Socioemotional wealth, generations and venture capital involvement in family-controlled businesses

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Abstract

In this paper we analyze how the will to protect socioemotional wealth affects venture capital (VC) involvement in family-controlled businesses (FCBs). We find that first generation FCBs receiving VC show significantly lower productivity growth than other investees prior to the initial VC investment. We argue that the higher reluctance to lose control in first generation FCBs explains why only those that are not performing well are willing to accept an external investor as new shareholder. We also find, however, that the impact of VC financing on productivity growth is higher in first generation FCBs than in other investees. Since managers' entrepreneurial orientation decreases over time, the effect of VC involvement is more limited in second or following generation FCBs.

Keywords*:* socioemotional wealth, venture capital, family firms, generations, productivity, entrepreneurial orientation

JEL Classification: G24, D24, M13, C23

EFMA codes: 810, 110, 150

1. Introduction

Venture capital (hereinafter, VC) institutions are considered as specialized investors able to reduce information asymmetries (Chan, 1983; Scholes et al., 2010, among others) and to renew the entrepreneurial orientation of the investee firm (Cruz & Nordqvist, 2012; Wright et al., 2009). They provide value-adding services to their investee firms in addition to funding (Croce et al. 2010). The impact of VC involvement in their investee firms has already been addressed in the literature from different perspectives (Alemany & Marti, 2005; Chemmanur et al., 2011; Croce et al., 2010 Hellman & Puri, 2002, among others). With a few exceptions (Howorth et al., 2007; Martí et al., 2010; Wright et al., 2009), however, the study of VC investments in family firms has been neglected. Even though family-controlled businesses (hereinafter, FCBs) are the prevailing form of enterprise in continental Europe (Faccio & Lang, 2002), they are underrepresented in the portfolios of VC firms (Martí et al., 2010). This could be one of the reasons explaining the limited attention FCBs have received in the VC literature. In addition, the extant literature has scarcely analyzed the effect of VC involvement in FCBs across generations.

There is ample discussion in the family business literature about the performance of FCBs across generations, but the results are mixed. Recent studies report the existence of non-economic factors influencing managerial decisions, introducing the concept of socioemotional wealth (SEW) of ownership for the family (Gómez-Mejía et al, 2007; Gómez-Mejía et al., 2011; Wright & Kellermanns, 2011). The fear of losing the SEW may convert the positive influence of familiness in a weakness due to the lack of entrepreneurial orientation (Gómez-Mejía et al., 2007). The desire to protect SEW may also harm the strategic positioning of the FCB over time, since their managers would be reluctant to carry out the investments required to enhance the company's competitive edge.

The desire to protect SEW may reduce the incentive to accept a VC investor as shareholder in FCBs. Since the reluctance to accept external investors is higher in first generation FCBs (Gómez-Mejía et al., 2007), we aim to analyze why those companies approach VC investors at that stage. In addition, we also aim to analyze to what extent the effect of VC involvement is significantly different depending on the generation in which the investee firm receives VC funding.

The empirical analyses are carried out on a large representative sample of Spanish family and non-family businesses that received VC funding between 1995 and 2005, also considering in FCBs the generation in which they received this treatment.

This paper contributes to the family business literature in different ways. First, we provide further evidence on how the desire to protect SEW is highest in first generation FCBs. Second, our paper provides new evidence on whether and how VC funding positively influences investee FCB's performance. Third, it provides additional evidence on the discussion about performance of FCBs across generations.

The rest of the paper is structured as follows. In the second section we discuss VC involvement and its effect on growth and performance in FCBs across generations and develop our research hypotheses. In the third section we describe the data and the methodology. In the fourth section we present the results of the empirical analyses. In the fifth section we provide additional evidence on our results. Finally, in the last section, we discuss the implication of the results and conclude.

2. Socioemotional wealth and venture capital in family businesses

New and adapted theories have been published recently to increase our understanding of family attitudes, among which a new framework describing the SEW, or affective endowment, of

family owners should be highlighted. Owners of FCBs are concerned not only with financial returns but also with the desire to protect their SEW in those firms. Recent studies (Chu, 2011; Gómez-Mejía et al., 2007; Gómez-Mejía et al., 2011; Wright & Kellermanns, 2011) define five broad categories to describe non-economic factors influencing managerial decisions under the SEW umbrella: organizational choices concerning management processes, firm strategies, corporate governance, stakeholder relations and business venturing. Gómez-Mejía et al. (2011) argue that SEW explains many of these choices. Contingency factors, such as family stage, firm size, firm hazard, and the presence of non-family shareholders, moderate the influence of SEW preservation on managerial decisions in FCBs (Gómez-Mejía et al., 2011).

The SEW concept is projected on a generational perspective (Gómez-Mejía et al., 2007) emphasizing that attitudes of family members differ across generations, thus affecting their capacity to influence the company's strategic direction (Sonfield & Lussier, 2004). Furthermore, according to the SEW perspective, the degree of family identification, influence and personal investment in the firm changes as the company evolves across generations (Gersick et al., 1997; Schulze et al., 2003).

Dyer (1988) and McConaughy and Phillips (1999) note the differences between first and following generations in FCBs. Sonfield and Lussier (2004) define a first generation FCB as a family-owned and managed firm with more than one family member but only the founder generation involved. Second or third generation FCBs are those in which the second or third family generation is involved, whereas the first generation is retired or deceased. Gómez-Mejía et al. (2007) define three family stages assuming that in the first the company is owned and managed by the founder generation, whereas in the second the FCB is owned and managed by extended family members and in the third the company is owned by extended family members and managed by non-family professionals.

Regarding performance of FCBs across generations, many works highlight the positive influence of the founder's entrepreneurial spirit on the existence, growth and performance of the company (Adams et al., 2005; Eddleston & Kellermanns, 2007; Sraer & Thesmar, 2007; Villalonga & Amit, 2006, among others). Conversely, some works find evidence of a negative influence of founder's presence (Chirico et al.., 2012; Jayaraman et al., 2000; Johnson et al., 1985; McConaughy et al, 1998; Slovin & Sushka, 1993, among others), whereas others find no significant differences in performance (Poutziouris & Sitorus S, 2001; Westhead, 2003).

These results indicate that there could be a peak in founder's positive influence (Perez-Gonzales, 2006), which is consistent with the perspective of the SEW of ownership for the family (Gómez-Mejía et al., 2007; Gómez-Mejía et al., 2011; Wright & Kellermanns, 2011).

VC involvement may reduce the negative effects of the desire to protect SEW on family performance. VC investors address some of the issues that are linked to SEW preservation, such as succession, professionalization of the company, growth and diversification. VCs are specialized investors with outstanding screening abilities (Zacharakis and Meyer, 2000) who allocate money to companies with promising growth opportunities. In addition to funding, they also contribute to 'build winners' by providing effective monitoring (Kaplan & Strömberg, 2003; Lerner, 1995; Sahlman, 1990) as well as other value-adding services. The close supervision of investee firms after the initial VC investment contributes to reducing agency costs and enhances firm performance (Admati & Pfleiderer, 1994; Lerner, 1995). But agency theory neglects to consider the effect of a key coaching function (Colombo & Grilli, 2010; Hellman & Puri, 2002; Reid, 1996) since VC managers also increase the bundle of resources of the portfolio company. In addition to funding, VC managers provide assistance in management recruitment, access to their network of contacts and expertise on operational planning (Gorman and Sahlman, 1989; Hellman & Puri, 2002; Sahlman, 1990; Sapienza et al., 1996), which become valuable resources

for the investee firm (Shepherd et al., 2000). All these additional resources enhance and complement the entrepreneurial orientation of the portfolio company and, thus, affect its subsequent performance.

Regarding performance, analyzing revenue or earnings growth would ignore that the investee FCB received long term funding that could explain the better performance after the initial VC investment. By focusing on total factor productivity (TFP) we are able to control for the additional funding received since the increase in output would be balanced with the additional inputs that the company received (Croce et al., 2010). At the same time, TFP measures the efficiency in the use of inputs, which determines long term performance. Therefore, we are able to analyze screening and value added without the distortion of funding.

Even though the representation of FCBs in the portfolios of VC investors in small (Martí et al., 2010), many FCBs receive VC funding, and a significant percentage of them are invested when the first generation is still running the business. In accordance with Gómez-Mejía et al. (2007), the desire to protect SEW would discourage FCBs from approaching VC investors, especially in first generation FCBs. This apparent contradiction could be explained by the possible underperformance of the target company. From the perspective of capital structure theory, FCBs strongly adhere to the logic of the pecking order theory (Cassar & Holmes, 2003; López-Gracia & Sánchez-Andújar, 2007), which affirms that there is a hierarchical order of potential financing sources and internally generated resources are preferred over external ones (Myers & Majluf, 1984). External equity would be used only as a last resort (Dunn & Hughes, 1995; Poutziouris, 2001; López-Gracia & Sánchez-Andújar, 2007). In this line, low performing companies would not generate enough resources internally to cover their financing needs and would access external sources of financing. Since information asymmetry problems limit the banks' ability to

analyze the risk of investment projects in unquoted companies, specialized equity investors such as VCs would become a last resort (Bertoni et al., 2012).

