Top Managers in Entrepreneurial Firms: Who is running the show?[1]

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Abstract

New venture teams have a strong impact on firm performance, and researchers have long been interested in understanding how entrepreneurs select co-founders and early employees. In this paper, we examine how entrepreneurs choose top managers for their ventures. Founders often lack the necessary skills and motivation for managing their firms personally and hire professional managers instead. We find, however, that entrepreneurs have a strong tendency to hire managers who are similar to them, even when this may negatively affect firm performance. Our results are consistent with the idea that founders choose managers with similar demographic characteristics, such as age, nationality, and education, due to homophily. Yet they hire managers with similar industry experience because such similarity is good for the firm.

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Introduction

The rise of small businesses is one of the driving forces of today's economy (Sahlman 1999). New ventures are responsible for creating jobs, increasing innovation, and changing the established paradigm in an industry (Schumpeter 1949). In developed countries and emerging markets, small businesses constitute more than 90 percent of all organizations and employ more than 40 percent of the labor force (European Commission 2013; Fiscal Policy Institute 2012; McKenzie and Woodruff 2016; Small Business Administration 2014). However, the long-term prospects of these businesses are uncertain. While some start-ups grow into large, successful organizations, the majority of ventures remain small and short-lived (Campbell 2013; Small Business Administration 2014).

One important determinant of the new firm's survival and growth is the human capital of its founding team, the impact of which may extend long beyond the early start-up years (Clarysse and Moray 2004; Eisenhardt and Schoonhoven 1990; Huang and Pearce 2015; Shane and Stuart 2002). Given the vital nature of the new-venture teams, researchers have paid significant attention to their formation and accumulation of human capital (e.g., Beckman and Burton 2008; Ruef, Aldrich, and Carter 2003). Yet earlier studies often focused just on the founders' human capital or treated all individuals working in a new venture as equal team members and did not account for different roles that they play in the start-up. Recent work calls for a more nuanced approach to studying team composition, particularly in respect to co-founders and early employees (Rocha et al. 2016). Co-founders and hired employees may have very different motives for joining the firm and may be selected based on distinct criteria (Burton, Anderson, and Aldrich 2008; Chen 2013; Roach and Sauermann 2015). Founders' preferences for certain team members may also depend on the functional roles of these members. Entrepreneurs, for example, will likely prioritize different characteristics in candidates for managerial vs. engineering positions.

In this paper, we contribute to the entrepreneurship literature by examining how founders choose top managers for their firms. We find it important to understand the hiring preferences of entrepreneurs for top executives since top managers play a key role in young ventures and their imprinted influence continues even beyond their tenure at the firm (e.g., Beckman and Burton 2008; Eesley, Hsu, and Roberts 2014; Graffin, Boivie, and Carpenter 2013; Miller, Minichilli, and Corbetta 2013; Nelson 2003).

Despite its importance, the choice of manager in an entrepreneurial venture is not yet well understood. Until recently, entrepreneurship literature has traditionally assumed that founders manage their start-ups personally (e.g., Berglann et al. 2011; Hamilton 2000; Nanda and Sorensen 2010). Yet recent evidence suggests that this is not always the case (Beckman and Burton 2008; Chen and Thompson 2015; Clarysse and Moray 2004; Kulchina 2016). Up to 40 percent of founders in the United States and Europe rely on hired CEOs at the time of founding (e.g., Kulchina and Gjerløv-Juel 2017; Kulchina and Oxley 2017; McKenzie and Woodruff 2017) and a significant share of the remaining founders hire professional managers by the time of a major financing event and IPO (e.g., Clarysse and Moray 2004; Wasserman 2003).

Entrepreneurs are, indeed, often considered suboptimal managers for their firms: They are criticized for the lack of business experience and for being motivated by personal desire for control and other non-pecuniary benefits rather than by profit maximization (e.g., Dahl and Sorenson 2010; Gomez-Mejia et al. 2007; Kulchina 2016; Wasserman 2017). Yet when founders decide to delegate managerial responsibilities to hired agents, these agents also frequently fail to perform, perhaps due to misaligned manager choice (e.g., Clarysse and Moray 2004; Kulchina 2016).

In this paper, we aim to understand how founders choose their hired top managers. Do they select individuals who are best for the firm or who the founders are comfortable working with on the personal level? We build on the literature on team composition (e.g., Beckman and Burton 2008; Fern, Cardinal, and O'Neill 2012; Pelled and Eisenhardt 1999; Ruef et al. 2003) to examine whether founders hire managers who are similar to or different from them, explore key mechanisms responsible for the founders' choice, and investigate performance implications of the founders' hiring decisions.

In doing so, we focus on key demographic characteristics and relevant experiences. Using the prior literature, we develop and empirically examine a set of competing hypotheses: Thus some studies suggest that entrepreneurs may be more likely to hire managers who are similar to them due to homophily (or the desire to bond with similar others) or network constraints, or because similarity leads to efficient coordination (e.g., Aldrich and Kim 2007; Brown and Eisenhardt 1997; Hart 2014; Knight et al. 1999; Ruef et al. 2003). Other studies imply that entrepreneurs would tend to hire managers with different characteristics in search for unique resources, non-redundant social capital, and novel ideas (e.g., Eesley et al. 2014; Hooogendoorn, Oosterbeek, and van Praag 2013; Randel and Jaussi 2003). Furthermore, entrepreneurs may prefer managers with the demographic characteristics that are positively associated with start-up performance and are considered superior, such as male gender, older age, higher education, and relevant experience (e.g., Dahl and Sorenson 2012; Dencker and Gruber 2015; Shane and Stuart 2002).

To empirically test these predictions, we use unique employer-employee matched data on Portuguese entrepreneurs who started their firms between 1991 and 2009. The database provides detailed information on entrepreneurs, employees, and their firms. It gives us the opportunity to track personal characteristics and career histories of individuals, and, importantly for our study, it allows us to distinguish between founders and hired top managers. In line with the prior literature, we focus on eight key characteristics of managers: gender, age, education, foreign origin, prior industry experience, managerial experience, experience in the region, and entrepreneurial experience. The studies of founder-managers have demonstrated that these characteristics are positively associated with start-up performance (e.g., Campbell 2013; Dahl and Sorenson 2012; Shane and Stuart 2002), and it is reasonable to expect that they are also beneficial for hired managers. We examine how the founder's choice of manager varies along these characteristics.

We find that founders have a strong tendency to hire managers who have the same characteristics as the founders themselves. Thus, founders with superior characteristics have a tendency to hire managers with superior characteristics, whereas founders who lack such characteristics are more likely to hire managers with similarly non-superior characteristics. For example, founders with higher education are more likely to hire managers with more advanced education, whereas founders with few years of education are more likely to hire less educated managers; foreign founders are more likely than domestic founders to hire foreign managers; founders with prior relevant experience are more likely to hire managers with similar experience, whereas founders without prior relevant experience tend to hire inexperienced managers. Our evidence is also consistent with the idea that the tendency to hire similar managers is largely driven by homophily, or founders' psychological preference for working with people who are similar to them, even when such choice reduces firm performance.

One notable exception is gender: Female founders are significantly more likely to hire male managers than male founders. Male managers are also more positively associated with firm performance in ventures founded by women than in firms founded by men. Another interesting observation is that only a third of all founders find managers among recent coworkers, despite the fact that the literature expects new entrepreneurs to start ventures with former colleagues (e.g., Aldrich and Kim 2007; Campbell et al. 2012; Ruef et al. 2003). Finally, we observe a negative association between firm performance and manager's regional experience that some prior studies have considered desirable for entrepreneurs. This may be due to the fact that managers with prior regional experience are driven by non-pecuniary preferences for working at a start-up.

Taken together, our findings speak to several areas of the entrepreneurship literature. First, they directly contribute to the literature on founding team formation (e.g., Beckman and Burton 2008; Ruef et al. 2003) and the growing research on management of new ventures founded by entrepreneurs (e.g., Beckman and Burton 2008; Chen and Thompson 2015; Kulchina and Oxley 2017; Eesley et al. 2014; McKenzie and Woodruff 2017; Wasserman 2017). Overall, our results suggest that founders strongly prefer to hire managers who are similar to them. This means that firms founded by entrepreneurs with non-superior characteristics may be particularly disadvantaged.

These findings may also shed light on the prior empirical puzzles. First, entrepreneurs are often criticized for not being the best managers for their firms. However, when they decide to hire managers, such managers sometimes also fail to do well. Our findings suggest that while the intentions for hiring a manager may be good, the choice of manager may be misaligned with firm performance, particularly for founders who lack firm-operating skills and valuable resources and are particularly in need of managerial help. Second, prior studies have found contradicting results for the impact of team diversity. This may be due to the fact that those studies typically estimated an average effect across all teams, whereas we find that the effect may vary for founders with superior and non-superior characteristics and, therefore, sample composition may determine which group dominates and determines the average effect.

Furthermore, our study points to a number of interesting regularities and opens a broad avenue for future research. For example, contrary to the popular expectation that individuals strongly prefer gender homophily, we find that female founders have a strong preference for male managers. We also find that a manager’s industry experience is only beneficial for experienced founders. Additionally, we observe that only a third of the managers are former coworkers of entrepreneurs, which calls for further investigation of which colleagues future entrepreneurs are more likely to take with them when they leave. It is also worth exploring under which conditions founders are more likely to be driven by personal preferences versus more strategic considerations.

Finally, our study speaks to the growing literature on the role of entrepreneurs in their firms (e.g., Kor 2003). Prior work has largely treated an entrepreneur as a person who combines founding and managerial responsibilities. However, individuals do not always simultaneously possess great founding and managerial skills. It is important to understand which characteristics are important for founding a promising firm and for successfully managing it. Our paper helps separate founders and managers and provides some suggestions on how founders may be able to compensate for the lack of relevant human capital by hiring particular managers. However, further research is needed to understand the relative importance of personal attributes for founding and managing a firm.

Theoretical Background

Founding teams and top managers in small businesses

The work on the founding team composition has been developing along two lines. One stream of research examines whether people prefer to engage in entrepreneurship with similar individuals and how team homogeneity affects firm performance (e.g., Beckman and Burton 2008; Fern et al. 2012; Pelled and Eisenhardt 1999; Ruef et al. 2003). Two individuals are considered similar when they share the same demographic characteristics, such as gender, age, and nationality, and have similar backgrounds. Another set of studies takes individual team characteristics, such as education or relevant experience, and examines whether teams that are superior on these characteristics do better than others (e.g., Burton et al. 2008; Delmar and Shane 2006).

The empirical evidence on the effect of team composition on firm performance and the relative importance of a particular individual’s characteristics has, however, been mixed (e.g., Delmar and Shane

2006; Fern et al. 2012). Delmar and Shane (2006) and Burton et al. (2008), for example, demonstrate that founding teams with greater industry experience and education survive longer and have higher sales. Yet the authors find no similar effect of entrepreneurial experience. Another set of studies show that founding teams with heterogeneous capabilities and experiences seem to have better outcomes (Beckman and Burton 2008; Eisenhardt and Schoonhoven 1990; Fern et al. 2012; Hamilton, Papageorge, and Pande 2014), whereas demographic diversity provides inconsistent impacts. For example, Hamilton et al. (2014) and Chowdhury (2005) find no robust positive effect of demographic diversity on venture productivity and team effectiveness, whereas Hoogendoorn, Oosterbeek, and van Praag (2013) demonstrate that gender diversity leads to superior entrepreneurial team performance.

