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Founders' human capital and the growth of new technology-based firms: A competence-based view

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Abstract

In this paper, we analyze empirically the relation between the growth of new technology-based firms and the human capital of founders, with the aim of teasing out the "wealth" and "capability" effects of human capital. For this purpose, we take advantage of a new data set relating to a sample composed of 506 Italian young firms that operate in high-tech industries in both manufacturing and services. In accordance with competence-based theories, the econometric estimates show that the nature of the education and of the prior work experience of founders exerts a key influence on growth. In fact, founders' years of university education in economic and managerial fields and to a lesser extent in scientific and technical fields positively affect growth while education in other fields does not. Similarly prior work experience in the same industry of the new firm is positively associated with growth while prior work experience in other industries is not. Furthermore, it is the technical work experience of founders as opposed to their commercial work experience that determines growth. The fact that within the founding team there are individuals with prior entrepreneurial experiences also results in superior growth. Lastly, we provide evidence that there are synergistic gains from the combination of the complementary capabilities of founders relating to (i) economic-managerial and scientific-technical education and (ii) technical and commercial industry-specific work experiences. We conclude that the human capital of founders of new technology-based firms is not just a proxy for personal wealth.

JEL classification: M13; L25; O33

Keywords: New technology-based firms; Growth; Human capital; Entrepreneurship

1. Introduction

It is generally acknowledged in the economic literature that new firms, especially new technology-based firms (NTBFs), greatly contribute to the static and dynamic efficiency of the economic system (see for instance, Audretsch, 1995). So, a conspicuous body of empirical studies that will be surveyed in next section (see also Storey, 1994) has analyzed the determinants of their post-entry performances focusing attention on the role played by the human capital characteristics

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of founding teams. The likelihood of survival of new firms and the growth of surviving firms have generally been found to be positively related to the age, education, and work experience of founders. Nonetheless, this evidence is coherent with different arguments proposed by different streams of the theoretical literature in management, economics, and finance.

Studies in financial economics argue that due to capital market imperfections, it is difficult for NTBFs to obtain the external financing they need; in turn lack of adequate funds hinders firms' growth and even threatens survival (Carpenter and Petersen, 2002a,b). Firms that are established by wealthier individuals are less affected by financial constraints as greater personal capital is available to finance firms' operations. Previous studies have shown that there is a positive relation between the human capital and the wealth of individuals (Xu, 1998; Astebro and Bernhardt, 1999). Hence, the positive relation between the post-entry performances of NTBFs and the human capital of their founders may be traced to the "wealth effect" of human capital, simply revealing the presence of binding financial constraints.

Works inspired by the competence-based perspective suggest a different explanation. Hinging on the seminal contributions by Knight (1921) and Schumpeter (1934), this stream of literature argues that firms are bundles of unique, difficult to imitate capabilities.[1] Due to the idiosyncratic, non-contractible nature of entrepreneurial judgment and the high costs necessary to coordinate knowledge dispersed among different individuals (see Hodgson, 1998), the distinctive capabilities of NTBFs are closely related to the knowledge and skills of their founders. In turn, these depend on what founders learned through formal education and prior professional experience. Accordingly, NTBFs established by individuals with greater human capital should outperform other NTBFs because of their unique capabilities. In other words, it is the "capability effect" of founders' human capital that explains its positive impact on the performances of NTBFs.

Whether it is the "wealth effect" or the "capability effect" that determines the positive association between the growth of NTBFs and the human capital of their founding teams is an important though so far quite underresearched question. In fact, the implications for both entrepreneurs and policy makers widely differ. If the greater financial resources of high human capital individuals are the main determinant of the above mentioned association, the effort of entrepreneurs, and the attention of policy makers should prevalently be drawn to how to fill the so called "funding gap" (Cressy, 2000). Conversely, evidence that founders' unique knowledge and skills greatly contribute to growth indicates that how to fill the "knowledge gap" should be a key priority for entrepreneurs and policy makers.

The objective of this paper is to tease out empirically the "wealth" and "capability" effects of founders' human capital on the growth of NTBFs. For this purpose, we analyze the relation between the growth of NTBFs and the human capital characteristics of their founders through the estimates of several econometric models. As was mentioned above and will be illustrated in next section in greater detail, numerous studies have previously analyzed this issue. We depart from this literature in three respects.

First, we take advantage of a more fine-grained description of the human capital characteristics of founders than the one generally used by econometric studies based on large datasets. Following Becker (1975), a distinction is often made in the literature between the *generic* and *specific* components of human capital. Generic human capital relates to the general knowledge acquired by entrepreneurs through both formal education and professional experience. Specific human capital consists of capabilities that founders can directly apply to the entrepreneurial job in the newly created firm. These include knowledge of the industry in which the new firm operates, that is *industry-specific* human capital obtained by founders through prior work experience in the same industry. They also include knowledge of how to manage a new firm, that is *entrepreneur-specific* human capital; this is developed by founders through "leadership experience" (Brüderl et al., 1992) obtained either through a managerial position in another firm or in prior self-employment episodes. In this paper, we conform to this distinction. In addition, we consider the *nature* of both education (either technical and

[1] Distinctive capabilities consist in a firm's ability to select, mobilize, and use tangible and intangible assets to perform tasks in a unique way; they represent what a firm is able to do better than other firms (Winter, 1987; Prahalad and Hamel, 1990; Conner and Prahalad, 1996; Grant, 1996). In this work, we use the terms "competence" and "capability" as synonyms.