In addition, there is evidence indicating that families try to secure the long-term survival of the company, even at the risk of jeopardizing SEW. Gómez-Mejía et al. (2007) affirm that family-owned mills are more willing to join corporations (i.e. to sell shares and control to non-family shareholders) when the company is experiencing business trouble. In the same vein, Gómez-Mejía et al. (2010) find that family shareholders of large, publicly traded FCBs are more likely to diversify their holdings when the firm is declining. Wright et al. (2011) find that founder FCBs with decreasing results tend to approach VC investors.

From a different perspective, initially founders in FCBs must invest time and capital in the startup and early expansion processes of the company. Consequently, they are not able to diversify family wealth and, therefore, are subject to a high firm-specific risk. Companies exhibiting low TFP growth could anticipate low future performance and cash flow generation, which would limit the possibility of investing in other potentially profitable opportunities later. Gómez-Mejía et al. (2007) affirm that owners in some FCBs may fear the company's inability to fund a retirement arrangement, particularly when there is not a suitable internal family successor. This may force founders to accept external investors to finance the company's pension plan (Tappeiner et al., 2012).

Consequently, our first hypothesis is:

Hypothesis 1. Due to the desire to protect SEW, only low performing first generation FCBs accept VC investors as external shareholders.

Family issues are hard to handle for outsiders (Haynes & Usdin, 1997; Kaye, 1991). Since in first generation FCBs only the founding generation is present, ownership structures tend to be

less dispersed than in descendent generation FCBs (Gómez-Mejía et al, 2007). Therefore, it is easier for VC investors to change governance structures to improve performance (Robbie et al., 1999; Wright et al., 1994, Wright et al., 2001). In fact, high ownership dispersion increases the likelihood of incurring in costs to serve family members, such as creating jobs or maintaining their standard of living (Sharma et al., 1997), thus leading to negative business performance (Eddleston & Kellermanns, 2007; Harvey & Evans, 1994; Olson et al., 2003).

FCBs are seen as less efficient and professional, especially at the founding stage (Howorth et al., 2007; Martinez et al., 2007). But the entrepreneurial orientation of the FCB is highest in the first generation (Gómez-Mejía et al, 2007). Therefore, a significant improvement in productivity growth is expected, since VC managers will enhance the company's entrepreneurial orientation (Cruz & Nordqvist, 2012) by contributing with valuable coaching capabilities described in this section. Accordingly, we agree with Scholes et al. (2010) that the scope for efficiency gains and growth is high in first generation FCBs.

Then, our second hypothesis can be formulated as follows:

Hypothesis 2. The entry of a VC investor in first generation FCBs leads to a significant improvement in performance.

Bammens et al. (2008), Salvato and Melin (2008), and Sonfield and Lussier (2004), among others, provide evidence on differences in value creation expected across generations. According to the SEW perspective the entrepreneurial orientation of the FCB in second or following generations should be lower than in the first generation (Gómez-Mejía et al, 2007). Managers in second or following generation FCBs could be more inclined to object to new venture initiatives and to accept higher levels of business risk to get advantage of growth opportunities. In fact, even though first generation FCBs are more inclined to retain control (Gómez-Mejía et al.,

2007), if an external investor is accepted in the board the family managers would still have the entrepreneurial orientation that allowed the initial growth of the company. Therefore, it is easier for both parties to align their interests to start a new growth process with the assistance and funding of the VC investor. Conversely, the decreasing entrepreneurial orientation of managers in FCBs in subsequent generations could delay the implementation of new investment initiatives.

Furthermore, a less disperse ownership structure in founder FCBs should lead to lower agency costs because the risk of facing family conflicts (e.g. succession problems or drain of resources) tends to be lower (Miller & Le Breton-Miller, 2006). Regarding employees, the number of family members involved in the business is likely to increase over time, and the selection method is not always based on their capabilities (Dyer, 2003). In addition, the relationship between owners and employees tends to be stronger in first generation FCBs (Horton,1986), and there is a higher understanding of the firms' local environment (Randøy and Goel, 2003). Therefore, it is easier to implement changes in monitoring and performance incentives, and to start new entrepreneurial ventures, in first generation FCBs (Robbie et al., 1999; Wright et al., 1994, 2001). Therefore, the potential for gains in efficiency is also higher in those companies (Scholes et al., 2010).

Our third hypothesis follows from this discussion:

Hypothesis 3. The effect of VC involvement on performance should be higher in first generation FCBs than in second or following generation FCBs, both in the short and the long term.

3. Data and methodology

3.1. Description of the sample

We focus our work on the Spanish market because there is a large number of FCBs, a few of them quoted, and there is also enough information on VC investments available over a long

period of time. On the one hand, there is a source of data that compiles all individual VC investments since 1991. On the other, every Spanish company is required to report its accounts to the Official Trade Register since the same year. Since we have to control for selection effects and we also need to have enough post-investment observations, we focus our research on VC investments performed between 1995 and 2005, with accounting data available until 2010. According to Martí et al. (2011), 1,815 VC investments were recorded in Spain in that period, including all stages but excluding financial and real estate sectors, as well as investments carried out abroad by Spanish VC institutions. We were able to fully identify 1,508 of them in the Official Trade Registers, but full accounting data was only available on 1,335 companies.

By stage of development of the investee company, there were 599 early stage firms, 573 companies at the expansion stage and 163 mature firms. We classify a firm as an early stage investment if it receives funding to complete the final development of the product or service to be distributed (seed), or already has a product or service and is raising money to launch the manufacturing and distribution of the product (start-up). Expansion stage investments are defined as equity or quasi-equity investments in existing firms with at least one profitable line of business. Mature firms are defined as established firms in which the investor acquires either a minority or a majority stake and most of the money is used to buy existing shares.

The sources of VC information are the Spanish Venture Capital Association (ASCRI) and www.webcapitalriesgo.com. The sources of accounting information are the AMADEUS Database and the Official Trade Registers.

Since we base our analyses on TFP estimations, estimated with GMM (Blundell & Bond, 2000), we need at least five consecutive observations to define instruments properly, with the year of the initial investment being one of them. As a result, our sample size shrinks to 673 companies.

The final step in the sampling process is to investigate the family or non-family nature of those firms. Based on information gathered from the AMADEUS database, the firms' websites, the official corporate news releases (BORME) and press clippings, we define FCBs as those whose ultimate largest shareholder is a family, or individuals closely linked to a family group. This definition is in accordance with the official family business definition given by GEEF (European Group of Owner Managed and Family Enterprises) and FBN (Family Business Network) in 2008 and also adopted by the IEF (Family Business Institute in Spain). On these grounds we identify 197 FCBs and 476 non-family businesses, with FCBs representing 29.3 per cent of all sample firms.

Table 1 reports the distribution of family and non-family sample firms by year of initial investment, by stage of development of the portfolio company at the time of the initial VC investment and by activity sector. FCBs are mostly manufacturing companies at the expansion stage.

[Table 1]

In Table 2 we represent sales and employees of VC-backed FCBs according to the generation in which the VC investor was involved.

[Table 2]

3.2. Models and methodology

Our empirical models are based on model 4 from Croce et al. (2010). Our aim is to detect the effect of VC financing, in terms of both screening and value-added, on the productivity of invested firms by distinguishing between family (first generation vs. second or following generations) and non-family firms. In order to do that we modify the model as follows:

$$\text{TFP\_growth}_{it} = \alpha_0 + \beta x_{i,t} + \gamma_{pre_{f1}} VC_{i,t}^{pre} * d_{family_{g1}} + \gamma_{pre_{ff}} VC_{i,t}^{pre} * d_{family_{gf}} +$$

$$\gamma_{short} VC_{i,t}^{short} + \gamma_{short_{f1}} VC_{i,t}^{short} * d_{family_{g1}} + \gamma_{short_{ff}} VC_{i,t}^{short} * d_{family_{gf}} +$$

$$\gamma_{long} VC_{i,t}^{long} + \gamma_{long_{f1}} VC_{i,t}^{long} * d_{family_{g1}} + \gamma_{long_{ff}} VC_{i,t}^{long} * d_{family_{gf}} + \mu_i + \varepsilon_{it} \quad [1]$$

where the dependent variable $\text{TFP\_growth}_{i,t}$ is one-year TFP growth of firm i in year t. We base our TFP estimations on the GMM-system (GMM-SYS) estimator developed by Blundell and Bond (2000). According to Van Biesebroeck (2007), we estimate TFP separately for each industry. Then, in the final step, the residuals of the production function are used to estimate firm's TFP growth.

Regarding the independent variables, in order to distinguish between FCBs in first and second or following generations we include two dummies: $d_{family_{g1}}$ is a dummy variable that equals 1 for FCB *i* in first generation and 0 otherwise, whereas $d_{family_{gf}}$ equals 1 for FCBs in second or following generations, and 0 otherwise. $VC_{i,t}^{pre}$ is a dummy variable that equals 1 before receiving VC funding, or 0 otherwise; $VC_{i,t}^{short}$ is a dummy that equals 1 in the first three years following the year of the initial VC investment and 0 otherwise; $VC_{i,t}^{long}$ equals 1 for later years (i.e. from t+4 onwards) in investee companies, and 0 otherwise. $x_{i,t}$ is a set of control variables that includes the stage of development and the age of the investee firm. In fact we assume that companies that are starting up will show higher TFP growth levels than more mature firms. Similarly, younger firms will experience higher TFP growth than older companies. Moreover, we include three dummy variables representing whether the VC investor investing in company i has high, medium or low amount of funds under management, which represents a signal of the reputation in Spanish VC institutions (Balboa & Martí, 2007). We also include industry dummies and year dummies that allow us to control for cross-sectional differences among industries and across time, respectively. Finally, μ_i are firm-fixed effects inserted to control for unobserved

heterogeneity at firm-level that may lead to a biased estimate of VC coefficients. ε_{it} is an i.i.d. error term.