Even though prior studies suggest that diverse teams may benefit their start-ups by broad skills, comprehensive information, and access to a variety of resources, entrepreneurs themselves have a preference for homogeneous rather than diverse teams. Ruef et al. (2003) found that start-up teams are likely to be composed of individuals with similar gender, ethnicity, and prior occupation, presumably because founders like working with similar others. Steffens, Terjesen, and Davidsson (2012) also show that founding team members are likely to be similar in gender, age, and start-up experience, but find no positive association between team homogeneity and firm performance. Conversely, Brown and Eisenhardt (1997) demonstrate that homogeneous teams may provide performance advantages since teams composed of similar members are more efficient at making and executing decisions.

One possible explanation for such mixed empirical findings is the definition of the founding team being quite vague. Empirical studies typically consider all individuals working in the new venture as one team, regardless of whether they are co-founders or early employees (see Burton et al. (2008) and Klotz et al. (2014) for review). However, founders and hired employees may have different preferences for joining a start-up and may be selected based on different criteria (e.g., Roach and Sauermann 2015). As a result, these two groups of individuals may have very different characteristics. For example, Burton et al. (2008) and Chen (2013) show that co-founders are more similar to each other than to hired employees. Another potential drawback is that prior work has rarely accounted for the functional roles of team members, whereas different responsibilities may require individuals with different human and social capital.

In this paper, we address both of the above caveats and contribute to the entrepreneurship literature by examining entrepreneurs' choice of one particular founding team member—a hired chief executive officer (CEO). Top managers are believed to be key players in small businesses and, therefore, their selection should be done with particular scrutiny. We focus on top managers who enter a firm close to the time of founding, since early managers have profound and long-lasting impact on venture success and survival (e.g., Beckman and Burton 2008; Eesley et al. 2014; Miller et al. 2013; Nelson 2003).

First, we distinguish between founders and hired CEOs. In line with the prior literature, we define a ***founder*** as a person who developed the business idea, founded the firm, and owns a significant share of it (Aldrich and Waldinger 1990; Burton et al. 2008; Eesley et al. 2014; Hmieleleski, Carr, and Baron 2015). A ***hired top manager*** is a hired employee who is actively involved in operating the firm but does not own a significant share of it (Kulchina 2016). In firms with hired CEOs, founders are still expected to actively engage in building high-level firm strategy, but they are less engaged in strategy implementation, coordination of day-to-day operations, and hiring non-managing employees.

While entrepreneurship literature has typically assumed that in the early years founders operate their firms themselves, recent empirical studies show that this is not always the case. Thus Beckman and Burton (2008) examine the evolution of top-management teams in Silicon Valley high-technology start-ups and note that founders do not always hold management positions in their firms. Kulchina (2016) and Kulchina and Oxley (2017) demonstrate that close to 40 percent of young entrepreneurial businesses in Russia have hired CEOs. Kaplan, Sensoy, and Stromberg (2009) study 50 young US firms in the knowledge-based industries and demonstrate that 34 percent of them already had a hired CEO at the business plan stage.

Indeed, prior literature suggests that founders are not always the best managers for their ventures. They may lack operational knowledge and skills and make strategic decisions based on their non-pecuniary preferences rather than profit maximization (Chen and Thompson 2015; Wasserman 2017). Kulchina and Gjerløv-Juel (2017) examine what motivates founders to delegate firm operation to a hired manager and find that founders are more likely to do so when they lack relevant knowledge and skills, have attractive outside employment, and assign low value to the non-pecuniary benefits of owner-management, such as schedule flexibility. Founders who hire CEOs to operate their firms may work in a firm at another position, hold an outside job, or, in rare cases, not work at all (Kulchina and Gjerløv-Juel 2017).

In our study, we focus on founders who hire CEOs in their start-ups in the first few years after founding and examine which individuals they tend to hire as top managers for their ventures. We examine hiring decisions made in the first few years after founding since founders experience minimal outside influence on their hiring decisions in the early years, whereas later decisions may be affected by the preferences of outside investors and important stakeholders (Wasserman 2017). In investigating founders' hiring choices, we follow the tradition of the team-composition literature and examine whether founders are more likely to hire managers who are similar to them or those who are dissimilar and possess complementary human and social capital.

Superior characteristics

Prior work on self-employed individuals and founding teams suggests that certain entrepreneurs' characteristics are positively associated with firm performance. These characteristics include male gender, mature age, longer years of education, and relevant industry, regional, managerial, and entrepreneurial experiences (Campbell 2013; Cooper, Gimeno-Gascon, and Woo 1994; Dahl and Sorenson 2012; Delmar and Shane 2006; Dencker and Gruber 2015; Honore and Ganco, 2016; Shane and Stuart 2002).

In line with these studies, we refer to *male gender*, *prior relevant experiences*, and *high values of age and education* as ***superior characteristics***, whereas *female gender*, *no relevant experience*, and *low values of age and education* are ***baseline characteristics***. Accordingly, we divide founders and hired managers into those who possess superior characteristics or ***superior founders/managers*** and those who do not possess superior characteristics or ***baseline founders/managers***. A founder/manager may have some baseline and some superior characteristics. For example, a founder with a master's degree but no experience in the relevant industry is a superior founder in education but has baseline industry experience. Similarly, a female manager with prior managerial experience is presumably a superior manager in managerial experience, but has baseline gender. In line with the prior studies, we treat each characteristic individually rather than combining them in a bundle (Ruef et al. 2003). Some of the manager's characteristics, such as experience, may be more relevant for firm performance, and some, such as gender or age, may more important for the founder's personal comfort. Therefore, we would like to assess whether founders use distinct criteria for different characteristics when they choose their managers.

We use an identical set of characteristics for founders and hired managers. While entrepreneurship literature has typically focused on the characteristics of founder-managers, it is reasonable to expect that human and social capital that is beneficial for a founder-manager should also be beneficial for a hired manager. Indeed, longer education helps develop cognitive abilities and commitment to problem solving (Cooper et al. 1994). Prior industry, regional, managerial, and entrepreneurial experiences help managers learn necessary skills and build relevant social capital (Campbell 2013; Dencker and Gruber 2015; Shane and Stuart 2002). Higher education and some other superior characteristics have also been positively correlated with firm performance for managers of established organizations and family firms (e.g., Bennedsen et al. 2007; Chang and Shim 2015; Dahl and Sorenson 2012). As such, we expect that managers of new businesses may be superior on the same characteristics as the founders, i.e., gender, age, relevant prior experience, and education. The net benefits of hiring a manager with superior characteristics are presented in Equation 1:

$$\pi_{\text{sup}\_man} = X_{\text{sup}\_man} - Z_{\text{base}\_man} \,, \qquad (1)$$

where π is the performance benefit of hiring a manager with the superior characteristic relative to hiring a manager who lacks it; X_{sup_man} is the net benefit of hiring a manager with the superior characteristic (value minus cost); and Z_{base_man} is the net benefit of hiring a manager without such a superior characteristic (a manager with the baseline characteristic).

In order to build our theoretical argument, we start with assuming that founders with superior and baseline characteristics benefit equally from adding a superior manager. Thus, firm-performance implications of hiring a manager with the superior characteristic relative to a manager with the baseline characteristic are the same, i.e., $\pi_{\text{sup}\_man|_{\text{sup}\_founder}} = \pi_{\text{sup}\_man|_{\text{base}\_founder}}$, where *sup_founder* and *base_founder* stand for founders with a superior and baseline characteristics respectively. For example, in the case of gender, $\pi_{\text{male}\_man|_{\text{male}\_founder}} = \pi_{\text{male}\_man|_{\text{female}\_founder}} = X_{\text{male}\_man} - Z_{\text{female}\_man}$.

If entrepreneurs are profit-maximizing and all founders are equally likely to find managers with the superior characteristics if they wish to do so, then all founders will tend to hire managers with the superior characteristics as long as such managers are available in the labor force. For example, if male gender is a superior characteristic, then both female and male founders will be equally likely to hire male managers. Therefore, we expect that, for each of the superior characteristics listed above, we will observe that

H1: A founder with the superior characteristic and a founder with the corresponding baseline characteristic will be equally likely to hire a manager with the superior characteristic.

Diversity

Prior research suggests that firms may also benefit from diverse founding teams. New founders often lack important resources and networks (Hellmann 2007; Shane and Stuart 2002) and managers with different demographic characteristics, education, and experiences may help by expanding the breadth of firm resources. They also likely have different networks and expand the firm's social capital. Furthermore, the variation in education and experience may enhance a firm's capabilities, broaden the team's knowledge, and lead to innovation and creative problem solving (Randel and Jaussi 2003). Indeed, several prior studies have demonstrated a positive effect of diversity on venture outcomes. Steffens et al. (2012) found positive relationships between long-term firm performance and the founding team diversity in age, gender, and start-up experience. Similarly, Hoogendoorn et al. (2013) demonstrate that business teams with equal gender mix perform better than teams dominated by one gender. Eesley et al. (2014) show that functionally diverse founding teams tend to exhibit better performance, and Beckman and Burton (2008) determine that broadly experienced teams are more likely to receive venture capital than teams with narrow experience. Given such evidence, it is reasonable to expect that firms will benefit when founders hire managers who are different from them.

Once we add the impact of diversity, the firm-performance implications of hiring a manager with the superior characteristic become

$$\pi_{\text{sup}\_man} = X_{\text{sup}\_man} - Z_{\text{base}\_man} + D_{\text{sup}\_man}, \qquad (2)$$

where D_{sup_man} is the net effect of diversity, which could be positive or negative depending on the founder and manager combination.

When a founder with a superior characteristic hires a manager with the corresponding superior characteristic, the founder does not get any benefits of a diverse team, which he would otherwise gain by hiring a manager with the baseline characteristic. In fact, such a founder is losing potential profit that would have come with hiring a baseline manager. However, a manager with a superior characteristic brings diversity benefits to a founder with the corresponding baseline characteristic. Therefore, when hiring a manager with a superior characteristic, the net effect of diversity becomes negative for founders with the corresponding superior characteristic ($D_{\text{sup}\_\text{man}|_{\text{sup}\_founder}} < 0$) and positive for founders with the baseline characteristic ($D_{\text{sup}\_\text{man}|_{base\_founder}} > 0$). We assume that the benefits of diversity are expected to be the same for the following pairs: "superior founder and baseline manager" and "baseline founder and superior manager." As a result, $\pi_{\text{sup}\_man|_{\text{sup}\_founder}} < \pi_{\text{sup}\_man|_{\text{base}\_founder}}$: a founder with the baseline characteristic will experience greater benefits from hiring a manager with the superior characteristic than a founder with the superior characteristic. Therefore, we expect that

H2: A founder with the superior characteristic will be less likely to hire a manager with the superior characteristic than a founder with the corresponding baseline characteristic.

This would imply, for example, that male founders will be less likely to hire male managers than female founders.

Similarity

Conversely, the literature also provides several reasons why founders may tend to hire managers who are similar to them. Below, we review these reasons in greater detail and refer to them as the *benefits of similarity*, *homophily*, and *network constraints*.

Benefits of similarity: Some studies argue that it is not diversity but similarity of team members that provides extra benefits to the start-up. People with similar characteristics and backgrounds may work more effectively together since they are more likely to come to a consensus in decision making and spend less time and effort arguing with each other (Knight et al. 1999; Brown and Eisenhardt 1997). Founding teams with similar experiences have common knowledge, process information in similar ways, and are more efficient at identifying and solving problems (e.g., Knight et al. 1999; Wezel, Cattani, and Pennings 2006; Zheng, Devaughn, and Zellmer-Bruhn 2016). Schjoedt et al. (2013), for example, argue that the effectiveness of a founding team is more likely to be determined by the good relationships between team members than the diversity of their skills. Sarada and Tocoian (2015) demonstrate that teams that consist of prior coworkers have better compatibility, more efficient resource sharing, and higher chances of venture survival.

