market” approach in venture capital and private equity activity: the case of Europe
Marina Balboa & José Martí

International accounting differences and earnings smoothing in the banking industry
Marina Balboa, Germán López-Espinosa & Antonio Rubia

Convergence in car prices among European countries
Simón Sosvilla-Rivero & Salvador Gil-Pareja

Effects of process and product-oriented innovations on employee downsizing
José David Vicente-Lorente & José Ángel Zúñiga-Vicente

Inequality, the politics of redistribution and the tax-mix
Jenny De Freitas

Efectos del desajuste educativo sobre el rendimiento privado de la educación: un análisis para el caso español (1995-2006)
Inés P. Murillo, Marta Rahona y Mª del Mar Salinas

Structural breaks and real convergence in opec countries
Juncal Cuñado

Human Capital, Geographical location and Policy Implications: The case of Romania
Jesús López-Rodríguez, Andrés Faiña y Bolea Cosmin-Gabriel
523/2010 Organizational unlearning context fostering learning for customer capital through time: lessons from SMEs in the telecommunications industry
Anthony K. P. Wensley, Antonio Leal-Millán, Gabriel Cepeda-Carrión & Juan Gabriel Cegarra-Navarro

524/2010 The governance threshold in international trade flows
Marta Felis-Rota

525/2010 The intensive and extensive margins of trade: decomposing exports growth differences across Spanish regions
Asier Minondo Uribe-Etxeberria & Francisco Requena Silvente

526/2010 Why do firms locate R&D outsourcing agreements offshore? the role of ownership, location, and externalization advantages
Andrea Martínez-Noya, Esteban García-Canal & Mauro f. Guillén

527/2010 Corporate Taxation and the Productivity and Investment Performance of Heterogeneous Firms: Evidence from OECD Firm-Level Data
Norman Gemmell, Richard Kneller, Ismael Sanz & José Félix Sanz-Sanz

528/2010 Modelling Personal Income Taxation in Spain: Revenue Elasticities and Regional Comparisons
John Creedy & José Félix Sanz-Sanz

529/2010 Mind the Remoteness!. Income disparities across Japanese Prefectures
Jesús López-Rodríguez , Daisuke Nakamura

530/2010 El nuevo sistema de financiación autonómica: descripción, estimación empírica y evaluación
Antoni Zabalza y Julio López Laborda

531/2010 Markups, bargaining power and offshoring: an empirical assessment
Lourdes Moreno & Diego Rodríguez

532/2010 The snp-dcc model: a new methodology for risk management and forecasting
Esther B. Del Brio, Trino-Manuel Ñíguez & Javier Perote

533/2010 El uso del cuadro de mando integral y del presupuesto en la gestión estratégica de los hospitales públicos
David Naranjo Gil

534/2010 Análisis de la efectividad de las prácticas de trabajo de alta implicación en las fábricas españolas
Daniel Vázquez-Bustelo y Lucía Avella Camarero

535/2010 Energía, innovación y transporte: la electrificación de los tranvías en España, 1896-1935
Alberte Martínez López

536/2010 La ciudad como negocio: gas y empresa en una región española, Galicia 1850-1936
Alberte Martínez López y Jesús Mirás Araujo

537/2010 To anticipate or not to anticipate? A comparative analysis of opportunistic early elections and incumbents’ economic performance
Pedro Riera Sagrera

538/2010 The impact of oil shocks on the Spanish economy
Ana Gómez-Loscos, Antonio Montañés & María Dolores Gadea
The efficiency of public and publicly-subsidized high schools in Spain. Evidence from PISA-2006
María Jesús Mancebón, Jorge Calero, Álvaro Choi & Domingo P. Ximénez-de-Embún

Regulation as a way to force innovation: the biodiesel case
Jordi Perdiguero & Juan Luis Jiménez

Pricing strategies of Spanish network carrier
Xavier Fageda, Juan Luis Jiménez & Jordi Perdiguero

Papel del posicionamiento del distribuidor en la relación entre la marca de distribuidor y lealtad al establecimiento comercial
Oscar González-Benito y Mercedes Martos-Partal

How Bank Market Concentration, Regulation, and Institutions Shape the Real Effects of Banking Crises
Ana I. Fernández, Francisco González & Nuria Suárez

Una estimación del comercio interregional trimestral de bienes en España mediante técnicas de interpolación temporal
Nuria Gallego López, Carlos Llano Verduras y Julián Pérez García

Puerto, empresas y ciudad: una aproximación histórica al caso de Las Palmas de Gran Canaria
Miguel Suárez, Juan Luis Jiménez y Daniel Castillo

Multinationals in the motor vehicles industry: a general equilibrium analysis for a transition economy
Concepción Latorre & Antonio G. Gómez-Plana

Core/periphery scientific collaboration networks among very similar researchers
Antoni Rubí-Barceló

Basic R&D in vertical markets
Miguel González-Maestre & Luis M. Granero

Factores condicionantes de la presión fiscal de las entidades de crédito españolas, ¿existen diferencias entre bancos y cajas de ahorros?
Ana Rosa Fonseca Díaz, Elena Fernández Rodríguez y Antonio Martínez Arias