To test our H1 we look at the coefficient $\gamma_{pre_{f1}}$. A negative and significant value of this coefficient would confirm our first hypothesis on the screening effect of VC: first generation FCBs would present a lower TFP growth than non-family firms in the years before the VC investment. Conversely, for second or following generations FCB we expect that the coefficient $\gamma_{pre_{ff}}$ would be not significant as the need to protect SEW assumes a lower relevance in defining firm's strategies. As a consequence, no differences are expected in TFP growth levels, before the entry of VC, between the groups of non-family firms and second or following generations FCBs.

In order to evaluate the short term effect by VC, net of the screening effect, we need to perform the following Wald tests[1]:

VC has a short term effect on productivity in non-family firms:

$$\gamma_{short} > 0 \qquad [t1.1]$$

VC has a short term effect on productivity in FCBs in first generations:

$$\gamma_{short} + \gamma_{short_{f1}} - \gamma_{pre_{f1}} > 0 \qquad [t1.2]$$

VC has a short term effect on productivity in FCBs in second or following generations:

$$\gamma_{short} + \gamma_{short_{ff}} - \gamma_{pre_{ff}} > 0 \qquad [t1.3]$$

Similar test would be applied to evaluate the long term effect:

[1] In GMM estimations the coefficient of $VC_{i,t}^{pre}$ is always excluded in estimates and, thus, in linear combination tests.

VC has a long term effect on productivity in non-family firms:

$$\gamma_{\text{long}} > 0 \qquad \text{[t1.4]}$$

VC has a long term effect on productivity in FCBs in first generations:

$$\gamma_{\text{long}} + \gamma_{\text{long}_{\text{f1}}} - \gamma_{\text{pre}_{\text{f1}}} > 0 \qquad \text{[t1.5]}$$

VC has a long term effect on productivity in FCBs in second or following generations:

$$\gamma_{\text{long}} + \gamma_{\text{long}_{\text{ff}}} - \gamma_{\text{pre}_{\text{ff}}} > 0 \qquad \text{[t1.6]}$$

To test if H2 is confirmed in our sample we expect that test reported in equations [t1.2] and [t1.5] show significant coefficients.

Moreover, in order to test H3, comparing the VC effect between first generation FCBs and second or following generations FCBs, we need to perform the following tests on short and long term, respectively:

$$\gamma_{\text{short}_{\text{f1}}} - \gamma_{\text{pre}_{\text{f1}}} - \gamma_{\text{short}_{\text{ff}}} - \gamma_{\text{pre}_{\text{ff}}} > 0 \qquad \text{[t1.7]}$$

$$\gamma_{\text{long}_{\text{f1}}} - \gamma_{\text{pre}_{\text{f1}}} - \gamma_{\text{long}_{\text{ff}}} - \gamma_{\text{pre}_{\text{ff}}} > 0 \qquad \text{[t1.8]}$$

testing whether the effect of VC in first generation FCBs is higher than that VCs obtain in second or following generations FCBs.

As robustness check, in order to exclude any screening effect between family and non-family firms, we only focus on FCBs (i.e. excluding non-family firms). We thus estimate the effect of VC financing on FCB's productivity through the following model:

$$TFP_{growth_{it}} =$$

$$\alpha_0 + \beta x_{i,t} + \delta_{pre_{f1}} VC_{i,t}^{pre} * d_{family_{g1}} + \delta_{short_{family}} VC_{i,t}^{short} + \delta_{short_{f1}} VC_{i,t}^{short} * d_{family_{g1}} +$$

$$\delta_{long_{family}} VC_{i,t}^{long} + \delta_{long_{f1}} VC_{i,t}^{long} * d_{family_{g1}} + \mu_i + \varepsilon_{it} \quad [2]$$

According to H1 we expect $\delta_{pre_{f1}}$ be negative and significant, indicating a lower productivity in the pre-investment period for first generation FCBs.

As for equation [1], to study the short term effect, net of the screening effect, we need to perform the following Wald tests:

VC has a short term effect on productivity in FCBs in first generations:

$$\delta_{short_{family}} + \delta_{short_{f1}} - \delta_{pre_{f1}} > 0 \quad [t2.1]$$

VC has a short term effect on productivity in FCBs in second or following generations:

$$\delta_{short_{family}} > 0 \quad [t2.2]$$

In order to test the long term effect of VC financing we finally perform the following tests:

VC has a long term effect on productivity in FCBs in first generations:

$$\delta_{long_{family}} + \delta_{long_{f1}} - \delta_{pre_{f1}} > 0 \quad [t2.3]$$

VC has a long term effect on productivity in FCBs in second or following generations:

$$\delta_{long_{family}} > 0 \quad [t2.4]$$

Again, to test H2 we look at the results of tests [t2.1] and [t2.3], whereas to test H3 we need to perform the following tests in order to compare short and long term effects of VC in first generation FCBs vs. second or following generation ones:

$$\delta_{\text{short}_{f1}} - \delta_{\text{pre}_{f1}} > 0 \qquad \text{[t2.5]}$$

$$\delta_{\text{long}_{f1}} - \delta_{\text{pre}_{f1}} > 0 \qquad \text{[t2.6]}$$

Finally, as further robustness check, we completely exclude any screening effect and, in order to assess the value added provided by VC investors, we estimate separately this simple model for first generation and second or following generation FCBs:

$$\text{TFP}_{\text{growth}_{it}} = \alpha_0 + \beta x_{i,t} + \theta_{\text{short}} \text{VC}_{i,t}^{\text{short}} + \theta_{\text{long}} \text{VC}_{i,t}^{\text{long}} + \mu_i + \varepsilon_{it} \qquad \text{[3]}$$

We estimate equations [1], [2] and [3] with different procedures. We start with Ordinary Least Squares (OLS) estimation in which we treat firm-specific effects as equal among all firms. We continue with random effects (RE) estimated with robust standard errors. In OLS and RE estimations we control for selection by inserting additional terms (i.e. $\text{VC}_{i,t}^{\text{pre}}$) to isolate TFP growth differences between family (first and second or following generations) and non-family VC-backed firms before the initial VC round.

In addition, to further address endogeneity problems that could distort the analysis of the value-adding effect of VC involvement (Bond et al., 2001), we also resort to the two-step difference generalized method of moments (GMM-DIFF) estimator (Arellano & Bover, 1995; Blundell & Bond, 1998) with finite-sample correction (Windmeijer, 2005). In the specification estimated with the GMM-DIFF estimator we exclude the additional term included in OLS and RE estimations and consider the VC variables as endogenous (i.e. instruments start from t-2).[2]

[2] However, to avoid that the use of a large number of instruments results in significant finite sample bias, and that measurement errors cause potential distortions in our estimates, the instrument set is restricted with moment conditions in the interval between t-2 and t-4 (see Bond, 2002).

3.3. Descriptive statistics

This study deals with a total sample of 673 investee firms, 197 of which are FCBs (112 in first generation and 85 in second or following generations). In Panel A of Table 3, we report some descriptive statistics about size (in terms of total assets, fixed assets and sales), employment (in terms of payroll expenses and headcount) and age for family and non-family businesses.

[Table 3]

We show summary statistics, such as mean, median and number of observations for each category in both pre and post-investment periods. Moreover, for every variable, we perform t-tests on the difference-in-mean between the group of FCBs and the group of non-family businesses. We find that there are significant differences between the two groups before the initial VC round. In particular, FCBs are smaller in terms of both output and input variables of production function (sales, capital and labor costs). Conversely, after the first round of VC financing, on average, FCBs are able to increase their revenues and capital (in terms of total assets, fixed assets and sales) whereas labor costs are still lower than those paid by non-family firms. This evidence seems to suggest a positive effect of VC on the growth of the investee companies.

In panel B of Table 3 we compare FCBs in first generation vs. FCBs in second or following generations. First generation FCBs seem to be significantly smaller and younger than second or following generation ones in both pre and post- investment periods.

In Table 4 we specifically focus on TFP growth. Panel A shows descriptive statistics (such as mean, median and number of observations) on TFP growth of FCBs compared with the non-family ones, both in the years before and after the first round of VC financing. Panel B compares TFP growth in FCBs according to the generation in which the VC investor was involved.

[Table 4]

Before the involvement of VC investors, FCBs seem to show a lower TFP growth than non-family ones. In addition, among FCBs, first generation firms show a lower productivity growth than FCBs in following generations. However, in both cases, differences become not significant after the entry of the VC investors.

These unconditional summary statistics seem to suggest that VC investors seem to invest in FCBs, especially in the first generation, with lower productivity performance and, especially for this group of firms, they contribute to increase firm's productivity growth.