If homogeneous founder-manager pairs bring value to the firm, then we anticipate that

$$\pi_{\mathrm{sup}\_man} = X_{\mathrm{sup}\_man} - Z_{\mathrm{base}\_man} + S_{\mathrm{sup}\_man}, \qquad (3)$$

where S_{sup_man} is a net similarity effect, which again can be positive or negative depending on the combination of founders and managers.

When hiring a manager with a superior characteristic, the net effect of similarity is positive for founders with the corresponding superior characteristic ($S_{\mathrm{sup}\_man|_{sup\_founder}} > 0$) and negative for founders with the baseline characteristic ($S_{\mathrm{sup}\_man|_{base\_founder}} < 0$). Similar to diversity, we assume that the benefits of similarity are the same for the "superior founder and superior manager" and "baseline founder and baseline manager" pairs. This means that a founder with the superior characteristic will gain greater benefits from hiring a manager with the corresponding superior characteristic than a founder who lacks such a superior trait: $\pi_{\mathrm{sup}\_man|_{\mathrm{sup}\_founder}} > \pi_{\mathrm{sup}\_man|_{\mathrm{base}\_founder}}$.

Homophily: Up until now, we assumed that entrepreneurs maximize firm profit when selecting a hired manager. However, founders may sometimes deviate from profit maximization. For example, they may take into consideration their personal non-pecuniary benefits from hiring certain managers. Prior work suggests that personal non-pecuniary motives play an important role in entrepreneurs' strategic decisions regarding their firms, such as firm founding, attracting external investment, location choice, production strategy, and management choice (e.g., Dahl and Sorenson 2010; Gomez-Mejia et al. 2007; Wasserman 2017). When selecting a manager, founders may also aim to maximize their overall utility, which includes personal non-pecuniary benefits rather than just start-up profit.

Prior studies imply that higher non-pecuniary benefits may be achieved from working with similar, as opposed to different, managers. Thus, individuals are known to be more comfortable working with people with whom they share similar demographic characteristics and backgrounds. Similar individuals feel greater mutual attraction, trust, and understanding (e.g., McPherson, Smith-Lovin, and Cook 2001; Ruef et al. 2003; Aldrich and Kim 2007). Since entrepreneurs put high value on non-pecuniary aspects of self-employment (e.g., Hamilton 2000), they will likely value a comfortable work environment, which is easier to achieve when working with similar employees. Ruef et al. (2003) and Hart (2014), for example, demonstrate that homophily by gender, ethnicity, and prior occupation is a strong driving force in new-venture team formation. The fact that founders and managers derive non-pecuniary benefits from working with similar people may lead to hiring similar managers even when such managers have no positive impact on firm performance. If non-pecuniary benefits of similarity are high enough, founders with superior characteristics will be more likely to hire managers with similarly superior characteristics than founders with baseline characteristics even when $\pi_{\sup\_man|_{\sup\_founder}} \leq \pi_{\sup\_man|_{\text{base}\_founder}}$.

Network constraints and selection: Another potential reason why entrepreneurs may fail to hire those managers who would maximize firm performance might be that they are unable to find and attract the right managers. So far, in order to build our argument, we assumed that founders with superior and baseline characteristics are equally likely to hire managers with preferred characteristics if they choose to do so.[2] However, founders may have different choice sets, which are determined by their networks. In hiring, entrepreneurs often rely on their personal connections and hire people from close or distant social circles (Schjoedt et al. 2013; Ruef et al. 2003). Personal connections are particularly important for young firms, since start-ups have no established status and the personal reputation of the founder serves as a guarantee for early employees (Uzzi 1996). Thus, in their search for managers, entrepreneurs may find it difficult to identify and engage the right people outside of their network (Dahl and Sorenson 2012; Hart 2014; Ruef et al. 2003). Since social and professional networks typically consist of similar individuals, such as former classmates sharing the same education and age, coworkers with the same industry experience, and people of similar gender, the choice set of managers may be limited to people who are similar to them and may contain few potential hires with dissimilar human capital (Hart 2014).

Potential employees may also sort into working for particular founders. Honore and Ganco (2016), for example, argue that individuals may have a strong preference for working with founders with superior characteristics since such characteristics signal higher firm quality and presumably better prospects for employees. Therefore, founders with baseline characteristics may have a limited choice of potential employees, which would include few candidates with superior characteristics. Such founders may be willing to hire managers with superior attributes but be unable to find and engage such individuals. Due to the founders' choice set constraint, we may observe that entrepreneurs deviate from the profit-maximizing manager choice. Thus, baseline founders will be limited to hiring baseline managers and empirically we will observe that founders with superior characteristics are more likely to hire managers with similar superior characteristics than founders with baseline characteristics even when $\pi_{\sup\_man|_{\sup\_founder}} \leq \pi_{\sup\_man|_{\text{base}\_founder}}$.

Taken together, the three mechanisms discussed above—the benefits of similarity, homophily, and network constraints and selection—imply that due to performance-related reasons, personal

[2] In the Additional Analysis and Robustness Checks section, we further discuss this assumption.

preferences, or constrained pool of potential hires, founders will tend to hire managers who are similar to them.

H3: A founder with a superior characteristic will be more likely to hire a manager with that superior characteristic than a founder with the corresponding baseline characteristic.

Based on this hypothesis, we would expect, for example, that male founders will be more likely to hire male managers than female founders.

We summarize our theoretical predictions in Figure 1. We anticipate that founders may rely on different mechanisms for different types of human capital. Founders may rely on homophily when deciding on a manager's nationality and prefer a manager with non-similar background when assessing manager's prior industry experience. The literature, however, does not provide conclusive indication as to which logic applies to which manager's characteristics. Therefore, it becomes an empirical exercise to determine which mechanism explains founder choice regarding each individual manager's demographic characteristics and relevant experience. In doing so, in line with prior studies (e.g., Ruef et al. 2003), we focus on each ascriptive and achieved characteristic individually rather than aggregating them into a single similarity measure.

Data

We use a Portuguese longitudinal database, Quadros de Pessoal (QP), which has been intensively used in academic research (e.g., Geroski, Mata, and Portugal 2010). The data are based upon a mandatory survey and covers the entire Portuguese private sector from 1986 until 2012. The database has detailed information at the individual and firm level and allows us to match individuals to the firms that they have founded or worked for. For each firm, the following data are available: year of founding, location, size (number of employees), industry, and sales. For each individual, the database contains information on gender, age, date of hire, education, and occupation. With these data, we are able to examine new ventures from their inception and identify their founders and top managers. As individuals are cross-referenced by a unique identifier, the database makes it possible to track their labor-market histories since 1986.

From QP, we select all new ventures established between 1991 and 2009 with at least one hired employee who is not a founder. We exclude non-profit start-ups and ventures established in the agriculture and fishing sectors. Next, for each start-up, we identify its founders and their career histories. We exclude start-ups where we could not identify business owners. To eliminate individuals with limited career histories and with different motivations to establish a start-up, we restrict the sample to sole business owners with age between 20 and 60 at the time of firm founding. We also exclude individuals who simultaneously own more than one firm and part-time entrepreneurs. Then we evaluate whether the founder hired a top manager in the first two years of the start-up. We focus on the first two years after founding since finding the right manager may take time. Indeed, we observe that the majority of founders who hire CEOs do so in the first few years after founding. A top manager (CEO) is defined as a director or chief executive officer of a large or medium venture and a general manager of a small venture (in Portugal, this group identifies individuals who manage small enterprises). In order to be able to precisely compare characteristics of founders and top managers, we limit our sample to firms with a single founder and a single top manager. Similarly to business owners, we restrict our sample to firms with top managers whose age is between 20 and 60 at the time of firm founding. We evaluate top managers' work history by focusing on the 5 years prior to joining the firm. We exclude firms that are managed by the founders themselves (54,209 firms, or 91.5% of the sample).

Our final sample consists of 5,043 start-ups with hired top managers, which constitute 8.5 percent of all new ventures founded by a single founder. Among those 5,043 ventures, 33 percent operate in retail and wholesale trade, 26 percent in services, 16 percent in construction, 13 percent in restaurants and hotels, and 12 percent in manufacturing. Firms are largely concentrated in the North Region of Portugal (39%), Lisbon (24%), and Center (21%). These geographic and industry distributions are nearly identical to the distributions of founder-managed start-ups.

Key Variables

We focus on eight key ascriptive and achieved individual's characteristics that have been correlated with firm performance in prior entrepreneurship studies, i.e., gender, age, education, foreign origin, and entrepreneurial, managerial, regional, and industry experiences (e.g., Campbell 2013; Cooper et al. 1994; Dahl and Sorenson 2012; Delmar and Shane 2006; Dencker and Gruber 2015; Honore and Ganco 2016; Shane and Stuart 2002). Prior work has focused on founders who manage their firms personally and observed that male gender, higher education, native origin, and the presence of relevant industry, managerial, and regional experiences are positively associated with start-up performance. The findings for age and entrepreneurial experience were somewhat mixed, with some studies finding a positive correlation but others finding no significant relations to performance or non-linear effects. We include the latter variables in our analysis, but treat our findings regarding these variables with caution and discuss them in greater detail in the subsequent sections of the paper. Appendix 1 presents a summary of the variable definitions and we also discuss each of those variables in detail below.

To ensure that our setting is similar to the data used in other entrepreneurship studies, in the preliminary analysis, we have tested the above variables in a sample of 54,209 founder-managed Portuguese firms (see Appendix 2). Consistently with prior studies, we find that education, managerial experience, and industry experience are positively correlated with firm performance. For age, our findings are in line with the studies that suggest that firms started by younger entrepreneurs perform better. The findings for entrepreneurial experience and regional experience are somewhat mixed. Entrepreneurial experience has no significant effect and regional experience is negatively correlated with firm productivity. This may be due to the fact that individuals with prior entrepreneurial and regional experience have higher non-pecuniary benefits from entrepreneurship (e.g., Dahl and Sorenson 2012) and are willing to accept lower firm performance. Below, we further discuss each of the above characteristics and our measures for them.

Gender: In prior studies, male entrepreneurs have been found to have better firm performance than female founders. It has been proposed that women entrepreneurs may have lower performance for the following reasons: First, they may have less human capital and may be underappreciated in the labor market, which lowers their opportunity cost of self-employment (Cooper et al. 1994). Second, they may have smaller relevant social capital than men and may find it more difficult to assemble resources and get advice (Cooper et al. 1994). Moreover, women may place a higher value on non-financial aspects of self-employment and accept lower income (Clain 2000; Heilbrunn 2004). Finally, women may be burdened by responsibilities at home that limit the amount of time they spend at their firms (Hundley 2001). Similarly, these factors may also negatively influence the performance of female CEOs in start-ups, leading to male CEOs being superior to female managers in small businesses. We use a dummy variable ***male*** to capture founder's and manager's gender, which equals 1 for male individuals and 0 for female.

Foreign origin: Foreignness has been typically negatively associated with firm performance, since non-native individuals lack local knowledge, skills, and social networks (e.g., Zaheer and Mosakowski 1997). We capture foreignness with a dummy variable ***foreign***, which equals 1 when an individual was born outside of Portugal and 0 otherwise.

Age: In some studies, entrepreneur's age has been found to be positively associated with the venture outcome, whereas others demonstrated a negative effect or an inverted U-shaped relationship (e.g., Dahl and Sorenson 2012; Elfenbein, Hamilton, and Zenger 2010). We created four dummy variables that correspond to four age brackets: ***20–30***-year-olds, ***30–40***-year-olds, ***40–50***-year-olds, and ***50–60***-year olds (the last group may include individuals up to 62 years of age). The ages of both founder and manager are measured in the year when the manager is hired.

