The Organizational Design of High-Tech Entrepreneurial Ventures

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Abstract

The majority of the theoretical and empirical work in the field of organizational design has focused on large established companies, disregarding entrepreneurial ventures, although the organization of these firms is of paramount importance to their functioning and performance. This monograph aims to fill this gap by taking stock of extant knowledge and suggesting future research on the organizational design of high-tech entrepreneurial ventures. To this end, we take the following steps. First, we illustrate how the fact that high-tech entrepreneurial ventures operate in high-velocity environments and base their competitive advantage on human capital influences their organizational design. Second, we briefly sketch the theories that we deem most pertinent to the study of the organizational design of high-tech entrepreneurial ventures. Third, we review the handful of studies that have examined the main structural elements (that is, hierarchy, delegation decision of authority, specialization, and formalization) and human resource management practices of high-tech entrepreneurial ventures. Finally, we acknowledge that these firms are heterogeneous across some relevant dimensions: the appropriability regime they face, the business models they adopt, and the identities of the entrepreneurial team's members. Accordingly, we discuss how the organizational design of high-tech entrepreneurial ventures varies depending on aforementioned dimensions.

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1

Introduction

To date, research on organizational design has focused primarily on established firms, with a few exceptions (notably, the works of the Stanford Project of Emerging Companies, SPEC Project.[1] See Baron and Hannan, 2002, for a synthesis of the main results). This work focuses on the *organizational design of entrepreneurial ventures*. We here define these ventures as young, independent firms established by one or more individuals with the aim to commercially exploit a novel business idea (see, for example, Storey and Tether, 1998, Hart, 2003). While many definitions of organizational design exist (see for example, Galbraith, 1977, Thompson, 1967, Jones, 2010), we consider it as consisting of two main dimensions.

The first is the *organizational structure* of the firm [Pugh et al., 1968, Mintzberg, 1979]. Under this heading, we include several elements. Specifically, we take into account: (i) the presence of hierarchical

[1] A group of researchers at Stanford University established the Stanford Project of Emerging Companies (SPEC) in the early 1990s. The SPEC examines the evolution of the organization, employment practices, and business strategies of high-tech entrepreneurial ventures located in Silicon Valley. Among other things, the project sought to understand how high-tech entrepreneurial ventures design their organizational structures.

relations within the entrepreneurial team and between team members and salaried workers (including salaried managers); (ii) the allocation of decision authority on key strategic and operating decisions[2]; (iii) the functional specialization of a firm's entrepreneurial team[3]; (iv) the formalization of a firm's organization, including the specification of formal roles and the presence of written rules, procedures and communication mechanisms. The second dimension consists of *human resource management practices* (hereafter HRMPs); that is, practices for recruiting, training and retaining employees [Cardon and Stevens, 2004]. The human capital of founders and key employees, as reflected in the knowledge and skills they developed through education and work experience, is usually the most fundamental asset of entrepreneurial ventures [Bruderl et al., 1992, Colombo and Grilli, 2005, Sharader and Siegel, 2007]. Consequently, the HRM practices crucially influence firm performance.

The mainstream scholarly view is that it is not worthwhile to study the organizational design of entrepreneurial ventures because these firms have a simple organization [Mintzberg, 1979]. In the context of entrepreneurial ventures, agency and information costs are negligible. Thus, for these firms developing complex organizations is not necessary and quite inefficient. We disagree with this general belief [Colombo and Rossi-Lamastra, 2013]. Many of these firms are founded by an *entrepreneurial team* [Chowdhury, 2005, Reuf et al., 2003]; that is, a group of owners holding key positions in the strategic decision-making

[2]Strategic decisions include, for example, the launch of new products and services, entry into a foreign market, or investments in research about a new technological field. Operating decisions regard managing the workforce (for example, decisions on hiring, firing, and career progress), staffing research projects, deciding production schedule, and so on.