4. Results

The regression results of equation [1] on the full sample of VC-backed firms, including both family and non-family businesses, are shown in Panel A of Table 5. The three columns report ordinary OLS, RE and GMM-DIFF estimations. Regarding screening, our results show that, in accordance to what is shown in the descriptive statistics (Section 3.3), FCBs that received VC funding during the first generation showed TFP growth levels significantly lower than those found in non-family investees prior to the VC investment event. Nevertheless, this was not the case of FCBs in second or following generations, which did not exhibit significant differences with non-family firms in TFP growth prior to the initial VC investment. This finding confirms our first hypothesis.[3]

The variable $\mathbf{VC_{i,t}^{short}}$ reports that TFP growth is positive and significant, on average, in VC-backed companies in the first three years after the initial investment, but only when the models are estimated using OLS or RE techniques. Nevertheless, our main interest is to check how VC

[3] We address the screening hypothesis in Section 5 by providing further evidence to our results.

investors are able to add value in FCBs over time and across generations. The effective predictions are based on the Wald tests defined in Section 3.2 (i.e. Equations [t1.1]-[t1.6], which are shown in Panel B of Table 5. Therefore, in the first three years after the initial VC round we find that there is a significant TFP growth in FCBs which receive VC funding in the first generation. This result confirms our second hypothesis, since VC investors are able to increase TFP growth in first generation FCBs in a significant way in the short term. Moreover, this result is consistent with the positive effect found in the GMM column, which does not require controlling for the endogeneity of the VC investment. Conversely, there is not a significant effect on TFP growth of VC involvement in the first three years after the investment in FCBs in second or following generations. GMM estimation of the model even shows a negative coefficient for the variable $\mathbf{VC_{i,t}^{short}}$.

Regarding the long term effect (i.e. from the fourth year after the initial investment onwards), results show a non significant impact of VC on non-family firms. As to FCBs, as shown in the last rows of Table 4, we find that a significant TPF increase engendered by VCs is found when FCB is in the first generation. This result also holds when the estimation is carried out using GMM methodology. Conversely, a non significant effect in the long term TFP growth levels is found in FCBs that were subject to a VC investment when they were in second or following generations. Furthermore, a marginally significant negative coefficient is found when the model is estimated with the GMM methodology.

In addition, in the last two rows of Panel B of Table 5 we test our third research hypothesis on whether there are significant differences in TFP growth rates between FCBs in first and second or following generations, both in the short and long term (according to the test [t1.7-t1.8] explained in Section 3.2). It should be remarked that regardless of the estimation technique employed, short term and long term TFP growth rates are significantly different between both

groups, confirming our H3, with the results showing the highest significance level in the case of coefficients estimated using the GMM-DIFF methodology.

In order to enhance the robustness of our results, in Panel A of Table 6 we estimate equation [2] only on the subsample of VC-backed FCBs, again comparing TFP growth in firms in first versus second or following generations. When we analyze the pre-investment efficiency level, again we find that VC investors invested in first generation FCB that showed lower TFP growth levels than those found in second or following generations. This is in line with the results of Table 5, when first generation FCBs are compared with non-family and second or following generation FCBs prior to the initial investment.

Regarding the short term effects, the coefficients of $\mathbf{VC_{i,t}^{short}}$ variable in FCBs in second or following generations estimated with OLS, RE and GMM-DIFF methodologies are not significant. Again, the significance of TFP growth for first generation FCBs is reported in Panel B of Table 6 according to tests in Equations [t2.1-t2.4]. In the short term we find that FCBs that received VC funding during the first generation showed a positive and significant improvement in TFP growth, compared with the pre-investment period. Similarly, the TFP growth is also significantly higher in first generation FCBs in the long term (i.e. from the fourth year after the initial VC round onwards). The only exception is long term effect in FCB in second or following generations that is also positive and significant in GMM-DIFF estimation. However, it is important to observe that the same coefficient in first generation FCB is significantly higher.

Again, in the last two rows of Panel B of Table 6 we test our third research hypothesis on whether there are significant TFP growth rates between FCBs in first and second or following generations, both in the short and long term (according to the test [t2.5-t2.6] explained in Section 3.2). Again, regardless of the estimation method employed, short term and long term TFP growth rates are significantly higher in first generation FCBs, confirming our H3, with the results

showing the highest significance level again in the case of coefficients estimated using the GMM-DIFF methodology.

As a final check, we estimate Equation [3] separately for the two subsamples of FCBs backed by VC institutions, namely those that received VC funding in the first generation and those being funded in second or following generations. In this model there is no need to control for selection (i.e. analysis of TFP growth before the initial VC investment) because regressions are carried out separately for both groups. Accordingly, there is no need to perform Wald tests to test the value-added effect (i.e. by checking for the existence of significant differences with the pre-investment period). The results are reported in Table 7. For FCBs in the first generation, we find a positive and significant growth in TFP, both in the short and in the long term, regardless of the estimation method employed. Conversely, we do not find significant TFP growth in firms in second or following generation, neither in the short or the long term, in FCB in second or following generations in columns OLS and RE. We do find significant values in the GMM column that would show positive long term performance in FCBs in second or following generations. Nevertheless, this difference is not significant when it is compared with long term growth of first generation FCBs. In addition, we have to report that GMM estimations could not be reliable in this group due to the lack of significance of AR1. Consequently, again, our third hypothesis is confirmed.

To sum up, VC investors seem to select first generation FCBs exhibiting lower TFP growth than other family and non-family VC-backed companies and are able to increase TFP growth significantly both in the short and the long term. This is in accordance with our hypotheses because the entrepreneurial orientation of the family managers is higher in these firms than in second and further generations FCBs. As a result, VC investors are able to implement their

value-adding activities with fewer conflicts than those found in FCBs in second or following generations.

5. Further evidence on screening

In the previous section we showed that, before receiving VC funding, FCBs in first generation exhibit significantly lower TFP growth than other investee firms, both non-family and FCBs in second or following generations. We interpreted this result as a confirmation of H1 since first generation FCBs would only approach VC investors if their troubles in sustaining firm's growth overweight the desire to protect their SEW.

In order to better exploit the screening hypothesis, in this section we perform a further analysis by introducing a matched sample of non-VC-backed FCBs. We aim to verify, by resorting to a selection equation, that the receipt of VC financing is negatively correlated to productivity growth in first generation FCBs, whereas this relationship is not significant in second or following generation FCBs. [4]

We built a matched sample of non-VC-backed FCBs that is comparable to the sample of VC-backed FCBs according to a set of *a priori* defined characteristics (for a similar procedure in the VC literature, see e.g. Chemmanur et al., 2011; Croce et al. 2012). Control group companies are identified using a propensity score method. The aim is to find, for each FCB that received VC financing in year t, the non VC-backed FCB that, in the same year, had the most similar probability (i.e. propensity score) of receiving VC. Propensity scores are obtained by estimating, for each year, a probit model in which the dependent variable is the occurrence of a VC

[4] We are aware that, as theorized by Eckhardt et al. (2006), the venture financing process is a multistage screening process, in which, first, an entrepreneur must decide to seek financing from outside sources and then an investor must fund it. To some extent, in our analyses, we "mix" these two stages of screening by assuming the selection by VC as a proxy of the willingness of entrepreneurs to seek external financing. To avoid this shortcoming, we would need data on family firms that asked for VC without obtain it. Unfortunately, we do not have this type of information in our dataset.

investment and independent variables include: age, size (measured by the end-of-period book value of firm's total assets), sales, intangible assets to total assets, region and industry controls. [5] We run the matching procedure separately for first generation FCBs and second or following generation ones. After matching the sample is composed by 174 VC-backed FCBs (110 of which in first generation) and 140 non-VC-backed FCBs (73 of which in first generation).

In Table 8, we report some descriptive statistics about size (in terms of total assets and sales), employment (in terms of payroll expenses and headcount), age and TFP growth for VC-backed and matched non-VC-backed FCBs.

[Table 8]

We show summary statistics, such as mean, median and number of observations for each category in both pre and post-investment periods. Moreover, for every variable, we perform t-tests on the difference-in-mean between the group of VC-backed FCBs and the matched control group. We do not find significant differences between VC-backed FCBs and the matched control group before the initial VC round. Conversely, after the first VC round, VC-backed firms are, on average, larger than non-VC-backed firms in terms of total assets, sales, payroll expenses and headcount. As for TFP growth, no significant differences are found in both the pre and post-investment periods. These unconditional summary statistics seem to suggest that VCs, on average, do not perform any screening activity on FCBs and do not significantly contribute to foster FCBs' productivity growth.

First, one may argue that, even among non-VC-backed firms, the TFP growth in first generation FCBs is lower than that in following generation FCBs, thus meaning that the result cannot be related to VC selection. However, we verify that among non-VC-backed firms, first generation FCBs do not show significant differences in their TFP growth, on average, than other FCBs (p-

[5] We performed a nearest neighbor matching. The sampling of the control group is performed with replacement so that each control group firm can be selected as a match for more than one VC-backed firm (possibly in different years).

value of t-test equals to 0.817). This evidence allows us to conclude that only first generation FCBs with lower TFP growth look for VC funding.

Second, we proceed to a multivariate analysis on screening by VC by using a dynamic probit model in which the dependent variable is a binary dummy, identifying whether a firm receives VC backing or not. This dependent variable is always equal to zero for all non-VC-backed FCBs. For VC-backed FCBs, it is zero in all years prior to receiving VC financing, and it equals one in the year in which the firm receives VC financing. It is set to missing in the following years. Thus, VC-backed firms effectively drop out of the sample for all years subsequent to the year of receiving financing.[6] As independent variables we include TFP growth, age, size (measured by the logarithm of total assets) and the stage of development of the company. Moreover, we also include the ratio between intangible assets and total assets as measure of growth orientation (e.g. Caves, 1980; Itami, 1987; Myers, 1977). In order to test our H1, we estimate two different dynamic probit models by distinguishing among first generation and second or following generation FCBs. Results are shown in Table 9.

