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Entrepreneurs' human capital and the start-up size of new technology-based firms

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Abstract

This paper investigates the determinants of the start-up size of new technology-based firms. While previous empirical studies generally focussed on industry-specific variables, we draw attention to the characteristics of founders, notably their human capital. In the empirical section, we consider a sample of 391 young Italian firms operating in high-tech industries in both manufacturing and services. The econometric estimates confirm the explanatory power of the industry-specific effects highlighted by previous work. In addition, they indicate that the human capital of founders figures prominently in explaining the firms' start-up size. Furthermore, the specific component of human capital associated with industry-specific professional knowledge and managerial and entrepreneurial experiences is found to have a greater positive impact on the initial firm size than the generic component, proxied by education and general (i.e., non-industry-specific) working experience.

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1. Introduction

Since the early 1980s, a rich stream of empirical literature has analysed the determinants of new firm creation and the postentry performances of new firms (for a survey, see [Geroski, 1995](#); [Sutton, 1997](#); [Caves, 1998](#)). Such studies have established several interesting “stylised facts”. First, although new firms are very numerous, they generally are much smaller than incumbents ([Cable and Schwalbach, 1991](#)). Second, in the years that immediately follow foundation mortality rates are very high among newly born firms; however, they decline with start-up size. In other words, the higher the initial size of a new firm, the higher the probability of survival, all else equal ([Evans, 1987a, b](#); [Dunne et al., 1988, 1989](#); [Philips and Kirchoff, 1989](#); [Audretsch, 1991](#); [Mata and Portugal, 1994](#); [Audretsch and Mahmood, 1994, 1995](#); [Mata et al., 1995](#); [Audretsch, 1995b](#); [Cabral and Mata, 2003](#)). Third, Gibrat’s law claiming that firms’ growth rates are independent of firm size has been found not to hold for young firms. Studies relating to different countries and industries have shown that smaller new firms exhibit significantly higher growth rates than their relatively larger counterparts (see [Evans, 1987a, b](#); [Dunne et al., 1988, 1989](#); [Hart and Oulton, 1996](#)). This result is generally interpreted as a consequence of the need to eliminate as rapidly as possible the cost disadvantage accruing from operating at suboptimal scale. The fact that the survival prospects of new firms are generally found to be lower and the growth rates of new surviving firms to be greater in industries where there are substantial economies of scale lends support to such view (see, for instance, [Audretsch and Mahmood, 1994](#); [Audretsch, 1995b](#). For a different view, see [Mata and Portugal, 1994](#)).¹

If a larger start-up size positively affects the likelihood of survival of new firms and if surviving new firms that started operations at smaller scale struggle to catch up, the question arises why there are firms with small initial size. Unfortunately, the analysis of the determinants of the size of new firms has so far remained rather undeveloped.

A few empirical studies have tried to relate the initial scale of firms to specific characteristics of the industry in which they are going to operate ([Mata, 1996](#); [Mata and Machado, 1996](#); [Görg et al., 2000](#)). Such studies show that start-up size increases with the minimum efficient scale (MES) of the industry, the cost disadvantage of operating at suboptimal scale, and industry growth, while it diminishes with the entity of sunk costs, inversely measured by the easiness of entry into and exit from the industry. The impact of market size is more controversial, being positive but weakly significant in [Mata \(1996\)](#) and [Mata and Machado \(1996\)](#) and prevalently negative in [Görg et al. \(2000\)](#). Note that both [Mata and Machado \(1996\)](#) and [Görg et al. \(2000\)](#) acknowledge that there is size heterogeneity among new firms in a given industry; however, the sources of heterogeneity generally remain unobserved due to lack of proper data at firm level.

¹ As regards Italy, [Audretsch et al. \(1999\)](#) estimate models for survival and growth of firms born in January 1987 and tracked up to January 1993. They find virtually no evidence of a positive relation between firm’s initial size and survival (similarly insignificant results are obtained by [Wagner, 1994](#) for Germany). However, they do find that in most industries, smaller new firms grow at higher rates than larger ones.

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