Analyzing an absorptive capacity: Unlearning context and Information System Capabilities as catalysts for innovativeness
Gabriel Cepeda-Carrión, Juan Gabriel Cegarra-Navarro & Daniel Jimenez-Jimenez

The resolution of banking crises and market discipline: international evidence
Elena Cubillas, Ana Rosa Fonseca & Francisco González

A strategic approach to network value in information markets
Lucio Fuentelsaz, Elisabet Garrido & Juan Pablo Maicas

Accounting for the time pattern of remittances in the Spanish context
Alfonso Echazarra

How to design franchise contracts: the role of contractual hazards and experience
Vanessa Solis-Rodriguez & Manuel Gonzalez-Diaz
555/2010 Una teoría integradora de la función de producción al rendimiento empresarial
Javier González Benito

556/2010 Height and economic development in Spain, 1850-1958
Ramón María-Dolores & José Miguel Martínez-Carrión

557/2010 Why do entrepreneurs use franchising as a financial tool? An agency explanation
Manuel González-Díaz & Vanesa Solís-Rodríguez

558/2010 Explanatory Factors of Urban Water Leakage Rates in Southern Spain
Francisco González-Gómez, Roberto Martínez-Espiñeira, Maria A. García-Valiñas & Miguel Á. García Rubio

559/2010 Los rankings internacionales de las instituciones de educación superior y las clasificaciones universitarias en España: visión panorámica y prospectiva de futuro.
Carmen Pérez-Esparrells y José Mª Gómez-Sancho.

560/2010 Análisis de los determinantes de la transparencia fiscal: Evidencia empírica para los municipios catalanes
Alejandro Esteller Moré y José Polo Otero

561/2010 Diversidad lingüística e inversión exterior: el papel de las barreras lingüísticas en los procesos de adquisición internacional
Cristina López Duarte y Marta Mª Vidal Suárez

562/2010 Costes y beneficios de la competencia fiscal en la Unión Europea y en la España de las autonomías
José Mª Cantos, Agustín García Rico, Mª Gabriela Lagos Rodríguez y Raquel Álamo Cerrillo

563/2010 Customer base management and profitability in information technology industries
Juan Pablo Maicas y Francisco Javier Sese

564/2010 Expansión internacional y distancia cultural: distintas aproximaciones —hofstede, schwartz, globe
Cristina López Duarte y Marta Mª Vidal Suárez

565/2010 Economies of scale and scope in service firms with demand uncertainty: An application to a Spanish port
Beatriz Tovar & Alan Wall

566/2010 Fiscalidad y elección entre renta vitalicia y capital único por los inversores en planes de pensiones: el caso de España
Félix Domínguez Barrero y Julio López Laborda

567/2010 Did the cooperative start life as a joint-stock company? Business law and cooperatives in Spain, 1869–1931
Timothy W. Guinnan & Susana Martínez-Rodriguez

Félix J. López-Iturriaga, Óscar López-de-Foronda & Iván Pastor Sanz

569/2010 Financiación de los cuidados de larga duración en España
Raúl del Pozo Rubio y Francisco Escribano Sotos
570/2010 Is the Border Effect an Artefact of Geographic Aggregation?
Carlos Llano-Verduras, Asier Minondo-Uribe & Francisco Requena-Silvente

571/2010 Notes on using the hidden asset or the contribution asset to compile the actuarial balance for pay-as-you-go pension systems
Carlos Vidal-Meliá & María del Carmen Boado-Penas

572/2010 The Real Effects of Banking Crises: Finance or Asset Allocation Effects? Some International Evidence
Ana I. Fernández, Francisco González & Nuria Suárez Carlos

573/2010 Endogenous mergers of complements with mixed bundling
Ricardo Flores-Fillol & Rafael Moner-Colonques

574/2010 Redistributive Conflicts and Preferences for Tax Schemes in Europe
Antonio M. Jaime-Castillo & Jose L. Saez-Lozano

575/2010 Spanish emigration and the setting-up of a great company in Mexico: bimbo, 1903-2008
Javier Moreno Lázaro

576/2010 Mantenimiento temporal de la equidad horizontal en el sistema de financiación autonómica
Julio López Laborda y Antoni Zabalza

577/2010 Sobreeeducación, Educación no formal y Salarios: Evidencia para España
Sandra Nieto y Raúl Ramos

578/2010 Dependencia y empleo: un análisis empírico con la encuesta de discapacidades y atención a la dependencia (edad) 2008.
David Cantarero-Prieto y Patricia Moreno-Mencia

579/2011 Environment and happiness: new evidence for Spain
Juncal Cuñado & Fernando Pérez de Gracia

580/2011 Analysis of emerging barriers for e-learning models. a case of study
Nuria Calvo & Paolo Rungo

581/2011 Unemployment, cycle and gender
Amado Peiró, Jorge Belaire-Franch, & Maria Teresa Gonzalo