[Table 9]

Results confirm that VC investors are able to invest, among first generation FCBs, only in those with lower productivity growth, whereas this result does not hold for following generation FCBs. We interpret this evidence as a further proof of H1. As for control variables, we find that VC-backed FCBs are larger than non-VC-backed ones, in both first and following generations FCBs. Conversely, only for first generation VC-backed FCBs, VC investors invest in younger firms and those with higher growth orientation. These selection criteria do not hold for following generation FCBs.

[6] This procedure is customary in empirical analysis on selection (see Chemmanur et al., 2011 for a similar procedure)

6. Conclusions

FCBs are the prevailing form of enterprise in the world. Nevertheless, since family shareholders are more reluctant to allow the presence of external shareholders, FCBs are underrepresented in the portfolios of VC institutions. As a result, the study of VC involvement in FCBs has been neglected in the literature. With this paper we intend to contribute to fill this gap. First, based on the perspective of owners' SEW, we aim to analyze why VC investors are accepted as shareholders in first generation FCBs. We argue that family owners overcome their natural reluctance to accept an external shareholder, to protect their SEW, because the future of the company could be in danger. Second, we aim to analyze the impact of VC involvement in FCBs in first and second or following generations. We anticipate that the value-adding effects of VC involvement should be more effective in first generation FCBs, since the management culture is not as established, ownership dispersion is lower and the entrepreneurial orientation is higher than in FCBs in second or following generations.

We focus our analyses on a large sample of family and non-family VC-backed firms that received VC funding between 1995 and 2005. Our results show that VC institutions choose first generation FCBs showing significantly lower TFP growth levels than those found in non-family firms or in FCBs in second or following generations. After the entry of the VC investor, as expected, TFP growth is positive and significant in first generation FCBs, both in the long term and in the short term. The use of TFP allows us to control for the other possible explanation for a better performance (i.e. the funding received) of the investee firm, because we already proved that first generation FCBs were not better than the rest of the investee firms. Therefore, we can explain the higher performance by the value-adding effect of VC involvement, which is effective in improving the entrepreneurial orientation of the FCB managers. In addition, we find evidence on the higher effect on performance in first versus second or subsequent generations, which

could be based on the lower agency conflicts and higher entrepreneurial orientation of the former. We argue that these reasons determine a higher room for performance improvements in the first generation.

Our work contributes to the existing literature on FCBs in several ways. First, it increases our understanding of VC involvement in FCBs, which has been neglected in the literature. Second, we provide new evidence aligned with the ideas of the SEW preservation perspective. More precisely, we provide further evidence on the highest desire to protect SEW in first generation FCBs, which is reflected by the fact that only those showing significantly lower TFP growth levels accept VC funding. This paper also provides evidence on the positive effect of VC involvement in FCBs, especially when the firm is still in the first generation. Finally, the higher TFP growth levels found in first generation FCBs also provides additional evidence on the higher entrepreneurial orientation of those firms, when compared to that of FCBs in extended generations.

For further research, it should be analyzed why the selected first generation FCB investees were not performing as the rest and whether that situation triggered the need to contact VC investors.

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References

Adams, R.B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and Their Impact on Corporate Performance, Review of Financial Studies, 18(4), 1403–1432.

Admati, A., & Pfleiderer, P. (1994). Robust Financial Contracting and the Role of Venture Capitalists, The Journal of Finance, 49(2), 371–402.

Alemany, L., & Martí, J. (2005). Unbiased Estimation of Economic Impact of Venture Capital Backed Firms: EFA 2005 Moscow Meetings Paper, SSRN eLibrary.

Arellano, M., & Bover, O. (1995). Another look at the instrumental-variable estimation of error components models. Journal of Econometrics, 68, 29–52.

Balboa, M., & Martí, J. (2007). Factors that determine the reputation of private equity managers in developing countries. Journal of Business Venturing, 22, 453-480

Bammens, Y., Voordeckers, W., & van Gils, A. (2008). Boards of directors in family firms: a generational perspective. Small Business Economics, 31(2), 163–180.

Berrone, P., Cruz, C., Gomez-Mejía , L.R., & Larraza-Kintana, M. (2010). Socioemotional wealth and organizational response to institutional pressures: Do family controlled firms pollute less? Administrative Science Quarterly, 55, 82–113.

Bertoni, F., Ferrer, M.A., & Martí, J. (2012). The different role played by venture capital and private equity investors on the investment activity of their portfolio firms. Small Business Economics (forthcoming).

Blundell, R., & Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. Journal of Econometrics, 87, 115–143.

Blundell, R., & Bond, S. (2000). GMM Estimation with persistent panel data: an application to production functions. Econometric Reviews, 19(3), 321–340.

Bond, S., Hoeffler, A., & Temple, J. (2001). GMM estimation of empirical growth models. Working Paper University of Oxford, No. 2001-W21.

Cassar, G., & S. Holmes (2003). Capital structure and financing of SMEs: Australian evidence. Accounting and Finance 43(2), 123-147.

Caves, R.E. (1980). Industrial organization, corporate strategy and structure: A survey. Journal of Economic Literature, 18(1), 64-92.

Chan, Y.S. (1983). On the Positive Role of Financial Intermediation in Allocation of Venture Capital in a Market with Imperfect Information. Journal of Finance, 38(5), 1543–1568.

Chemmanur, T.J., Krishnan, K., & Nandy, D.K. (2011). How Does Venture Capital Financing Improve Efficiency in Private Firms? A Look Beneath the Surface. Review of Financial Studies, 24(12), 4037–4090.

Chirico, F., Sirmon, D., Sciascia S., & Mazzola P. (2012). Entrepreneurial orientation, generational involvement and participative strategy: A configurational approach to entrepreneurship in family firms. Strategic Entrepreneurship Journal (in press).

Chu, W. (2011). Family ownership and firm performance: Influence of family management, family control, and firm size. Asia Pacific Journal of Management, 28(4), 833–851.

Colombo, M., & Grilli L. (2010). On growth drivers of high-tech start-ups: Exploring the role of founders' human capital and venture capital. Journal of Business Venturing, 25, 610–626.

Colombo, M., Grilli, L., & Piva, E. (2006). In search for complementary assets: the determinants of alliance formation of high-tech start-ups. Research Policy, 35, 1166–1199.

Croce, A., Martí, J., & Murtinu, S. (2010). The Impact of Venture Capital on the Productivity of European High-Tech Firms: Screening or Value Added Effect? SSRN eLibrary.

Cruz, C., & Nordqvist, M. (2012). Entrepreneurial orientation in family firms: a generational perspective. Small Business Economics, 38(1), 33–49.

Dunn, B., & M. Hughes (1995). Themes and Issues in the Recognition of Family Businesses in the United Kingdom. Family Business Review, 8(4): 267-291.

Dyer Jr., W. (1988). Culture and continuity in family firms. Family Business Review, 1(1), 37–50.

Dyer, W.G. (2003). The family: the missing variable in organizational research. Entrepreneurship Theory and Practice, 27(4), 401–416.

Eckhardt, J.T., Shane, S., & and Delmar, F. (2006). Multistage Selection and the Financing of New Ventures. Management Science, 52(2), 220-232.

Eddleston, K.A., & Kellermanns, F.W. (2007). Destructive and productive family relationships: A stewardship theory perspective. Journal of Business Venturing, 22(4), 545–565.

Faccio, M., & Lang, L. (2002). The ultimate ownership of Western European corporations, Journal of Financial Economics. 65, 365–395.

Gersick, K.E., Davis, J.A., McCollom Hampton, M., & Lansberg, I. (1997). Generation to generation: Life cycles of the family business. Boston: Harvard Business School Press.

Gomez-Mejía , L.R., Cruz, C., Berrone, P., & Castro, J. de (2011). The Bind that Ties: Socioemotional Wealth Preservation in Family Firms. Academy of Management Annals, 5, 653–707.

Gomez-Mejía , L.R., Haynes, K.T., Núñez-Nickel, M., Jacobson, K.J.L., & Moyano-Fuentes, J. (2007). Socioemotional Wealth and Business Risks in Family-controlled Firms: Evidence from Spanish Olive Oil Mills. Administrative Science Quarterly, 52(1), 106–137.

Gomez-Mejía , L.R., Makri, M., & Larraza-Kintana, M. (2010). Diversification decisions in family-controlled firms. Journal of Management Studies, 47(2), 223–252.

Gorman, M., & Sahlman W.A (1989). What do venture capitalist do? Journal of Business Venturing, 4, 231–248.

Harvey, M., & Evans, R.E. (1994). Family business and multiple levels of conflict. Family Business Review, 7 (4), 331–348.

Haynes, J., & Usdin, T. (1997). Resolving family business disputes through mediation. Family Business Review, 10 (2), 115–134.

Hellmann, T., & Puri, M. (2002). Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence. Journal of Finance, 57(1), 169–197.

Horton, T.P. (1986). Managing in a family way. Management Review, 75(2), 3

Howorth, C., Wright, M., & Westhead, P. (2007). Succession, professionalization and the staying power of familiness: a longitudinal study of management buyouts of family firms. Frontiers of Entrepreneurship Research, 27(14), Article 1.

Hsu, D. (2006). Venture capitalists and cooperative start-up commercialization strategy, Management Science, 52, 204–219.

