



The impact of venture capital on the productivity growth of European entrepreneurial firms: ‘Screening’ or ‘value added’ effect?

Annalisa Croce ^a, José Martí ^{b,*}, Samuele Murtinu ^c

^a Politecnico di Milano, via Lambruschini 4/b, 20156, Milano, Italy

^b Universidad Complutense de Madrid, 28223 Pozuelo de Alarcón, Madrid, Spain

^c Politecnico di Milano, via Lambruschini 4/b, 20156, Milano, Italy

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ABSTRACT

We aim to ascertain to what extent the better performance of European venture capital (VC)-backed firms in high-tech industries is due to either ‘screening’ or ‘value added’ provided by VC investors. We compare portfolio firms’ productivity growth before and after the first VC round, using a matched control group as benchmark. We show that productivity growth is not significantly different between VC and non-VC-backed firms before the first round of VC financing, whereas significant differences are found in the first years after the investment event. We also find that the value-adding services provided by VC investors ‘imprint’ the portfolio firm.

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1. Executive summary

Entrepreneurial firms may lack financial resources and managerial competences which are fundamental for their economic performance, especially when they operate in high-tech industries (Gans and Stern, 2003). In this respect, venture capital (VC) is considered by both academics and practitioners as one of the key drivers of the success of entrepreneurial firms. Several previous firm-level studies investigated the relationship between VC funding and firm performance. On average, they show that VC-backed firms grow faster, patent more, have higher productivity and are more likely to go public than non-VC-backed ones (Wright and Robbie, 1998).

However, the causality of the impact of VC on firm performance is still a pending research question (Gompers and Lerner, 2001). In other words, the superior performance of VC-backed firms (compared to non-VC-backed ones) might be (at least partially) explained by the ‘screening’ ability of VC investors. Moreover, even though screening is controlled for, it is important to understand how VC investors foster the performance of portfolio firms: is it the superior performance of VC-backed firms related to the VC funding received or to value-adding activities performed by VC investors? Finally, in the case of a significant ‘value-adding effect’ on portfolio firms’ performance, it is interesting to test whether this effect persists over time or fades away after a few years.

* Corresponding author. Tel.: +34 913942310; fax: +34 913942531.

E-mail addresses: annalisa.croce@polimi.it (A. Croce), jmartipe@ccee.ucm.es (J. Martí), samuele.murtinu@polimi.it (S. Murtinu).

In this work we aim to fill these gaps. First, to tackle reverse causality problems between VC and firm performance, we perform a matching procedure before the first round of VC funding and we estimate the impact of VC both before and after the first round of VC funding. Second, in order to isolate the 'value-adding effect' from the 'financial effect', we use different productivity growth measures as dependent variables. In fact, by scaling sales growth with the necessary growth in inputs, productivity measures allow us to control for VC funding injections that increase firms' inputs (capital and/or labor). Third, we test whether a value-adding effect exists and, if so, we verify whether VC investors are able to 'imprint' portfolio firms during their holding period. Finally, we test whether the value-adding effect is decreasing over time.

In the empirical section of the paper, we consider a sample of 696 entrepreneurial firms, 267 of which are VC-backed. They are located in six European countries: Belgium, Finland, France, Italy, Spain and the United Kingdom. This sample is extracted from the VICO dataset, a brand new firm-level longitudinal dataset sponsored by the European Union under the 7th Framework Program (for more details, see the official website at: <http://www.vicoproject.org>). For more details on the procedures used in the data gathering process and on all of the variables included in the dataset, see [Bertoni and Martí \(2011\)](#).

The econometric estimates show that VC-backed firms do not exhibit a significantly different productivity growth to that of their matched non-VC-backed counterparts before the first VC round, thus excluding a screening effect. This is not in line with some previous studies, mostly based on US manufacturing firms. This difference in screening abilities between US and European VC investors might be explained by the higher level of development of US VC market (than that of the European VC market). These results hold when we control for: i) the 'potentially different' growth orientation between VC-backed and matched non-VC-backed firms before VC funding; and ii) the reputation of VC investors. Conversely, productivity growth is significantly higher in VC-backed firms after the first VC round, so confirming a value-adding effect. Moreover, VC-backed firms do not exhibit a decrease in productivity growth measures after the exit of VC investors, suggesting an imprinting effect. Finally, the effect of VC seems to be persistent over time. Our findings are robust, as confirmed by a series of different robustness checks we ran.