Ana Viñuela Jiménez & Fernando Rubiera Morollón

583/2011 The Efficiency of Performance-based-fee Funds
Ana C. Díaz-Mendoza, Germán López-Espinosa & Miguel A. Martínez-Sedano

584/2011 Green and good?. The investment performance of US environmental mutual funds
Francisco J. Climent-Diranzo & Pilar Soriano-Felipe

585/2011 El fracaso de Copenhague desde la teoría de juegos.
Yolanda Fernández Fernández, Mª Angeles Fernández López y Blanca Olmedillas Blanco

586/2011 Tie me up, tie me down! the interplay of the unemployment compensation system, fixed-term contracts and rehirings
José M. Arranz & Carlos García-Serrano
587/2011 Corporate social performance, innovation intensity and their impacts on financial performance: evidence from lending decisions
Andrés Guiral

588/2011 Assessment of the programme of measures for coastal lagoon environmental restoration using cost-benefit analysis.
José Miguel Martínez Paz & Ángel Perni Llorente

589/2011 Illicit drug use and labour force participation: a simultaneous equations approach
Berta Rivera, Bruno Casal, Luis Currais & Paolo Rungo

590/2011 Influencia de la propiedad y el control en la puesta en práctica de la rsc en las grandes empresas españolas
José-Luis Godos-Diez, Roberto Fernández-Gago y Laura Cabeza-García

591/2011 Ownership, incentives and hospitals
Xavier Fageda & Eva Fiz

592/2011 La liberalización del ferrocarril de mercancías en europa: ¿éxito o fracaso?
Daniel Albalate del Sol, Maria Lluïsa Sort García y Universitat de Barcelona

593/2011 Do nonreciprocal preference regimes increase exports?
Salvador Gil-Pareja, Rafael Llorca-Vivero & José Antonio Martínez-Serrano

594/2011 Towards a dynamic analysis of multiple-store shopping: evidence from Spanish panel data
Noemí Martínez-Caraballo, Manuel Salvador, Carmen Berné & Pilar Gargallo

595/2011 Base imponible y neutralidad del impuesto de sociedades: alternativas y experiencias
Lourdes Jerez Barroso

596/2011 Cambio técnico y modelo de negocio: las compañías de transporte urbano en España, 1871-1989
Alberte Martínez López

597/2011 A modified dickey-fuller procedure to test for stationarity
Antonio Aznar, María-Isabel Ayuda

598/2011 Entorno institucional, estructura de propiedad e inversión en I+D: Un análisis internacional
Félix J. López Iturriaga y Emilio J. López Millán

599/2011 Factores competitivos y oferta potencial del sector lechero en Navarra
Valero L. Casasnovas Oliva y Ana M. Aldanondo Ochoa

600/2011 Política aeroportuaria y su impacto sobre la calidad percibida de los aeropuertos
Juan Luis Jiménez y Ancor Suárez

601/2011 Regímenes de tipo de cambio y crecimiento económico en países en desarrollo
Elena Lasarte Navamuel y José Luis Pérez Rivero

602/2011 La supervivencia en las empresas de alta tecnología españolas: análisis del sector investigación y desarrollo
Evangelina Baltar Salgado, Sara Fernández López, Isabel Neira Gómez y Milagros Vivel Búa

603/2011 Análisis económico y de rentabilidad del sistema financiero español, por tipo de entidades y tamaño, después de cuatro años de crisis y ante los retos de la reestructuración financiera
Salvador Climent Serrano
Does competition affect the price of water services? Evidence from Spain
Germà Bel, Francisco González-Gómez & Andrés J Picazo-Tadeo

The Effects of Remoteness in Japanese Educational Levels
Jesús López-Rodríguez & Daisuke Nakamura

The money market under information asymmetries and imperfectly competitive loan and deposit markets
Aday Hernández

The effects of airline and high speed train integration
M. Pilar Socorro & M. Fernanda Viecens

Consecuencias de la imbricación de los clientes en la dirección medioambiental: un análisis empírico
Jesús Ángel del Brío González, Esteban Fernández Sánchez y Beatriz Junquera Cimadevilla

Revenue autonomy and regional growth: an analysis for the 25 year-process of fiscal decentralisation in Spain
Ramiro Gil-Serrate, Julio López-Laborda & Jesús Mur

The accessibility to employment offices in the Spanish labor market: Implications in terms of registered unemployment
Patricia Suárez, Matías Mayor & Begoña Cueto

Time-varying integration in European government bond markets
Pilar Abad, Helena Chuliá & Marta Gómez-Puig

Production networks and EU enlargement: is there room for everyone in the automotive industry?
Leticia Blázquez, Carmen Díaz-Mora & Rosario Gandoy

Los factores pronóstico económico, estructura productiva y capacidad de innovar en la valoración de activos españoles
Mª Begoña Font Belaire y Alfredo Juan Grau Grau

Capital structure adjustment process in firms accessing venture funding
Marina Balboa, José Martí & Álvaro Tresierra