Itami, H. (1987). Mobilizing Invisible Assets. Boston, MA: Harvard University Press.

Jayaraman, N., Khorana, A., Nelling, E., & Covin, J. (2000). CEO founder status and firm financial performance. Strategic Management Journal, 21(12), 1215.

Johnson, W.B., Magee, R.P., Nagarajan, N.J., & Newman, H.A. (1985). An analysis of the stock price reaction to sudden executive deaths. Implications for the Managerial Labor Market. Journal of Accounting & Economics, 7(1/2/3), 151–174.

Kaplan, S., & Strömberg, P. (2003). Financial contracting theory meets the real world: An empirical analysis of Venture Capital contracts. Review of Economic Studies, 70(2), 281–315.

Kaye, K. (1991). Penetrating the cycle of sustained conflict. Family Business Review, 4(1), 21–44.

Lerner, J. (1995). Venture Capitalists and the oversight of private firms. Journal of Finance, 50(1), 301-318.

Lindsey, L. (2008). Blurring Firm Boundaries: The Role of Venture Capital in Strategic Alliances. The Journal of Finance, 63(3), 1137–1168. Journal of Finance, 63(3), 1137–1168.

López-Gracia, J., &S. Sánchez-Andújar (2007). Financial Structure of the Family Business: Evidence From a Group of Small Spanish Firms. Family Business Review, 20(4), 269-287.

Martí, J., Menéndez-Requejo, S., & Rottke, O.M. (2010). The Impact of Venture Capital on Family Businesses: Evidence from Spain. SSRN eLibrary.

Martí, J., Salas, M., & Alférez, A. (2011). Economic and social impact of venture capital and private equity in Spain. 2011. Madrid: ASCRI.

Martinez, J.I., Stohr, B.S., & Quiroga, B.F. (2007). Family Ownership and Firm Performance: Evidence From Public Companies in Chile. Family Business Review, 20(2), 83–94.

McConaughy, D.L., & Phillips, G. (1999). Founders versus descendents: The profitability, efficiency, growth characteristics and financing in large, public, founding-family-controlled firms. Family Business Review, 12(2), 123–131.

McConaughy, D.L., Walker, M.C., Henderson, G.V., JR., & Mishra, C.S. (1998). Founding family controlled firms: Efficiency and value. Review of Financial Economics, 7(1), 1-19.

Miller, D., & Le Breton-Miller, I. (2006). Family Governance and Firm Performance: Agency, Stewardship, and Capabilities. Family Business Review, 19(1), 73–87.

Myers (1977). Determinants of corporate borrowing. Journal of Financial Economics, 5(2), 147–175.

Myers, S. C., & Majluf, N. S. (1984). Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have. Journal of Financial Economics, 13(2), 187-221.

Olson, P.D., Zuiker, V.S., Danes, S.M., Stafford, K., Heck, R.K.Z., & Duncan, K.A. (2003). The impact of the family and the business on family business sustainability. Journal of Business Venturing 18 (5), 639–667.

Perez-Gonzales, F. (2006). Inherited Control and Firm Performance. American Economic Review, 96(5), 1559–1588.

Poutziouris, P. Z. (2001). The Views of Family Companies on Venture Capital: Empirical Evidence from the UK Small to Medium-Size Enterprising Economy. Family Business Review, 14(3), 277–291.

Poutziouris, P., & Sitorus S (2001). The financial structure and performance of family and non-family companies revisited: evidence from the UK private economy. The Family Business Network: 12th Annual World Conference. Helsinki.

Randøy, T., & Goel, S. (2003). Ownership structure, founder leadership, and performance in Norwegian SMEs: implications for financing entrepreneurial opportunities. Journal of Business Venturing, 18 (5), 619–637.

Reid, G.C. (1996). Fast growing small entrepreneurial firms and their venture capital backers: an applied principal–agent analysis. Small Business Economics, 8 (1), 1–14.

Robbie, K., Wright, M., & Albrighton, M. (1999). High-tech management buy-outs. Venture Capital, 1(3), 219–239.

Sahlman W.A (1990). The structure and governance of Venture Capital organizations. Journal of Financial Economics, 27(2), 473–521.

Salvato, C., & Melin, L. (2008). Creating Value Across Generations in Family-Controlled Businesses: The Role of Family Social Capital. Family Business Review, 21(3), 259–276.

Sapienza, H., Manigart, S., & Vermeir, W. (1996). Venture capitalist governance and value added in four countries. Journal of Business Venturing, 11, 439-469.

Scholes, L., Wright, M., Westhead, P., & Bruining, H. (2010). Strategic changes in family firms post management buyout: Ownership and governance issues. International Small Business Journal, 28(5), 505–521.

Schulze, W.S., Lubatkin, M.H., & Dino, R.N. (2003). Exploring the Agency Consequences of Ownership Dispersion among the Directors of Private Family Firms. Academy of Management Journal, 46(2), 179–194.

Sharma, P., Chrisman, J.J., & Chua, J.H. (1997). Strategic management of family business: past research and future challenges. Family Business Review, 10 (1), 1–35.

Shepherd, D., Douglas, E., & Shanley, M. (2000). New venture survival: ignorance, external shocks, and risk reduction strategies. Journal of Business Venturing, 15(5-6), 393–410.

Slovin, M.B., & Sushka, M.E. (1993). Ownership Concentration, Corporate Control Activity, and Firm Value: Evidence from the Death of Inside Blockholders. Journal of Finance, 48(4), 1293–1321.

Sonfield, M., & Lussier, R. (2004). First-, Second-, and Third-Generation Family Firms: A Comparison. Family Business Review, 17(3), 189–202.

Sraer, D., & Thesmar, D. (2007). Performance and behavior of family firms: evidence from the French stock market. Journal of the European Economic Association, 5(4), 709–751.

Tappeiner, F., Howorth, C., Achleitner, A.K., & Schraml, S. (2012). Demand for private equity minority investments: A study of large family firms. Journal of Family Business Strategy, 3, 38–51.

van Biesebroeck, J. (2007). Robustness of productivity estimates. Journal of Industrial Economics, 55, 529–569.

Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? Journal of Financial Economics, 80(2), 385–417.

Westhead, P. (2003). Company performance and objectives reported by first and multi-generation family companies: a research note. Journal of Small Business and Enterprise Development, (10 (1)), 93–105.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics, 126, 25–51.

Wright, M., & Kellermanns, F.W. (2011). Family firms: A research agenda and publication guide. Journal of Family Business Strategy, 2(4), 187–198.

Wright, M., Amess, K., Weir, C., & Girma, S. (2009). Private Equity and Corporate Governance: Retrospect and Prospect. Corporate Governance: An International Review, 17(3), 353–375.

Wright, M., Hoskisson, R.E., Busenitz, L.W., & Dial, J. (2001). Finance and management buy-outs: agency versus entrepreneurship perspectives. Venture Capital, 3 (3), 239–262.

Wright, M., Robbie, K., Thompson, S., & Starkey, K. (1994). Longevity and the life-cycle of management buy-outs. Strategic Management Journal, 15 (3), 215–227.

Zacharakis, A.L., & Meyer, D.G. (2000). The potential of actuarial decision models: can they improve the venture capital investment decision? Journal of Business Venturing, 15 (4), 323–346.

Table 1. Full sample of family and non-family VC-backed businesses.

Panel A. Breakdown by year of initial VC investment.

Year	*Family firms*		*Non-family firms*		*All*	
	Nº firms	*%*	*Nº firms*	*%*	*Nº firms*	*%*
1995	6	3.05	27	5.67	33	4.90
1996	9	4.57	25	5.25	34	5.05
1997	12	6.09	38	7.98	50	7.43
1998	26	13.20	34	7.14	60	8.92
1999	22	11.17	32	6.72	54	8.02
2000	26	13.20	68	14.29	94	13.97
2001	23	11.68	34	7.14	57	8.47
2002	15	7.61	34	7.14	49	7.28
2003	32	16.24	75	15.76	107	15.90
2004	10	5.08	62	13.03	72	10.70
2005	16	8.12	47	9.87	63	9.36
Total	197	100	476	100	673	100

Panel B. Breakdown by stage of development.

Stage	*Family firms*		*Non-family firms*		*All*	
	Nº firms	*%*	*Nº firms*	*%*	*Nº firms*	*%*
Early stage	30	15.23	158	33.19	188	27.93
Expansion	136	69.04	248	52.10	384	57.06
Later stage	31	15.74	70	14.71	101	15.01
Total	197	100	476	100	673	100

Panel C. Breakdown by activity sector.

Industry	*Family firms*		*Non-family firms*		*All*	
	Nº firms	*%*	*Nº firms*	*%*	*Nº firms*	*%*
Technology, Media & Telecom	10	5.08	80	16.81	90	13.37
Manufacturing	120	60.91	177	37.18	297	44.13
Primary and Energy	1	0.51	17	3.57	18	2.67
Services	66	33.50	202	42.44	268	39.82
Total	197	100	476	100	673	100

Source: Based on the information collected from ASCRI, www.webcapitalriesgo.com and the AMADEUS Database.

Table 2. Breakdown of VC-backed FCBs by size considering the generation in which the VC investor was involved.