Education: A higher level of education is positively associated with the start-up performance since founders and managers with higher education have advanced knowledge and skills as well as higher level of critical thinking and commitment to problem solving (e.g., Cooper et al. 1994). We created four dummy variables corresponding to four levels of formal education. ***Very low education*** is a dummy variable that equals 1 for individuals who never completed elementary school and 0 otherwise; ***low***

education is a dummy variable that equals 1 for individuals who attended junior high school only and 0 otherwise; ***medium education*** equals 1 when an individual has a high-school diploma or vocational school degree and 0 otherwise; and ***high education*** equals 1 for individuals with bachelor, master's, or doctoral degrees and 0 otherwise. Founder's and manager's education levels are measured in the year when the manager is hired.

Industry experience: Experience in the target industry is expected to have a positive effect on firm performance. It provides relevant knowledge of technology, organization processes, business strategies, consumers, suppliers, rivals, and government regulations (e.g., Lazear 2005; Dencker and Gruber 2015). It also helps to build relevant social capital. Additionally, people are more likely to discover opportunities related to information that they already possess; therefore, individuals with industry experience may be better at identifying promising opportunities (Cooper et al. 1994; Dahl and Sorenson 2012; Dencker and Gruber 2015; Shane and Stuart 2002).

We record in which industries founders and managers worked in the five years prior to founding or joining the firm. We match these industries with the firm industry on the four-digit level. ***Industry experience*** is a dummy variable that equals 1 when an individual has worked in the stat-up's industry for at least a year in the five-year period before founding (for founders) or joining the firm (for managers) and 0 otherwise.

Henceforth, we measure relevant experience in the last five years before firm founding (for founders) or before joining the firm (for managers). We focus on the past five years since it has been found that the relevance and skills obtained through such experience significantly diminishes with time (e.g., Fern et al. 2012). Our window of observation is similar to the ones used in prior entrepreneurship studies (e.g., Dahl and Sorenson 2012; Sorensen 2007).

Managerial experience: Similar to industry experience, managerial experience provides tacit knowledge about firm operation. Individuals with prior managerial experience understand how businesses function and are better at identifying and fulfilling the needs of the firm (e.g., Dencker and Gruber 2015; Lazear 2005). Thus, Dencker and Gruber (2015) demonstrate a positive association between founder's managerial experience and venture performance, and Muller and Murmann (2016) have found that founders with technical skills benefit from hiring employees with management skills. In our analysis, ***managerial experience*** is a dummy variable, which equals 1 when an individual has at least one year of top-management experience in the five years prior to the firm founding (for founders) or joining the firm (for managers) and 0 otherwise.

Entrepreneurial experience: Prior research provides mixed evidence for the impact of entrepreneurial experience on firm performance. On the one hand, prior founding experience may be good because it builds general human capital through exposure to different tasks and responsibilities.

Individuals learn how to staff and lead start-ups, and build relationships with investors, employees, suppliers, and consumers (Campbell 2013; Shane and Stuart 2002). On the other hand, individuals with prior self-employment experience may have broadened their skills too far and become “hobos” instead of “jacks-of-all-trades” (Astebro and Thompson 2011). As a result, their start-ups may have lower-quality products relative to the firms founded by individuals with more in-depth experience (e.g., Roberts, Negro, and Swaminathan 2013). Moreover, managers with prior founding experience might have failed their previous start-ups and may have lower expertise. Researchers have found mixed empirical evidence for the effect of prior entrepreneurial experience on firm performance, with some studies demonstrating a positive effect, and other studies finding no impact or even a negative effect (e.g., Delmar and Shane 2006; Dencker and Gruber 2015; Shane and Stuart 2002). We capture prior founding experience by an ***entrepreneurial experience*** dummy variable, which equals 1 if an individual has any founding experience in the past 5 years before founding the firm (for founders) or joining the firm (for managers) and 0 otherwise.

Regional experience: The effect of the regional experience is also twofold. On the one hand, individuals with regional experience are familiar with the local business environment and have social networks that can provide superior resources and information (e.g., Dahl and Sorenson 2012). On the other hand, individuals may remain in the region in order to be close to family and friends (Dahl and Sorenson 2010). Entrepreneurs and small business managers may stick to start-ups because they have no other job options in the region but they do not want to move. They may also have lower performance threshold for closing their business. ***Regional experience*** is a dummy variable that equals 1 when an individual has lived in the municipality of firm location at least a year in the five-year period prior to founding (for founders) or joining the firm (for managers) and 0 otherwise.

Parent firm: We also consider whether a founder and a manager come from the same parent firm. Our ***same parent firm*** dummy variable equals 1 if the founder and the manager have their most recent employment (before founding or joining the firm) in the same organization.

Control variables: Since the choice of manager may also depend on the type of the start-up, where appropriate, our models control for the ***firm size***, measured as a natural logarithm of the firm employment, and dummy variables for the firm’s two-digit ***industry***[3], ***region*** of location (North, Algarve, Center, Lisbon, Alentejo, Acores, or Madeira) and ***founding year***.

Descriptive Statistics

Appendices 3 and 4 report summary statistics for the key variables. For comparison, both appendices provide descriptive data for both types of start-ups, firms with founder-managers and firms with hired

[3] Using four-digit industry controls does not change the findings.

managers. For firms with hired managers, Table 1 compares key characteristics of founders and their hired managers. Managers are slightly more likely to be female and are slightly more educated and experienced than founders. Founders, however, have higher wages at their most recent employment before the start-up.

Table 2 further elaborates on the similarities and differences between founders and managers. Overall, founders seem to have a tendency toward hiring managers who are similar to them. However, there is some notable heterogeneity in preferences among founders. For example, tendency for gender homogeneity is observed only for male founders. Female founders are much more likely to hire male than female CEOs. This observation is more consistent with our Hypothesis 2 than other theoretical mechanisms. Very young and senior founders also seem a little less likely to hire managers within their age brackets compared to founders who are 30 to 49 years old. This, however, may be explained by low availability of young and senior manager-candidates in the labor force. A similar situation is observed with the foreignness. While founders born abroad have a high tendency to hire foreign managers, they may be somewhat constrained in their choice by the availability of co-national managers. The limited number of potential candidates may also constrain those founders who would like to hire managers with prior entrepreneurial and managerial experience. Yet, even given such constraints, experienced founders seem to be more likely to hire experienced managers relative to inexperienced founders. Also interestingly, only 30 percent of founders find managers among their former coworkers. Consistent with prior findings, a founder is more likely to engage a former colleague to be a manager when a founder comes from a small rather than medium or large parent firm. However, the impact of the parent-firm characteristics disappears once we control for the characteristics of the founder and the manager (results are available on request). Overall, except for gender, our observations seem to be more in line with Hypothesis 3 than other hypotheses. Founders with characteristics that are considered superior are more likely to hire managers with similarly superior characteristics than founders with baseline attributes.

Empirical Analysis

Founders' hiring choices

As a next step, we run more formal tests of our theoretical predictions. Similar to prior studies (e.g., Honore and Ganco 2016), we consider all managers that were hired by our founders to constitute a risk set and examine how these managers are distributed among founders with superior and baseline characteristics. We are interested in determining whether founders with superior (baseline) characteristics are more or less likely to hire managers with similarly superior (baseline) human capital. In doing so, we use a cross-sectional sample of firms. Each firm has one founder and one CEO. We estimate a separate model for each individual characteristic, i.e., gender, four age groups, four education groups, nationality, and four types of experience.

$$Pr(X_{mk} = 1) = \beta_0 + \beta_1 F_{fk} + \beta_p F_{fp} + \beta_p M_{mp} + \ln(firm\ size)_i + I_i + R_r + Y_t + \varepsilon_i, \quad (4)$$

where *m* denotes a manager, k is a focal characteristic, p are all other characteristics, *f* is a founder, *i* is the firm, *r* is the region where the firm is located, and *t* is the year when the firm is founded.

The dependent variable in this equation, X_{mk}, captures manager's focal characteristic of interest. X_{mk} is a dummy variable that equals one when the manager has the characteristic and 0 otherwise. For example, in the gender regression, X_{mk} equals 1 when the manager is male and 0 when the manager is female. F_{fk} is a dummy variable for the founder's focal characteristic, which equals 1 when the founder has this characteristic and 0 otherwise. Again, in the gender regression, for example, F_{fk} equals 1 when the founder is male and 0 if the founder is female. X_{mk} and F_{fk} include the following variables (one in each model): male; age *20-30*, *30-40*, *40-50*, and *50-60*; *very low*, *low*, *medium*, and *high* education;[4] *foreign*; *entrepreneurial experience; managerial experience; industry experience*; and *regional experience*. M_{mp} and F_{fp} are vectors comprising all other manager's and founder's characteristics that are not used as the focal characteristic *k* in the current model. $Ln(firm\ size)_i$ is a measure of firm employment in the year of founding; I_i, R_r and Y_t are industry, region of location and founding-year dummies respectively; and ε_i is an error term. Standard errors are robust. We estimate a separate Probit model for each X_{mk} variable listed above.

As demonstrated in Table 3 and summarized by Figure 2, we find a strong tendency toward similarity between founders and their hired managers on all observed characteristics except gender. Founders with a superior characteristic are more likely to hire managers with a corresponding superior characteristic than founders with the baseline characteristic. Founders seem to be much more likely to hire managers who are similar to them in age, education, nationality, and experience. Such a tendency seems to be not only statistically but also economically significant. For example, foreign founders are 58 percentage points more likely to hire foreign managers than Portuguese founders. Founders with managerial experience are 7 percentage points more likely to hire managers with managerial experience than founders who lack such experience themselves. Similarly, founders with entrepreneurial, industry, and regional experiences are more likely to hire managers with similar levels of experience (by 5, 21, and 18 percentage points respectively) compared to founders who lack such experiences. Pairs of founders and managers also demonstrate significant similarity in age and education (see Appendix 5 for the marginal effects). Gender is a one notable exception: Male founders are 4 percentage points *less* likely to

[4] Using wider brackets for age (*20-40*, and *40-60*) and education (*very low* and *low* versus *medium and high*) does not change our findings.

hire male managers than female founders. Overall, the results for gender are consistent with Hypothesis 2, whereas the findings for all the other characteristics are in line with Hypothesis 3.

Performance implications

Our findings in Table 3 are consistent with the idea that for the majority of examined individual characteristics, except gender, founders have a tendency to hire managers who are similar to the founders themselves. In the theory section, we identified three mechanisms that may be responsible for the similarity in founder-manager pairs: similarity improves coordination and benefits firm performance (*benefits of similarity*); founders experience non-pecuniary benefits from working with similar managers (*homophily*); founders have restricted choice of managers, limited by their networks and managers' self-selection (*network constraints and selection*).

In this section, we further probe into these three mechanisms by examining how a manager's characteristics are associated with firm performance, since the above mechanisms have distinct performance implications. In particular, if founders choose their managers based on homophily or due to network constraints and selection, their choices are less likely to be aligned with profit maximization than when the founders are driven by the performance-benefits of similarity. Thus, by analyzing whether founders' hiring choices are aligned with firm performance, we expect to further distinguish between the mechanisms that drive the similarity of characteristics in founder-manager pairs.