[3]In most high-tech entrepreneurial ventures, especially in the early stage of their life, the entrepreneurial team, composed of the firm's owner managers, makes the key decisions for firm's survival and success. In this context, firm's top management team coincides with the entrepreneurial team. Inclusion in the top management team of salaried managers (that is, managers who do not own shares of the equity capital of the firm, altough they may receive stock options) is rare, except in the larger ventures. Therefore, for the sake of synthesis, in what follows we disregard these cases (with only one exception, see Section 5.3) and refer to the entrepreneurial team as a synonym of the top management team.

of the venture [Ucbasaran et al., 2003]. To establish and run their businesses, founders must make several important choices related to their ventures' organizational design [Alvarez and Barney, 2005, Meijaard et al., 2005], whose antecedents and performance consequences deserve further investigation. In other words, founders are the "first architects" of the venture they establish: they design it based on their own characteristics, competencies, and social relationships [Baron et al., 1999a, p. 4]. These early design choices are of fundamental importance as they become imprinted in the venture and shape its subsequent evolution [Baron et al., 1999b]. Founders must decide whether to establish a hierarchy within their team, who is at the top of this hierarchy, who has the authority to make decisions and on which matters, whether to formalize managerial roles and draft written procedures for ruling operations, which human resources management practices to adopt for attracting and retaining employees, and so on.

Meijaard et al. [2005] examine the organization of entrepreneurial ventures in an effort to determine diverse *organizational configurations*; that is, combinations of organizational design elements such as departmentalization (U-form compared with M-form), specialization, allocation of decision authority over strategic and operating decisions, formalization, and coordination mechanisms. The authors observe that entrepreneurial ventures come with a wide range of organizational configurations, and variance exists across industries and size classes. As explained below, scattered empirical evidence supports the view that organizational design choices are important in the context of entrepreneurial ventures. Given the limited number of prior contributions in this domain, studying the organizational design of these firms is a promising research avenue in the entrepreneurship field.

Research in this domain is also interesting because the peculiarities of entrepreneurial ventures prevent generalizing results of the organizational design of established firms. To survive and build a sustainable competitive advantage, entrepreneurial ventures rely primarily on the skills of their founders [Colombo and Grilli, 2005, Sharader and Siegel, 2007] who often lack managerial competencies. Indeed, these firms encounter severe difficulties in hiring professional managers due to their financial constraints [Hall, 2002, Bertoni et al., 2010] and poor legitimacy [Zimmerman and Zeitz, 2002]. In addition, sources of agency costs are different in entrepreneurial ventures from their established counterparts, while governance plays a different role [Bertoni et al., 2013, Audretsch and Lehmann, 2014]. Specifically, entrepreneurial ventures suffer from horizontal principal–principal costs rather than vertical agency costs [Young et al., 2008] and have simple governance mechanisms, which serve the purpose of attracting resources rather than monitoring managers [Ambos and Birkinshaw, 2010]. Therefore, the study of entrepreneurial ventures' organizational design requires the development of new interpretative models. This work makes a first step in this direction by taking stock of the current debate on the topic and suggesting some promising avenues for future research.

For the sake of relevance, we focus our attention on entrepreneurial ventures operating in high-tech industries (hereafter, *high-tech entrepreneurial ventures*). Indeed, as we explain in the following section, these firms have characteristics that generate salient organizational challenges and require appropriate design choices. First, high-tech entrepreneurial ventures operate in *high-velocity environments* [Bourgeois and Eisenhardt, 1988] where rapid changes require decision-makers to timely process a large amount of information and cope with uncertainty. Moreover, most high-tech entrepreneurial ventures are founded by *teams of high-skilled individuals* (see, for example, Colombo and Grilli [2005]), who, in turn, hire highly skilled employees. The human capital of founders and key employees, as reflected in their education and work experience (Becker [1994], see also Campbell et al. [2012]), is the main source of competitive advantage for these firms but creates major organizational challenges.