Size reference	*1ST generation*		*Following generations*		*All*	
	Nº firms	*%*	*Nº firms*	*%*	*Nº firms*	*%*
Employees (Number)						
Under 10	20	17.86	14	16.47	34	17.26
Between 10 and 50	39	34.82	29	34.12	68	34.52
Between 50 and 250	40	35.71	29	34.12	69	35.03
Over 250	13	11.61	13	15.29	26	13.20
Total	112	100	85	100	197	100
Sales (Euro Million)						
Under 2	31	27.68	20	23.53	51	25.89
Between 2 and 10	41	36.61	25	29.41	66	33.50
Between 10 and 50	29	25.89	28	32.94	57	28.93
Over 50	11	9.82	12	14.12	23	11.68
Total	112	100	85	100	197	100

Source: Based on the information collected from ASCRI, www.webcapitalriesgo.com and the AMADEUS Database.

Table 3. Pre and post-investment descriptive statistics of company characteristics

Panel A. Family versus non-family VC-backed companies.

		PRE-INVESTMENT			POST-INVESTMENT		
		Family	*Non-family*	*Family vs. non-family*	*Family*	*Non-family*	*Family vs. non-family*
Total assets	Mean	16986.79	25546.69	-8559.90 ***	41046.37	39719.16	1327.21
	Median	5193	5790		10966	8602	
	Obs	973	1652		1343	3105	
Fixed assets	Mean	7102.01	13145.92	-6043.91 ***	22300.33	23628.70	-1328.37
	Median	1879	1888		4562	3381	
	Obs	973	1652		1343	3105	
Sales	Mean	17452.39	28921.94	-11469.55 ***	30939.10	35052.63	-4113.53
	Median	6011	5156		8747	6263	
	Obs	973	1652		1343	3105	
Payroll expenses	Mean	2832.62	4875.88	-2043.26 ***	5367.51	6465.76	-1098.25 *
	Median	1008	1208		1958	1560	
	Obs	973	1652		1343	3105	
Headcount	Mean	100.43	178.55	-78.12 ***	186.52	268.88	-82.37 **
	Median	42	43		66	51	
	Obs	973	1652		1343	3105	
Age	Mean	16.70	12.38	4.32 ***	21.26	15.08	6.18 ***
	Median	15	8		19	11	
	Obs	973	1652		1343	3105	

Panel B. VC-backed FCBs in first versus following generations.

		PRE-INVESTMENT			POST-INVESTMENT		
		1ST generation	*Following generations*	*1ST vs. following generations*	*1ST generation*	*Following generations*	*1ST vs. following generations*
Total assets	Mean	14054.23	21152.18	-7097.95 ***	32483.80	52482.98	-19999.18 ***
	Median	4623	6053		8704	14903	
	Obs	571	402		768	575	
Fixed assets	Mean	5858.06	8868.910	-3010.85 **	14681.18	32476.88	-17795.70 ***
	Median	1736	1968.5		3850	6277	
	Obs	571	402		768	575	
Sales	Mean	13547.35	22999.09	-9451.74 ***	24958.22	38927.47	-13969.25 ***
	Median	4706	7396		6630.5	11486	
	Obs	571	402		768	575	
Payroll expenses	Mean	2310.66	3574.01	-1263.35 ***	4688.97	6273.80	-1584.83 **
	Median	919	1185		1779.5	2296	
	Obs	571	402		768	575	
Headcount	Mean	90.02	115.21	-25.20 *	168.26	210.90	-42.64 *
	Median	41	44		66	65	
	Obs	571	402		768	575	
Age	Mean	13.02	21.92	-8.90 ***	17.65	26.07	-8.41 ***
	Median	12	20		17	24	
	Obs	571	402		768	575	

***, **, and * represent statistical significance of 1%, 5% and 10%, respectively. Data are expressed in thousand € and deflated by CPI (reference year: 2005).

Table 4. Pre and post-investment descriptive statistics of TFP growth estimations

Panel A. Family versus non-family VC-backed companies.

		PRE-INVESTMENT			POST-INVESTMENT		
		Family business	*Non-family business*	*Family vs. non-family*	*Family business*	*Non-family business*	*Family vs. non-family*
TFP growth	Mean	-0.040	0.028	-0.068 *	0.008	0.041	-0.033
	Median	-0.008	-0.003		-0.003	0.001	
	Obs	973	1652		1343	3105	

Panel B. VC-backed FCBs in first versus following generations.

		PRE-INVESTMENT			POST-INVESTMENT		
		1^{ST} generation	*Following generations*	*1^{ST} vs. following generations*	*1^{ST} generation*	*Following generations*	*1^{ST} vs. following generations*
TFP growth	Mean	-0.076	0.011	-0.087 **	0.028	-0.019	0.047
	Median	-0.016	0.000		-0.009	0.000	
	Obs	571	402		768	575	

***, **, and * represent statistical significance of 1%, 5% and 10%, respectively.

Table 5. Short and long term effects of VC on TFP growth in family and non-family VC-backed firms.

Panel A. Regresion results

	OLS		RE		GMM	
$VC_{i,t}^{pre} * d_{family_{g1}}$	-0.0999	***	-0.0999	***		
	(0.033)		(0.033)			
$VC_{i,t}^{pre} * d_{family_{gf}}$	0.0004		0.0004			
	(0.035)		(0.035)			
$VC_{i,t}^{short}$	0.0802	**	0.0802	**	0.0682	
	(0.034)		(0.034)		(0.058)	
$VC_{i,t}^{short} * d_{family_{g1}}$	-0.0082		-0.0082		0.4102	***
	(0.054)		(0.054)		(0.071)	
$VC_{i,t}^{short} * d_{family_{gf}}$	-0.0640		-0.0640		-0.2662	**
	(0.043)		(0.043)		(0.117)	
$VC_{i,t}^{long}$	0.0310		0.0310		0.0619	
	(0.030)		(0.030)		(0.07)	
$VC_{i,t}^{long} * d_{family_{g1}}$	0.0223		0.0223		0.4474	**
	(0.025)		(0.025)		(0.191)	
$VC_{i,t}^{long} * d_{family_{gf}}$	0.0000		0.0000		-0.3019	**
	(0.033)		(0.033)		(0.129)	
$Age_{i,t}$	-0.0016	***	-0.0016	***	-0.0051	
	(0.000)		(0.000)		(0.004)	
$Stage_i$	-0.0447	***	-0.0447	***		
	(0.013)		(0.013)			
Small size VCs_i	-0.0018		-0.0018		-0.0857	
	(0.021)		(0.021)		(0.078)	
Medium size VCs_i	0.0003		0.0003		-0.0686	
	(0.02)		(0.02)		(0.056)	
Intercept	0.2199		-0.0001			
	(0.164)		(0.057)			
N.obs.	7073		7073		6384	
N.firms	673		673		673	
Hansen test					95.7245 [92]	
AR1					-6.9491	***
AR2					1.4160	

Panel B. Wald tests

Short-term impact in first generation family firms	0,1720	**		0,1720	**		0,4784	***
	(0.071)			(0.071)			(0.0399)	
Long-term impact in first generation family firms	0,1533	***		0,1533	***		0,5094	***
	(0.039)			(0.039)			(0.1605)	
Short-term impact in following generations family firms	0,0158			0,0158			-0,198	*
	(0.057)			(0.057)			(0.108)	
Long-term impact in following generations family firms	0,0306			0,0306			-0,24	*
	(0.049)			(0.049)			(0.143)	
Difference in short-term impact (first generation vs. following generations family firms)	0,1562	*		0,1562	*		0,6764	***
	(0.086)			(0.086)			(0.122)	
Difference in long-term impact (first generation vs. following generations family firms)	0,1227	**		0,1227	**		0,7494	***
	(0.058)			(0.058)			(0.290)	

Estimates of Equation [1]. The dependent variable is total factor productivity growth. The independent variables are: (1) $VC_{i,t}^{pre}$ is a dummy variable that equals 1 prior to the year of the initial investment, or 0 otherwise; (2) $d_{family_{g1}}$ is a dummy variable that equals 1 in family firm i in first generation, or 0 otherwise; (3) $d_{family_{gf}}$ is a dummy variable that equals 1 for family firm i in second or following generations, or 0 otherwise; (4) $VC_{i,t}^{short}$ is a dummy that equals 1 in the first three years following the year of the initial VC investment, or 0 otherwise; (5) $VC_{i,t}^{long}$ equals 1 for later years (i.e. from t+4 onwards), and 0 otherwise; (6) $Age_{i,t}$ is the age of company *i* in year *t*; (7) $Stage_i$ is the stage of development (i.e. early, expansion or late stage) of company *i* at the time of the initial VC round; (8) is dummy that equals 1 if the investee company received funding from a VC investor with less than €50 million under management, or 0 otherwise; (9) is dummy that equals 1 if the investee company received funding from a VC investor with funds under management amounting between €50 and €150 million, or 0 otherwise. As shown in Section 3, the estimates of VC impact are shown in Panel B. OLS, RE and GMM columns refer to the estimations based on the full sample, including both family and non-family VC-backed firms. Estimates are derived from OLS and RE regressions with robust clustered standard errors and system GMM estimations. Standard errors in round brackets. Degrees of freedom in square brackets. ***, ** and * indicate, respectively, significance levels of <1%, <5% and <10%.

Table 6. Short and long term effects of VC on TFP growth in VC-backed FCBs across generations.