In line with the prior studies that used firm productivity as an indicator of success (e.g., Campbell et al., 2012; Hamilton, Nickerson, and Owan 2012), we measure firm performance as a natural logarithm of the ratio of sales to the number of firm employees, ***ln(sales/employees)***. To examine how the association of the manager's characteristics and firm performance varies for different founders, we use an interaction between the manager's and founder's characteristics. We estimate a separate performance model for each of the eight focal manager's characteristics using Equation 5.

$$Ln(\frac{sales}{employees})_{it} = \beta_0 + \beta_1 F_{fk} + \beta_2 X_{mk} + \beta_3 F_{fk} \times X_{mk} + \beta_p F_{fp} + \beta_p M_{mp} + \ln(firm\ age)_{it} + I_i + R_r + Y_t + \varepsilon_{it}\ , \qquad (5)$$

The models are estimated in a panel firm-year dataset, where each firm is observed until it dies or until the end of our observation window, whichever comes first.[5] Standard errors are robust, clustered on firm. Since interpreting comparisons from four dummy variables is not trivial, for the performance

[5] Manager replacement in young firms is quite unlikely. Only 17 percent of firms in our sample changed managers during our observation period (up to 2012). To be conservative, we drop a firm from our panel dataset after it replaces its original manager. Manager replacements, however, are an interesting phenomenon by themselves. Understanding when founders replace managers and how they select subsequent managers will help further understand founders' hiring behavior. Thus, manager replacement in small businesses might be a fruitful area for future studies.

analysis, we divide our founders and managers into two respective groups for age and education: ***age 20–40*** and ***age 40–60***; ***low education***, which includes *low* and *very low* groups, and ***medium and high education***.

In the preliminary analysis (see Appendix 6), we examine average associations between firm performance and the characteristics of founders and managers across all firms with hired managers. Overall, the relationships are very similar to the ones observed for founder-managed firms (see Appendix 2), albeit with some coefficients no longer significant for firms with hired managers, potentially due to the smaller sample size relative to the sample of founder-managed firms. In general, the coefficients for the respective founders' and managers' characteristics are largely in the same direction and similar in magnitude to the ones from the sample of founder-managed firms. We observe that, on average, ventures do better when founders and managers are male, are better educated, and have prior managerial experience (particularly for managers), whereas prior regional experience has a negative association with firm productivity. Portuguese origin is positively correlated with firm success in Models 1 and 2, but the coefficient loses statistics significance when we simultaneously account for the founder's and manager's characteristics in Model 3.

As a next step, we examine how the associations between manager's characteristics and firm performance vary for different types of founders. Figure 1 summarizes our expectations for each of our hypotheses as well as under the three mechanisms underlying Hypothesis 3 (*benefits of similarity*, *homophily*, and *network constraints and selection*). Table 4 and Figure 3 demonstrate the associations between a manager's characteristics and firm performance for founders with superior and baseline characteristics. Below, we discuss these relationships for each manager characteristic individually.

Gender: Male managers are positively associated with firm performance in both female-founded and male-founded firms. However, the magnitude of this association is twice as large for female founders as for male founders.[6] These findings are consistent with Hypothesis 2. Given that female founders are also more likely to hire male managers than male founders, our performance results imply that founder's choice between male and female managers is positively aligned with firm performance. Further analysis suggests that hiring a male manager allows female founders to close the performance gap that female entrepreneurs have relative to male entrepreneurs (results are available from the authors on request).

Age: We find that for more senior founders (40–60 years old), manager's age has a negative association with firm performance. Given that senior founders tend to hire senior managers and junior founders have a preference for younger managers, the choice of manager seems misaligned with firm productivity for founders from the 40–60 age group.

[6] For female founders, hiring a male manager is associated with a 0.188 increase in firm productivity relative to a female manager, but for male founders, such an association is only 0.057.

Education: Managers with higher education seem to equally benefit all founders. However, our earlier results suggest that founders prefer managers with similar education, which means that entrepreneurs with low education have a stronger preference for managers with low education: more than 50 percent of entrepreneurs with low and very low education hire managers with similar education levels. This implies that the choice of manager's education may be misaligned with firm performance for a significant share of low-educated entrepreneurs.

Foreign/Portuguese origin: We find that, regardless of the founder's origin, managers born in Portugal have start-ups with better performance than managers born outside of the country. Yet founders of foreign origin seem to prefer foreign managers, which suggests that their choice of manager may be misaligned with firm success.

Managerial experience: Managers with prior top-management experience seem to equally benefit all founders. This implies that founders with and without top-management experience should be equally likely to hire experienced managers. We have observed, however, that founders without top-management experience tend to hire managers without such experience, which points to their choice being potentially inconsistent with what is best for their firms.

Homophily vs. network constraints and selection: Overall, our findings for age, education, foreign/Portuguese origin, and managerial experience seem inconsistent with the first mechanism underlying Hypothesis 3. It is unlikely that the tendency to hire managers who are similar to the founders in age, education, origin, and managerial experience is driven by the similarity benefits to the firm. It is more plausible that such a tendency is explained by homophily or constrained networks and choice sets of founders with baseline characteristics. To further distinguish between the *homophily* and *constrained networks and selection* mechanisms, we examine whether founders are even more likely to hire similar managers when they have smaller networks. Since start-ups rarely have an established brand name and reputation, their founders rely heavily on personal networks in hiring their first employees. Broader networks typically contain more diverse individuals than narrow networks. Moreover, founders with baseline characteristics may find it easier to attract managers with superior characteristics using their personal ties as opposed to the general job market. First, superior managers may be less distracted by the founders' lack of superior traits if managers know these founders personally and can judge them on the traits not observable to outsiders. Second, potential managers may have personal obligations to founders as a result of prior interactions and may be more willing to accept a job in their start-ups to fulfill those obligations. Small personal networks are less likely to include many diverse individuals and provide fewer potential managers with personal obligations, thereby narrowing founders' choice sets.

We expect that entrepreneurs who establish firms in regions where they have had no personal experience in the past five years have fewer personal connections in those regions. It is unlikely that managers come from outside of the firm-location region since relocation is costly and start-ups rarely provide a lucrative and stable employment in the first few years of operation. If narrow local networks constrain the choice set of potential managers by limiting it to more similar individuals, then founders should be even more constrained in unfamiliar regions and should be even more likely to hire managers who are similar to them. We examine this proposition empirically; however, our supplementary analysis (available on request) does not support such expectations. Founders who lack regional experience are no more likely to hire similar managers than founders who have such experience. Therefore, we conclude that founders' tendency to hire managers who are similar to the founders on age, education, country origin, and managerial background is more consistent with the *homophily* than the *network constraints and selection* explanation. This is in line with the prior work by Ruef et al. (2003), who found that the similarity in founding teams is more likely to be driven by homophily and availability of particular individuals in the labor market than by founders' network constraints.

Industry experience: We find that managers with industry experience have better firm performance in firms with experienced founders. However, in startups with inexperienced founders, the manager's industry experience has no positive correlation with performance. Given that founders prefer to hire managers with the same level of experience as theirs, their choice seems aligned with firm performance. Therefore, the founder's choice of the manager's level of industry experience seems to be in line with the first mechanism, underlying Hypothesis 3, the *benefits of similarity*.

Entrepreneurial experience: We did not find any significant association between manager's prior founding experience and firm performance. These results are consistent with our observations for founder-managed firms in Portugal, where we also did not find any significant correlation between founder's prior entrepreneurial experience and start-up productivity. Our results are also largely in line with prior studies that have demonstrated mixed evidence for the impact of prior founding experience of self-employed individuals on firm performance (e.g., Delmar and Shane 2006; Dencker and Gruber 2015; Shane and Stuart 2002). Those studies argue that while prior founding experience helps individuals build general human capital, it may be less valuable if it comes from failed start-ups (Campbell 2013). Perhaps the majority of managers with prior founding experience had such experience in failed, rather than successful, firms. They may also have a strong preference for non-pecuniary benefits of control, which may attracts them to start-ups even when they are not particularly good at operating them.

Regional experience: A similar situation is observed regarding the regional experience, with the exception that manager's regional experience seems more negative in firms where founders also have experience in the firm's municipality of location (albeit only at a 10% significance level). It has been shown that individuals with longer region tenure may prefer to stay in that region for non-financial reasons (Dahl and Sorenson 2010). They may become small-business managers not because they are good at it but because this is their only local employment option. Dahl and Sorenson (2012) argue that local entrepreneurs may compensate for the negative effect of their non-pecuniary motives by using their local networks for resources and advice. Hired managers may, however, be reluctant to activate their personal connections on behalf of someone else's firm. Regional experience is, nevertheless, less detrimental when an experienced manager is paired with an inexperienced founder. This suggests that a manager's local experience, such as local knowledge and connections, becomes redundant when a founder also has it. Thus, in case of entrepreneurial and regional experience, the presence of such experiences may not be superior. Since founders still tend to hire managers with similar experience, it is the founders with prior founding and regional experience who are more likely to experience a negative impact of their choices. As for the prevalence of such choice, among entrepreneurs with prior founding experience, only one fourth hire similar managers, perhaps due to the small number of such managers in the labor force. On the contrast, many more founders with regional experience (84%) hire similar managers, so for them the negative effect of the manager's prior regional experience may be more widespread.

Parent firm: We would also like to note that we did not find any significant difference in the performance of firms where founders and managers come from the same versus different parent-organizations (results are available on request).

Summary of the findings

Overall, our findings are in line with the idea that, except for gender, founders have a tendency to hire managers who are similar to them, even when such choice may lead to lower firm performance. Only for the industry experience does similarity seem to benefit firm performance and the choice of manager is likely aligned with performance maximization. For other manager characteristics, the similarity in founder-manager pairs seems to be driven by homophily, or entrepreneurs' psychological preference for similar managers. For some founders, often the ones with superior characteristics, their non-pecuniary motivation for working with similar others may coincidentally be associated with better firm performance. However, for many founders it is not. We also found no positive association between firm performance and two managers' characteristics that some prior studies believed to be superior in self-employed individuals, such as entrepreneurial experience and regional experience. Our findings are, for example, consistent with the idea that founders with regional experience may be worse off hiring managers who are similar to them.

We should note, however, that our performance results are not causal. In order to come close to establishing causality, we control for a battery of managers', founders', and firms' characteristics that may be simultaneously correlated with the founder's choice and firm performance. Yet there may be some other factors, unobserved by us, that may introduce an omitted variable bias. So, whereas our results are largely consistent with the homophily story, we encourage further investigation of the causality of the established associations in future research.

Additional Analysis and Robustness Checks

In further analysis (summarized below; results available from the authors on request), we examine whether our findings may vary across different groups of firms and founders. One may wonder, for example, if founders of start-ups that require more advanced expertise may be less driven by homophily in their search for top managers. To examine this, we split our sample into knowledge-based firms and all other ventures.[7] Overall, hiring strategies of founders are similar in knowledge-based and other firms. A few exceptions are gender, education, and managerial experience. Relative to other firms, in knowledge-based firms male founders are slightly more likely to hire male managers, founders with high education are more likely to hire managers with high education, whereas founders with managerial experience are less likely to hire managers with similar experience. The final observation is perhaps due to the fact that knowledge-based firms require both managerial and technology-specific knowledge for success and founders with prior managerial experience may aim to complement their own managerial experience with the technology-specific experience of a hired manager.

We also examined whether the choice of manager was different among founders who were more actively engaged in managing their firms versus other founders. We compared ventures where founders chose to serve on the management team with ventures where founders did not hold any formal management positions. Founders who served on the management team were less likely to hire similar CEOs than other founders. One potential explanation for that might be that similarity serves as a basis for greater trust between a founder and a manager. When founders co-manage their firms together with hired managers, they can better monitor and control hired managers' behavior. Therefore, psychological trust plays a less important role in hiring. Non-managing founders, however, are less able to verify and influence hired managers' behavior, and therefore, opt to hire someone who they intuitively trust more.