To sum up, this study considerably extends our understanding of the impact of VC on the performance of European entrepreneurial firms in high-tech industries. From a policy perspective, this study reveals that VC is a valid tool for improving the performance of European entrepreneurial firms and indirectly to increase the dynamic efficiency of the economic system. Since the business environment in Europe makes it difficult for VC investors to successfully develop and exit entrepreneurial firms, incentive schemes should be further developed to enhance this type of investment.

2. Introduction

Venture capital (VC, henceforth) is generally considered by both academics and practitioners as the most suitable financing mode for entrepreneurial firms. The extant literature has shown how VC investors (VCs, henceforth) play a key role in the screening process ([Amit et al., 1998](#); [Chan, 1983](#); [Tyejbee and Bruno, 1984](#)), as well as in the post-investment monitoring of the portfolio firm ([Kaplan and Strömberg, 2003](#); [Lerner, 1995](#); [Sahlman, 1990](#)). VCs provide value-adding services ([Sapienza et al., 1996](#); [Sørensen, 2007](#)), such as coaching, mentoring and access to investment bankers, which could have signaling effects ([Megginson and Weiss, 1991](#)). Furthermore, VC-backed firms benefit from the network of contacts that may be provided by reputable, well-connected VCs ([Hsu, 2006](#); [Lindsey, 2008](#)).

Several previous studies evaluated the impact of VC on firm performance. In particular, some studies focused on different measures of firm growth, such as sales and employment growth (e.g. [Alemany and Martí, 2005](#); [Bottazzi and Da Rin, 2002](#); [Bottazzi et al., 2008](#); [Davila et al., 2003](#); [Gompers and Lerner, 2001](#)). Regarding productivity measures, [Alemany and Martí \(2006\)](#) used measures of partial productivity (i.e. capital and labor productivities), whereas [Chemmanur et al. \(2011\)](#) and [Colombo et al. \(2012\)](#) resorted to total factor productivity (TFP, henceforth).

However, as highlighted by [Gompers and Lerner \(2001\)](#), one of the pending research questions is the causality of the impact of VC on portfolio firm performance. In fact, the higher performance found in VC-backed firms is related to the presence of VCs in portfolio firm's equity capital, but it might also be explained by the attractiveness of firms with greater business opportunities. In other words, VC-backed firms might be better than non-VC-backed ones before the first round of VC financing. If this is true, then the higher performance of VC-backed firms can be (at least partially) explained by the 'screening' ability of VCs.

In addition, even though screening is controlled for, there could still be some doubts about how VCs foster the performance of portfolio firms. VCs not only provide financial resources but also contribute to enhancing firm performance through value-adding activities. Since the superior performance of VC-backed firms might be solely related to the funding received, which is not easily available to similar firms without VC backing, it is important to isolate these two ('financial' and 'value added') effects. [Balboa et al. \(2011\)](#) address this gap but they neglect to consider screening in their approach.

Furthermore, in the case of a significant value-adding effect on portfolio firms' performance, it is relevant to analyze whether this effect persists over time or fades away after a few years.

In this work we aim to fill these gaps. First, to tackle the abovementioned reverse causality problems, we propose a procedure that allows us to: i) reduce the selection bias problem in our sample by applying a matching procedure before the first round of VC funding; ii) control for reverse causality concerns by estimating the impact of VC both before and after the first round of VC funding. Secondly, in order to isolate the value-adding effect from the financial effect, we focus on productivity growth. In fact, by scaling sales growth with the necessary growth in inputs, productivity measures allow us to control for VC funding injections that increase firms' inputs (capital and/or labor). It is worth noting that considering only output indicators (e.g. growth in sales or employees) without any regard for the cost-side would give us only a partial and incomplete indication of firm performance, and this could lead to wrong conclusions about the net benefits due to VC involvement. As productivity reflects both output

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