Panel A. Regression results

	OLS		RE		GMM	
$VC_{i,t}^{pre} * d_{family_{g1}}$	-0,0916	**	-0,0916	**		
	(0.041)		(0.041)			
$VC_{i,t}^{short}$	0,0220		0,0220		-0,0472	
	(0.06)		(0.06)		(0.038)	
$VC_{i,t}^{short} * d_{family_{g1}}$	0,0686		0,0686		0,4244	***
	(0.061)		(0.061)		(0.049)	
$VC_{i,t}^{long}$	0,0284		0,0284		0,0897	**
	(0.056)		(0.056)		(0.035)	
$VC_{i,t}^{long} * d_{family_{g1}}$	0,0353		0,0353		0,2615	***
	(0.039)		(0.039)		(0.047)	
$Age_{i,t}$	-0,0003		-0,0003			
	(0.001)		(0.001)			
$Stage_i$	0,0101		0,0101			
	(0.015)		(0.015)			
Small size VCs_i	-0,0290		-0,0290		0,0015	
	(0.028)		(0.028)		(0.058)	
Medium size VCs_i	-0,023		-0,023		-0,0817	**
	(0.026)		(0.026)		(0.036)	
Intercept	0,7631	***	-0,1356			
	(0.116)		(0.084)			
N.obs.	2316		2316		2114	
N.firms	197		197		197	
Hansen test					103.6018 [94]	
AR1					-3,0047	***
AR2					1,4047	

Panel B. Wald tests

Short-term impact in first generation family firms	0,1821	**	0,1821	**	0,3772	***
	(0.0764)		(0.0764)		(0.0257)	
Long-term impact in first generation family firms	0,1553	***	0,1553	***	0,3511	***
	(0.0438)		(0.0438)		(0.0345)	
Short-term impact in following generations family firms	0,0220		0,0220		-0,0472	
	(0.06)		(0.06)		(0.038)	
Long-term impact in following generations family firms	0,0284		0,0284		0,0897	**
	(0.056)		(0.056)		(0.035)	
Difference in short-term impact (first generation vs. following generations family firms)	0.1602	*	0.1602	*	0,4244	***
	(0.0846)		(0.0846)		(0.049)	
Difference in long-term impact (first generation vs. following generations family firms)	0.1269	**	0.1269	**	0,2615	***
	(0.0592)		(0.0592)		(0.047)	

Estimates of Equation [2]. The dependent variable is total factor productivity growth. The independent variables are: (1) $VC_{i,t}^{pre}$ is a dummy variable that equals 1 prior to the year of the initial investment, or 0 oterwise; (2) $d_{family_{g1}}$ is a dummy variable that equals 1 in FCB i in first generation, or 0 otherwise; (3) $VC_{i,t}^{short}$ is a dummy that equals 1 in the first three years following the year of the initial VC investment, or 0 otherwise; (4) $VC_{i,t}^{long}$ equals 1 for later years (i.e. from t+4 onwards), and 0 otherwise; (5) $Age_{i,t}$ is the age of company *i* in year *t*; (6) $Age_{i,t}$ is the age of company *i* in year *t*; (7) $Stage_i$ is the stage of development (i.e. early, expansion or late stage) of company *i* at the time of the initial VC round; (8) is dummy that equals 1 if the investee company received funding from a VC investor with less than €50 million under management, or 0 otherwise; (9) is dummy that equals 1 if the investee company received funding from a VC investor with funds under management amounting between €50 and €150 million, or 0 otherwise. As shown in Section 3, the estimates of VC impact are shown in Panel B. OLS, RE and GMM columns refer to the estimations based on the subsample of VC-backed FCBs. Estimates are derived from OLS and RE regressions with robust clustered standard errors and system GMM estimations. Standard errors in round brackets. Degrees of freedom in square brackets. ***, ** and * indicate, respectively, significance levels of <1%, <5% and <10%.

Table 7. Short and long term effects of VC on TFP growth in VC-backed FCBs across generations.

	First generation FCBs			Following generations FCBs		
	OLS	RE	GMM	OLS	RE	GMM
$VC_{i,t}^{short}$	0,1932 **	0,1932 **	0,1052 ***	0,0115	0,0115	0,0882 ***
	(0.084)	(0.084)	(0.032)	(0.064)	(0.064)	(0.033)
$VC_{i,t}^{long}$	0,1858 ***	0,1858 ***	0,0942 **	-0,0061	-0,0061	0,0951 ***
	(0.053)	(0.053)	(0.043)	(0.068)	(0.068)	(0.034)
$Age_{i,t}$	-0,0013	-0,0013		-0,0001	-0,0001	
	(0.002)	(0.002)		(0.001)	(0.001)	
$Stage_i$	0,0172	0,0172		0,0096	0,0096	
	(0.02)	(0.02)		(0.024)	(0.024)	
Small size VCs_i	-0,0445	-0,0445	-0,103	-0,0121	-0,0121	0,0645
	(0.028)	(0.028)	(0.106)	(0.055)	(0.055)	(0.065)
Medium size VCs_i	-0,0135	-0,0135	-0,0301	-0,0389	-0,0389	0,02
	(0.029)	(0.029)	(0.086)	(0.047)	(0.047)	(0.021)
Intercept	-0,1263	-0,3164 ***		0,5693 ***	-0,0039	
	(0.093)	(0.083)		(0.061)	(0.137)	
N.obs.	1339	1339	1226	977	977	888
N.firms	112	112	112	85	85	85
Hansen test			39.002 [51]			45.7915 [52]
AR1			-2,5887 ***			-1,5784
AR2			1,1652			1,096

Estimates of Equation [3]. The dependent variable is total factor productivity growth. The independent variables are: (1) $VC_{i,t}^{short}$ is a dummy that equals 1 in the first three years following the year of the initial VC investment in FCB, or 0 otherwise; (2) $VC_{i,t}^{long}$ equals 1 for later years in FCB, and 0 otherwise; (3) $Age_{i,t}$ is the age of company *i* in year *t*; (4) $Stage_i$ is the stage of development (i.e. early, expansion or late stage) of company *i* at the time of the initial VC round; (5) is dummy that equals 1 if the investee company received funding from a VC investor with less than €50 million under management, or 0 otherwise; (6) is dummy that equals 1 if the investee company received funding from a VC investor with funds under management amounting between €50 and €150 million, or 0 otherwise. OLS, RE and GMM columns refer to the estimations based on the subsample of VC-backed FCBs. Estimates are derived from OLS and RE regressions with robust clustered standard errors and system GMM estimations. Standard errors in round brackets. Degrees of freedom in square brackets. ***, ** and * indicate, respectively, significance levels of <1%, <5% and <10%.

Table 8. Pre and post-investment descriptive statistics of VC-backed vs non-VC-backed FCBs.

		PRE-INVESTMENT			POST-INVESTMENT			
		Non-VC-backed	*VC-backed*	*VC vs. non-VC-backed*	*Non-VC-backed*	*VC-backed*	*VC vs. non-VC-backed*	
Total assets	Mean	10616.030	11901.150	1285.120	13537.010	28076.090	14539.080	***
	Median	2446.000	4845.000		3205.000	10358.000		
	Obs	1136	977		552	998		
Sales	Mean	12343.320	11615.420	-727.900	5011.130	13025.190	8014.060	***
	Median	2988.500	5128.000		1034.000	4132.000		
	Obs	1136	977		552	998		
Payroll expenses	Mean	1917.071	2081.381	164.310	13839.820	21834.270	7994.450	***
	Median	494.500	892.000		3749.000	8215.500		
	Obs	1136	977		552	998		
Headcount	Mean	65.409	73.291	7.882	86.533	136.552	50.019	***
	Median	23.000	38.000		28.000	62.000		
	Obs	1134	977		552	998		
Age	Mean	15.528	15.719	0.190	20.109	19.915	-0.194	
	Median	13.500	13.000		18.500	18.000		
	Obs	1136	977		552	998		
TFP growth	Mean	-0.0002	-0.012	-0.012	-0.005	0.005	0.010	
	Median	-0.0004	-0.006		-0.005	0.004		
	Obs	1136	977		552	998		

***, **, and * represent statistical significance of 1%, 5% and 10%, respectively.

Table 9. Selection equation by VC in first and following generations FCBs.

	1^{ST} generation FCBs		Following generations FCBs	
$ge_{i,t}$	-0.1476	***	0.0049	
	(0.048)		(0.031)	
$Stage_i$	0.7407		-0.3477	
	(0.681)		(1.099)	
$Size_{i,t}$	1.6903	***	1.4261	***
	(0.395)		(0.446)	
Intangible On $Totalassets_{i,t}$	4.3178	**	5.0642	
	(1.825)		(3.831)	
$TFP\_growth_{i,t}$	-0.8429	*	0.3895	
	(0.502)		(0.977)	
d_industry	YES		YES	
d_year	YES		YES	
d_region	YES		YES	
N	1492		1172	
N_g	183		131	

The dependent variable is a dummy variable that equals 1 for VC-backed FCBs in the year of the initial investment, and 0 for non-VC-backed firms; $Age_{i,t}$ is the age of company *i* in year *t*; $Stage_i$ is the stage of development (i.e. early, expansion or late stage) of company *i* at the time of the initial VC round; Size is the logarithm of total assets of company *i* in year *t*; TFP $growth_{i,t}$ is the growth of total factor productivity of firm *i* in year *t*. The first column refers to the estimations based on the subsample of VC-backed FCBs in first generation. The second column refers to following generation FCBs. Estimates are derived from dynamic probit regressions. Standard errors in round brackets. ***, ** and * indicate, respectively, significance levels of <1%, <5% and <10%.