Moreover, we have noticed that when founders hire their managers, they use two types of contracts: permanent and temporary. Permanent contracts for top-management positions have a probation period of 240 days, but after that Portuguese labor laws make it very difficult to fire a permanent employee. Temporary contracts can be extended for up to two years and can be easily terminated. Since a permanent contract is riskier for a founder, the founders would give them to hired managers whom the founders are more likely to keep for longer time. If founders particularly care about psychological

[7] According to OECD (2002), knowledge-based industries include industries that are relatively intensive in their inputs of technology or human capital. These industries include high-technology manufacturing and service activities that are intensive users of technology or have highly skilled workforce, such as finance, insurance, and communication.

compatibility with their managers, we should observe that managers with permanent contracts are even more likely to be similar to founders than managers with temporary contracts. In our dataset, 46 percent of managers have permanent contracts and 54 percent have temporary or unclassified contracts. We observe that founders are more likely to give permanent contracts to similar managers, which is in line with our homophily expectation.[8] This is true for all characteristics except prior managerial and regional experiences. This observation also suggests that the similarity between founders and managers is less likely due to self-selection of better managers into better firms. If this were true, baseline founders would be more likely to use permanent contracts for superior managers in order to attract them with more lucrative employment terms. But this is contrary to what we observe.

Another thing that may shift founders' preference from homophily to profit maximization is prior entrepreneurial experience. Founders with prior start-up experience have better knowledge of what skills are required for running a successful start-up. They may also be more profit-oriented than other entrepreneurs. Consistent with this expectation, we observe that entrepreneurs with prior founding experience are less likely to hire similar managers on all characteristics, except regional experience.

One may also wonder if the founder's choice of a hired manager may be influenced by any other organizational stakeholders, such as major investors. By selecting ventures very early in their history we reduce the risk of venture capital funding, as in Portugal venture capital funding of such early start-ups is very rare.[9] We also explicitly controlled for the presence of debt on start-ups' initial capital structure. We assumed that the larger the share of debt in the initial capital structure of the start-up, the larger the external investors' stake in the firm and the more likely such investors to influence manager choice to make it better aligned with firm performance, even at the expense of the founder's psychological comfort. Empirically, however, we observed that founders of firms with greater and smaller shares of debt had very similar hiring patterns and chose managers on similar bases.

Furthermore, one may be curious if our observation that female founders are more likely to hire male managers than male founders can be explained by the fact that some entrepreneurs hire their spouses as managers. We consider this unlikely due to the following reasons. First, the majority of start-ups where couples are actively engaged in developing a venture appear in the entrepreneurship database as having two founders, a husband and a wife. Since we only include single-founder firms, such ventures are excluded from our analysis. Second, while the identity of founders' partners is not reported in our

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[8] When we narrowed our sample by excluding managers with unclassified contracts, the findings remained the same, with the exception of gender. The coefficient for gender was negative but not statistically significant.
[9] According to the Portuguese Association of Venture Capital between 1999 and 2006, 323 new start-ups received venture capital funding, corresponding to 0.2 percent of total start-ups. In the same period, the amount invested equaled 158 million euros.

database, we can identify firms where family members are hired at non-management positions. Such "family firms" are at a particular risk of having founders' spouses as managers. However, the tendency to hire managers of a different gender is the same in "family firms" as in all other firms in our sample, which suggests that our results are unlikely driven by hiring spouses as managers.

In our analysis, we assumed that hiring a manager was a two-step process, where the founder first decided to delegate firm operation to someone else and then selected a particular manager based on the potential managers' characteristics. Thus, all our findings are conditional on the decision to hire a manager and apply only to the founders who have made such a decision rather than to the general population of entrepreneurs. However, we also checked that this assumption did not introduce any significant bias in our results. In doing so, we used the entire population of entrepreneurs and the Heckman selection model, where in the first stage we modeled the decision to hire a manager and in the second stage we estimated the manager choice. Ideally, we would like to use an exogenous instrument for the decision to hire a manager in the first stage, but unfortunately such an instrument was not available to us. Instead, we estimated the first stage using demographic and experience variables that have been found to be significantly correlated with the decision to hire a manager in the prior work (e.g., Kulchina and Gjerløv-Juel 2017). The results of the Heckman selection models are not materially different from our main findings.

It might also be useful to note that in the theory section we assumed that both founders with superior characteristics and founders with baseline characteristics benefit equally from the managers' superior traits. One may wonder if such an assumption may be violated and the observed tendency to hire similar managers may be driven by the fact that superior founders are better at exploiting superior characteristics of their managers than baseline founders. This is, however, unlikely since we would then observe that managers with superior characteristics are associated with greater financial value when combined with superior founders, which largely contradicts our findings in Table 4 and Figure 3.[10]

One might also wonder if founders tend to hire similar managers because they perceive this as a less risky choice as they know better what to expect of those managers (Kahnemann and Tversky 1979). If this were true, such a tendency would be more pronounced in industries with higher volatility of returns. In those industries, it is even harder to attribute changes in firm performance to the managers' behavior; therefore, the choice of manager is even more risky. Our supplementary analysis, however, does

[10] The only exception might be industry experience as managers with industry experience have better-performing firms when combined with experienced founders.

not support this alternative explanation as the likelihood of hiring a similar manager does not increase in the industries with high volatility of returns.[11]

Finally, we investigated whether founders of small start-ups had different hiring preferences than founders of larger ventures. Perhaps, small firms require less variety of skills and backgrounds than larger start-ups and, therefore, founders of small ventures may be even more likely to choose managers based on homophily. Yet we did not find empirical support for this expectation. We defined small firms as ventures with five or fewer employees.[12] In general, their founders were no more likely to hire similar managers than founders of larger ventures. The only exception was regional experience: founders with regional experience were more likely to hire managers with similar regional experience and this effect was more pronounced in small firms. Also, contrary to our expectation, we found that founders of small firms were less likely to hire managers with the same level of education, same nationality, and same gender than founders of larger businesses.

Discussion and Conclusion

When entrepreneurs operate their firms themselves, they are criticized for a lack of business expertise and for being driven by non-pecuniary motives (e.g., Wasserman 2017). However, when, in line with this critique, they hire professional managers in their firms, such a manager may also not do well (e.g., Clarysse and Moray 2004). Perhaps entrepreneurs do not choose the right managers for their ventures or base their choice of manager on criteria other than profit maximization. In this paper, we come closer to answering this question by examining the choice of managers in new ventures started by entrepreneurs.

Our evidence is consistent with the idea that founders largely prefer to hire managers who are similar to them, and their choice is likely driven by their non-financial preference for working with similar others rather than network constraints and selection or profit maximization. While for some, often superior, entrepreneurs such choice may coincidentally be aligned with firm performance, in many cases the choice of manager is not positively associated with firm productivity. Our findings are in line with the prior studies that have observed that entrepreneurs are likely to form their founding teams based on homophily in order to achieve higher psychological comfort (e.g., Ruef et al. 2003). They are also consistent with recent work demonstrating that superior founders are more likely to higher superior employees (Honore and Ganco 2016; Rocha et al. 2016). Yet, whereas these studies largely attribute such tendencies to the self-selection of early employees into presumably better firms, our results are more consistent with the homophily explanation rather than employee self-selection.

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[11] In line with prior studies (e.g., Kulchina and Oxley 2017), we measure volatility as a standard deviation of our firm performance variable, (sales/employees)/10000, at the four-digit industry level over our observation period.

[12] We have experimented with other size cutoffs and observed similar results.

One exception to the observed tendency to hire similar managers is gender selection. We have found that female founders are much less likely to hire same-gender managers than male founders. Moreover, women entrepreneurs are even more likely to hire male managers than men entrepreneurs, and experience larger benefits from those managers. While this is contrary to some prior studies that expect gender homogeneity in new venture teams (e.g., Ruef et al. 2003; Steffens et al. 2012), our findings are consistent with Hoogendoorn et al. (2013), who demonstrate that gender diversity leads to superior entrepreneurial team performance.

Another notable observation is that less than a third of founders hire managers from their prior coworkers. Whereas prior studies suggest that entrepreneurs are likely to staff their ventures with former colleagues (e.g., Agarwal et al. 2016; Beckman 2006), our results show that this may happen less frequently for top-management positions.

Finally, some characteristics that had mixed impact on firm performance in prior self-employment studies, such as entrepreneurial experience and regional experience, have not been found to be superior in our setting. Yet founders who possess such characteristics have a higher tendency to hire similar managers despite the fact that they are not likely to experience positive impacts of their choices.

While we have used Portuguese entrepreneurs as a convenient setting that would allow us to identify founders and hired managers in new ventures, we expect that our findings can be generalized to a broader population of entrepreneurs. First, hired managers are also quite commonly found in start-ups from other countries, including the United States, Denmark, and Russia (e.g., Chen and Thompson 2015; Clarysse and Moray 2004; Kulchina and Gjerløv-Juel 2017; Kulchina and Oxley 2017; Wasserman 2017). Second, we have used a subsample of Portuguese owner-managers and their firms to confirm that the trends in our data are very similar to the ones found in numerous other institutional settings, including developed and emerging markets (e.g., Campbell 2013; Cooper et al. 1994; Dahl and Sorenson 2012; Delmar and Shane 2006; Dencker and Gruber 2015; Honore and Ganco 2016; Shane and Stuart 2002). While we would welcome replication of our results in other institutional environments, on the theoretical level our findings would still be important even if the magnitude of the effect may vary in other settings.

Overall, our results are consistent with the idea that founders' choice of top managers in new ventures is only partially aligned with firm performance. In many cases, founders hire managers whose attributes may negatively affect firm performance. This is particularly true for the founders who themselves lack characteristics that are positively associated with firm success and, therefore, may especially need "superior" managers. Conversely, founders with beneficial characteristics are likely to get similarly beneficial managers even if they hire such managers based on psychological preference. As a result, firms that are already good due to strong founders will become better, and firms that are disadvantaged due to less capable founders, and where founders are particularly in need of advanced human and social capital, will get even weaker. Thus, the situation when a firm, for example, has a founder who is a good engineer but a bad manager becomes tricky. A venture capital firm cannot just impose a professional manager on such a firm. It has been shown that founders resent managers who were forced on them, and this leads to poor firm performance (e.g., Clarysse and Moray 2004; Wasserman 2017). Yet one cannot not give such a founder complete freedom in choosing a manager because the founder will likely pick an individual who is similar to the founder but not necessarily best for the firm.

Taken together, our findings speak to several areas of the entrepreneurship literature. First, they directly contribute to the literature on founding team formation (e.g., Beckman and Burton 2008; Ruef et al. 2003) and the growing research on management of new ventures founded by entrepreneurs (e.g., Beckman and Burton 2008; Eesley et al. 2014; Wasserman 2017). Overall, our results suggest that founders strongly prefer to hire managers who are similar to them. This means that firms founded by entrepreneurs with baseline characteristics may be particularly disadvantaged.

These findings may also shed light on the prior empirical puzzles. First, entrepreneurs are often criticized for not being the best managers for their firms. However, when they decide to hire managers, such managers sometimes also fail to do well. Our findings suggest that while the intentions for hiring a manager may be good, the choice of manager may be misaligned with firm performance, especially among the founders who lack firm-operating skills and are particularly in need of managerial help. Second, prior studies have found contradicting results for the impact of team diversity. This may be due to the fact that those studies typically estimated an average effect across all team members, whereas we find that the effect may vary for founders with baseline and superior characteristics and, therefore, sample composition may determine which group dominates and determines the average effect.

Furthermore, our study points to a number of interesting regularities and opens a broad avenue for future research. For example, contrary to the popular expectation that individuals strongly prefer gender homophily, we find that female founders have a strong preference for male managers. We also find that manager’s industry experience is only beneficial for experienced founders. Additionally, we observe that only a third of the managers are former coworkers of entrepreneurs, which calls for further investigation of which colleagues future entrepreneurs are more likely to take with them when they leave. It is also worth exploring under which conditions founders are more likely to be driven by personal preferences versus more strategic considerations.