Figure 1.1 provides a roadmap of the monograph. Section 2 illustrates the general contextual characteristics of high-tech entrepreneurial ventures that pose organizational design challenges, which differ from those of both incumbent firms and low-tech ventures. Then, we present the state of the art on the main dimensions of high-tech entrepreneurial ventures' organizational design. In particular, Section 3 focuses on the relevant elements of organizational structure (that

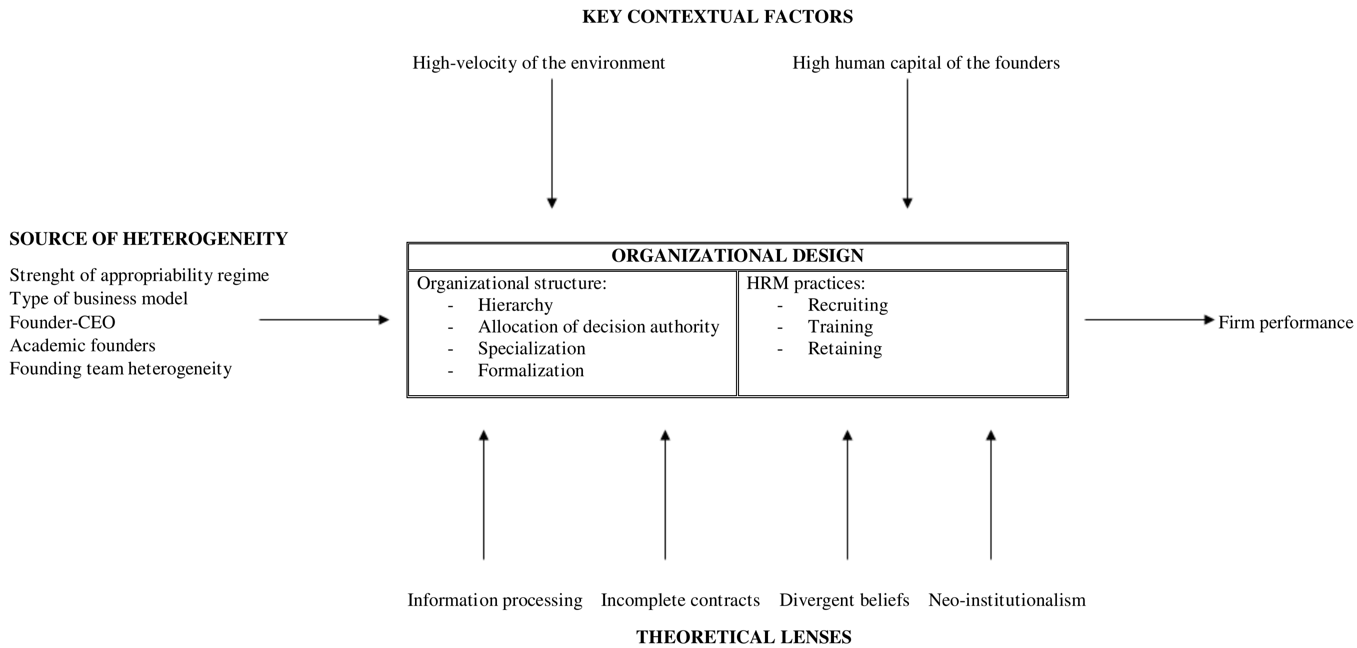

Figure 1.1: A roadmap for the study of the organizational design of high-tech entrepreneurial ventures.

is, hierarchy, allocation of decision authority, functional specialization, and formalization), while in Section 4, we review the literature on HRM practices. In Section 5, we move from the premise that high-tech entrepreneurial ventures are heterogeneous across several dimensions and highlight prominent factors that shape their organizational design. Because many diverse factors may affect the design choices of these firms, we made a selection. For the sake of relevance, we focus on the following factors. In Section 5.2, we consider the *appropriability* of firms' technology; that is, how easily entrepreneurial ventures can protect their proprietary technology through patents and other mechanisms [James et al., 2013], also distinguishing the pre- and the post-patenting phases. In Section 5.3, we assess the role of the *business model* that high-tech entrepreneurial ventures choose, focusing in particular on the choice between a closed and an open business model [Chesbrough, 2003]. In Section 5.4, the *characteristics of the individuals* who compose the entrepreneurial team do matter. In this latter regard, we distinguish between entrepreneurial ventures whose CEO is one of the founders from ventures that have a professional manager as CEO (see, for example, Wasserman [2008]). In Section 5.5, we consider entrepreneurial ventures founded by academic personnel (that is, *academic start-ups*, see, for example, Rothaermel et al. [2007]). Finally, we illustrate the organizational implications of the heterogeneity of the founding team (see, for example, Klotz et al. [2014]). Section 6 concludes the monograph by summarizing its main points and suggesting directions for future research.

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