Finally, our study speaks to the growing literature on the role of entrepreneurs in their firms (e.g., Kor 2003). Prior work has largely treated an entrepreneur as a person who combines founding and managerial responsibilities, but individuals do not always simultaneously possess great founding and managerial skills. It is important to understand which characteristics are important for founding a promising firm and for successfully managing it. Our paper helps separate founders and managers and provides some suggestions on how founders may be able to compensate for the lack of relevant human capital by hiring a particular manager. However, further research is needed to understand the relative importance of demographic characteristics and experience for founding and managing a firm.

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Figure 1. The summary of theoretical predictions

Mechanism	Choice implications	Performance implications
H1: Superior characteristics	Entrepreneurs with superior and baseline characteristics will be **equally likely** to hire managers with superior characteristics.	The benefits from hiring a manager with a superior characteristic will be **equal** for firms founded by entrepreneurs with the superior and baseline characteristic.
H2: Benefits of diversity	Entrepreneurs with superior characteristics will be **less likely** to hire managers with superior characteristics than entrepreneurs with baseline characteristics.	The benefits from hiring a manager with a superior characteristic will be **smaller** for the firms founded by entrepreneurs with the superior characteristic than for the firms founded by entrepreneurs with the baseline characteristic.
H3a: Benefits of similarity	Entrepreneurs with superior characteristics will be **more likely** to hire managers with superior characteristics than entrepreneurs with baseline characteristics.	The benefits from hiring a manager with a superior characteristic will be **greater** for the firms founded by entrepreneurs with the superior characteristic than for the firms founded by entrepreneurs with the baseline characteristic.
H3b: Homophily	Entrepreneurs with superior characteristics will be **more likely** to hire managers with superior characteristics than entrepreneurs with baseline characteristics.	The benefits from hiring a manager with a superior characteristic will be **equal or smaller** for the firms founded by entrepreneurs with the superior characteristic than for the firms founded by entrepreneurs with the baseline characteristic.[a]
H3c: Network constraints and selection	Entrepreneurs with superior characteristics will be **more likely** to hire managers with superior characteristics than entrepreneurs with baseline characteristics.	The benefits from hiring a manager with a superior characteristic will be **equal or smaller** for the firms founded by entrepreneurs with the superior characteristic than for the firms founded by entrepreneurs with the baseline characteristic.[a]

a) In theory, there may exist a situation where a founder hires a similar manager due to homophily or choice set constraints, but coincidentally, such a similar manager also provides greater performance benefits. Yet, the founder is not taking these benefits into consideration. Such a situation is, however, unlikely and cannot be distinguished in our setting from the benefits of similarity mechanism since we can only infer but not know founders' true hiring motives. Therefore, we will classify such a situation under H3a and reserve H3b and H3c to the conditions that make a founder deviate from the profit-maximizing choice.

Figure 2. Summary of the founders' choice

Probability of hiring a manager with a given characteristic	The difference in the probability of hiring by the founder type			Consistent with hypothesis
P(male=1)	Female founder	>	Male founder	H2
P(same age)	Significantly more likely to hire a manager of the same age as the founder			H3
P(same education level)	Significantly more likely to hire a manager with the same level of education as the founder			H3
P(Foreign=1)	Portuguese founder	<	Foreign founder	H3
P(managerial experience=1)	Founder without top-management experience	<	Founder with top-management experience	H3
P(entrepreneurial experience=1)	Founder without entrepreneurial experience	<	Founder with entrepreneurial experience	H3
P(industry experience=1)	Founder without industry experience	<	Founder with industry experience	H3
P(regional experience=1)	Founder without regional experience	<	Founder with regional experience	H3

Figure 3. Summary of performance implications of hiring a manager with superior characteristics relative to a manager with baseline characteristics

Manager's characteristics	Association with firm performance			Consistent with mechanism
Male manager	Female founder +	>	Male founder +	Benefits of diversity
Manager age 20–40	Founder 40–60 +	>	Founder 20–30 0	Homophily/ Network constraints and selection[a]
Manager with medium and high education	Founder with low or very low education +	=	Founder with medium or high education +	Homophily/ Network constraints and selection[a]
Portuguese manager	Foreign founder +	=	Portuguese founder +	Homophily/ Network constraints and selection[a]
Manager with industry experience	Founder without industry experience 0	<	Founder with industry experience +	Benefits of similarity
Manager with entrepreneurial experience	Founder without entrepreneurial experience 0	=	Founder with entrepreneurial experience 0	
Manager with top-management experience	Founder without top-management experience +	=	Founder with top-management experience +	Homophily/ Network constraints and selection[a]
Manager with regional experience	Founder without regional experience 0	>	Founder with regional experience -	

a) Additional analyses suggest that our findings are more consistent with the homophily explanation than with the network constraints and selection mechanism.

Table 1. Difference in means for founders and hired managers

Variables	(1) Obs	(2) Founders	(3) Hired Manager	(4) Difference between (3) and (2)
Male	5,043	0.69	0.63	-0.06***
		(0.01)	(0.01)	(0.01)
Age	5,043	37.51	37.42	-0.09
		(0.13)	(0.13)	(0.15)
Years of education	5,043	9.77	9.86	0.09*
		(0.06)	(0.06)	(0.05)
Foreign	5,043	0.03	0.03	0.00
		(0.00)	(0.00)	(0.00)
Managerial experience	5,043	0.15	0.18	0.03***
		(0.00)	(0.01)	(0.01)
Entrepreneurial experience	5,043	0.13	0.16	0.03***
		(0.00)	(0.01)	(0.01)
Industry experience	5,043	0.18	0.25	0.07***
		(0.01)	(0.01)	(0.01)
Regional experience	5,043	0.76	0.79	0.03***
		(0.01)	(0.01)	(0.01)
Average hourly wage	1,245	6.74	6.28	-0.46**
		(0.19)	(0.17)	(0.19)

Notes: N=5,043 obs. Standard errors are in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 2. Proportion of similar founders and hired managers

Variables	Obs.	Mean	Std. Dev.
Same gender	5,043	0.55	0.50
Same male	3,467	0.63	0.48
Same female	1,576	0.36	0.48
Same age bracket	5,043	0.53	0.50
Age 20–29	1,127	0.47	0.50
Age 30–39	1,954	0.60	0.49
Age 40–49	1,326	0.53	0.50
Age 50–60	636	0.39	0.49
Same education	5,043	0.61	0.49
Very low education	935	0.57	0.50
Low education	1,965	0.66	0.47
Medium education	1,312	0.56	0.50
High education	831	0.60	0.49
Same nationality	5,043	0.97	0.16
Portuguese	4,893	0.99	0.12
Foreign	150	0.62	0.49
Same managerial experience	3547	0.70	0.46
With experience	738	0.30	0.46
Without experience	4305	0.84	0.36
Same entrepreneurial experience	5,043	0.78	0.42
With experience	661	0.25	0.43
Without experience	4,382	0.86	0.35
Same industry experience	5,043	0.72	0.45
With experience	893	0.43	0.50
Without experience	4150	0.79	0.41
Same regional experience	3547	0.62	0.49
With experience	3820	0.84	0.37
Without experience	1223	0.37	0.48
Same parent firm	5,043	0.30	0.46
Same parent age bracket	3,547	0.30	0.46
Start-up (<=7 years)	793	0.34	0.47
Adolescence (8–19)	803	0.13	0.34
Established (>=20)	1,951	0.35	0.48
Same parent region	3,547	0.16	0.36
Same region	1,154	0.40	0.49
Different region	2,393	0.04	0.19
Same parent firm size	3,547	0.21	0.41
Micro	793	0.28	0.45
Small	981	0.29	0.45
Medium	329	0.07	0.26
Large	1,444	0.15	0.35
Same parent ownership structure	3547	0.30	0.46
Foreign	1719	0.31	0.46
Domestic	1794	0.55	0.50
Government	26	0.00	0.00

Table 3. Probability of hiring a manager with a given characteristic

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Variables	**Hired Manager Characteristics**													
	Male	Age 20–29	Age 30–39	Age 40–49	Age 50–60	Very low edu.	Low edu.	Medium edu.	High edu.	Foreign	Manag. exper.	Entrepr. exper.	Industry exper.	Reg. exper.
Founder Charact.														
Male	**-0.107****	0.042	0.148***	-0.148***	-0.116**	0.030	-0.001	-0.013	0.010	0.149	-0.047	-0.071	-0.021	-0.060
	(0.042)	(0.049)	(0.043)	(0.046)	(0.055)	(0.061)	(0.044)	(0.046)	(0.058)	(0.110)	(0.066)	(0.070)	(0.046)	(0.047)
Age 30–39	-0.179***	**-1.024*****	**0.839*****	0.242***	-0.367***	-0.243***	-0.097*	0.198***	0.004	0.374**	-0.092	-0.011	-0.028	-0.007
	(0.053)	**(0.055)**	**(0.051)**	(0.060)	(0.070)	(0.080)	(0.056)	(0.058)	(0.072)	(0.153)	(0.081)	(0.091)	(0.058)	(0.058)
Age 40–49	-0.282***	**-1.119*****	-0.182***	**1.305*****	-0.115	-0.370***	-0.238***	0.290***	0.231***	0.419***	-0.258***	0.038	0.030	0.099
	(0.060)	**(0.064)**	(0.059)	**(0.063)**	(0.074)	(0.088)	(0.064)	(0.067)	(0.084)	(0.160)	(0.096)	(0.103)	(0.066)	(0.067)
Age 50–60	-0.320***	**-0.984*****	-0.277***	0.414***	**1.111*****	-0.624***	-0.240***	0.356***	0.460***	0.262	-0.221*	-0.014	0.188**	0.097
	(0.073)	**(0.080)**	(0.075)	(0.080)	**(0.082)**	(0.112)	(0.079)	(0.083)	(0.101)	(0.177)	(0.121)	(0.124)	(0.079)	(0.085)
Low	0.008	-0.349***	-0.129**	0.149**	0.386***	**-1.497*****	**0.954*****	0.379***	0.127	-0.130	-0.035	-0.011	0.077	0.057
education	(0.061)	(0.072)	(0.064)	(0.066)	(0.085)	**(0.068)**	**(0.056)**	(0.069)	(0.098)	(0.145)	(0.104)	(0.093)	(0.066)	(0.072)
Medium	0.011	-0.650***	-0.134*	0.249***	0.699***	**-1.792*****	-0.125*	**1.440*****	0.591***	0.067	-0.053	0.091	0.072	-0.067
education	(0.072)	(0.087)	(0.074)	(0.080)	(0.101)	**(0.093)**	(0.066)	**(0.074)**	(0.100)	(0.166)	(0.122)	(0.116)	(0.078)	(0.083)
High	0.068	-0.758***	-0.132	0.294***	0.812***	**-2.032*****	-0.327***	0.529***	**1.722*****	-0.051	0.080	-0.059	0.132	0.036
education	(0.084)	(0.102)	(0.088)	(0.095)	(0.121)	**(0.127)**	(0.082)	(0.089)	**(0.105)**	(0.193)	(0.137)	(0.150)	(0.094)	(0.097)
Foreign	-0.277**	0.054	0.108	-0.044	-0.150	0.139	0.105	-0.266*	0.310	**2.539*****	-0.136	-0.019	-0.095	-0.208
	(0.135)	(0.159)	(0.138)	(0.156)	(0.206)	(0.225)	(0.149)	(0.144)	(0.191)	**(0.136)**	(0.229)	(0.268)	(0.151)	(0.150)
Managerial	-0.060	0.278***	-0.054	-0.094	-0.147	-0.024	-0.118	0.216**	-0.205*	-0.041	**0.383*****	-0.226*	-0.048	-0.078
experience	(0.081)	(0.095)	(0.084)	(0.089)	(0.120)	(0.133)	(0.088)	(0.089)	(0.106)	(0.191)	**(0.130)**	(0.131)	(0.089)	(0.086)
Entrepr.	-0.076	-0.144	0.160*	0.029	-0.155	-0.129	0.115	-0.123	0.189*	0.066	-0.016	**0.374*****	-0.207**	0.230**
experience	(0.084)	(0.098)	(0.087)	(0.091)	(0.128)	(0.132)	(0.090)	(0.094)	(0.112)	(0.209)	(0.142)	**(0.134)**	(0.092)	(0.092)
Industry	0.022	0.082	-0.067	0.013	0.029	-0.000	-0.039	0.003	0.135*	-0.039	-0.243***	0.082	**0.621*****	-0.075
experience	(0.053)	(0.062)	(0.055)	(0.059)	(0.076)	(0.074)	(0.055)	(0.060)	(0.076)	(0.130)	(0.089)	(0.090)	**(0.053)**	(0.058)
Regional	-0.034	-0.036	0.020	0.055	-0.111*	-0.004	0.041	0.012	-0.075	0.031	-0.128*	0.103	0.032	**0.596*****
experience	(0.046)	(0.053)	(0.047)	(0.051)	(0.061)	(0.068)	(0.048)	(0.050)	(0.061)	(0.105)	(0.073)	(0.080)	(0.050)	**(0.046)**
Control variables	Hired manager characteristics; firm size at founding; dummies for the region of location, industry, and founding year; constant.													

Notes: N=5,043 obs. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Performance of firms with hired managers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Gender	Age	Education	Nationality	Industry exp.	Entrepreneurial exp.	Managerial exp.	Regional exp.
Focal Manager Charact.								
Male manager	0.188*** (0.051)							
Manager age 40–60		0.031 (0.043)						
Manager with medium or high educ.			0.081* (0.042)					
Portuguese manager				0.302** (0.151)				
Manager with industry exp.					-0.051 (0.036)			
Manager with entrepreneurial exp.						-0.055 (0.071)		
Manager with managerial exp.							0.139* (0.072)	
Manager with regional exp.								0.012 (0.052)
Founder Charact * Hired Manager Charact.								
Male founder*Male manager	-0.131** (0.060)							
Founder age 40–60*Manager age 40–60		-0.118** (0.059)						
Founder with medium or high educ.*Manager with medium or high educ.			-0.035 (0.066)					
Portuguese founder*Portuguese manager				-0.277 (0.186)				
Founder with industry exp.* Manager with industry exp.					0.125* (0.069)			
Founder with entrepreneurial exp.* Manager with. entrepreneurial exp.						0.019 (0.098)		
Founder with managerial exp.* Manager with managerial exp.							0.101 (0.090)	
Founder with regional exp.* Manager with regional exp.								-0.121* (0.065)
Control variables	Founder characteristics; hired manager non-focal characteristics; firm age; dummies for the region of location, industry, and founding year; constant.							

Notes: N=24,082 obs. DV=ln(Sales/Employees). Clustered errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Complete table with all variables can be found at http://www.kulchina.com/uploads/7/4/7/6/74767023/topmanagers_table4.xlsx

Appendices

Appendix 1: Main variables and their definitions.

Variable	Definition
Male	Dummy variable that equals 1 for male and 0 for female individuals
Age	Age of the founder/manager in the year of hiring a manager
Age dummies	Dummy variables for age (age 20–30, 20–40, 40–50, 50–60). A dummy variable equals 1 if an individual belongs to the respective age group and 0 otherwise. The 50–60 group includes individuals up to 62 years of age.
Very low education	Dummy variable that equals 1 for individuals who never attended or completed the elementary school and 0 otherwise
Low education	Dummy variable that equals 1 for individuals that attended junior high school and 0 otherwise
Medium education	Dummy variable that equals 1 for individuals reporting a high school diploma or vocational school degree and 0 otherwise
High education	Dummy variable that equals 1 for individuals with bachelor, master's, or doctoral degrees, and 0 otherwise
Foreign	Dummy variable that equals 1 for an individual born outside of Portugal and 0 for Portuguese individuals
Portuguese	Dummy variable that equals 1 for an individual born in Portugal and 0 otherwise
Managerial experience[a]	Dummy variable that equals 1 for individuals who worked in management positions and 0 otherwise
Entrepreneurial experience[a]	Dummy variable that equals 1 for individuals who have previously founded a firm and 0 otherwise
Industry experience[a]	Dummy variable that equals 1 for individuals who established (founder) or joined (top manager) the venture in the same four-digit industry where they previously worked, 0 otherwise
Regional experience[a]	Dummy variable that equals 1 for individuals that established (founder) or joined (top manager) a venture in the same municipality where they have previously worked and 0 otherwise
Average hourly salary	Individual's hourly salary in the year prior to founding (founder) or joining (top manager)
Firm size	Logged number of the start-up employees in the year of founding
Ln(sales/employees)	Logged value of sales per employee in the year of observation

a) Experience is measured in the five years prior to founding (for founders) or joining (for managers) the start-up.

Appendix 2: Performance of firms with managing founders

Variables	(1)
Start-up Characteristics	
Firm age	0.306***
	(0.003)
Founder-Manager Characteristics	
Male	0.136***
	(0.010)
Age 40–60	-0.047***
	(0.009)
Medium and high education	0.185***
	(0.011)
Foreign	-0.222***
	(0.027)
Entrepreneurial experience	-0.007
	(0.020)
Managerial experience	0.098***
	(0.020)
Industry experience	0.053***
	(0.011)
Regional experience	-0.036***
	(0.010)
Constant	9.935***
	(0.311)
Observations	209,545

Notes: DV=ln(Sales/Employees). Clustered errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix 3: Descriptive statistics at the firm level

Variables	Firms with Managing Founders					Firms with Hired Managers				
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min.	Max.
Initial size	54,209	3.14	4.66	1.00	276.00	5,043	3.17	2.92	1.00	83.00
Initial number of establishments	54,209	1.02	0.18	1.00	9.00	5,043	1.03	0.22	1.00	8.00
Initial sales	40,145	105,180	1,049,288	0.00	148,000,000	4,606	123,289	654,367	0.00	36,800,000
3-year survival rate	54,209	0.61	0.49	0.00	1.00	5,043	0.82	0.39	0.00	1.00
Sales (euros)	224,108	254,643	1,002,402	0.00	148,000,000	32,146	363,926	1,155,828	0.00	49,600,000
Employees	293,442	4.46	8.03	1.00	809.00	39,177	5.31	10.16	1.00	400.00
Sales/employees (euros)	224,108	60,664	265,253	0.00	60,200,000	32,146	67,641	184,217	0.00	18,400,000
Ln(sales/employees)	209,545	10.43	1.03	4.28	17.91	30,349	10.55	1.03	5.55	16.73

Appendix 4: Descriptive statistics at the individual level

	Firms with Managing Founders					Firms with Hired Managers									
	Founder-Manager					Founder					Hired Manager				
	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max	Obs.	Mean	Std. Dev.	Min	Max
Male	54,209	0.71	0.45	0.00	1.00	5,043	0.69	0.46	0.00	1.00	5,043	0.63	0.48	0.00	1.00
Age	54,209	37.35	9.14	20.00	60.00	5,043	37.51	9.33	20.00	62.00	5,043	37.42	9.45	20.00	62.00
Age 20–29	54,209	0.22	0.41	0.00	1.00	5,043	0.22	0.42	0.00	1.00	5,043	0.23	0.42	0.00	1.00
Age 30–39	54,209	0.39	0.49	0.00	1.00	5,043	0.39	0.49	0.00	1.00	5,043	0.38	0.49	0.00	1.00
Age 40–49	54,209	0.27	0.44	0.00	1.00	5,043	0.26	0.44	0.00	1.00	5,043	0.26	0.44	0.00	1.00
Age 50–60	54,209	0.12	0.32	0.00	1.00	5,043	0.13	0.33	0.00	1.00	5,043	0.13	0.33	0.00	1.00
Years of education	54,209	9.59	4.31	0.00	23.00	5,043	9.77	4.28	0.00	23.00	5,043	9.86	4.25	0.00	23.00
Very low education	54,209	0.19	0.39	0.00	1.00	5,043	0.19	0.39	0.00	1.00	5,043	0.17	0.37	0.00	1.00
Low education	54,209	0.41	0.49	0.00	1.00	5,043	0.39	0.49	0.00	1.00	5,043	0.40	0.49	0.00	1.00
Medium education	54,209	0.24	0.43	0.00	1.00	5,043	0.26	0.44	0.00	1.00	5,043	0.27	0.44	0.00	1.00
High education	54,209	0.16	0.37	0.00	1.00	5,043	0.16	0.37	0.00	1.00	5,043	0.17	0.37	0.00	1.00
Foreign	54,209	0.04	0.20	0.00	1.00	5,043	0.03	0.17	0.00	1.00	5,043	0.03	0.18	0.00	1.00
Managerial experience	54,209	0.15	0.36	0.00	1.00	5,043	0.15	0.35	0.00	1.00	5,043	0.18	0.38	0.00	1.00
Entrepreneurial experience	54,209	0.15	0.35	0.00	1.00	5,043	0.13	0.34	0.00	1.00	5,043	0.16	0.37	0.00	1.00
Industry experience	54,209	0.21	0.41	0.00	1.00	5,043	0.18	0.38	0.00	1.00	5,043	0.25	0.43	0.00	1.00
Regional experience	54,209	0.76	0.42	0.00	1.00	5,043	0.76	0.43	0.00	1.00	5,043	0.79	0.41	0.00	1.00
Average hourly wage	24,486	6.12	6.57	0.13	366.54	2,204	6.44	6.08	1.55	79.09	2,433	6.00	5.63	1.41	78.59

Appendix 5: Marginal effects for the probit models from Table 3[a]

	Marginal Effects
Male	-0.04
Age 20–30	Reference group
Age 30–39	0.32
Age 40–49	0.44
Age 50–60	0.28
Very low education	Reference group
Low education	0.36
Medium education	0.50
High education	0.49
Foreign	0.58
Managerial experience	0.07
Entrepreneurial experience	0.05
Industry experience	0.21
Regional experience	0.18

a) Marginal effect of moving from 0 to 1

Appendix 6: The association of founders' and managers' characteristics firm performance. Firms with hired managers only.

Variables	(1)	(2)	(3)
Start-up Characteristics			
Firm age	0.242***	0.243***	0.241***
	(0.012)	(0.012)	(0.012)
Founder Characteristics			
Male	0.078***		0.085***
	(0.029)		(0.029)
Age 40–60	0.030		0.046
	(0.026)		(0.029)
Medium and high education	0.154***		0.111***
	(0.032)		(0.035)
Foreign	-0.188**		-0.124
	(0.077)		(0.096)
Industry experience	0.021		0.022
	(0.035)		(0.035)
Entrepreneurial experience	0.077		0.082
	(0.064)		(0.064)
Managerial experience	0.111*		0.097
	(0.062)		(0.063)
Regional experience	-0.093***		-0.071**
	(0.031)		(0.032)
Manager Characteristics			
Male		0.083***	0.094***
		(0.028)	(0.028)
Age 40–60		-0.007	-0.024
		(0.027)	(0.030)
Medium and high education		0.127***	0.065*
		(0.030)	(0.033)
Foreign		-0.173**	-0.113
		(0.070)	(0.090)
Industry experience		-0.014	-0.021
		(0.032)	(0.032)
Entrepreneurial experience		-0.051	-0.052
		(0.069)	(0.070)
Managerial experience		0.175**	0.160**
		(0.068)	(0.069)
Regional experience		-0.086***	-0.068**
		(0.031)	(0.032)
Constant	8.636***	8.597***	8.437***
	(0.197)	(0.206)	(0.211)
Observations	24,082	24,082	24,082

Notes: DV=ln(Sales/Employees). Clustered errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1