



Path to entrepreneurship and business succession: Antecedents and performance consequences

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Preface

Family firm and entrepreneurship are two widely discussed themes in academics, and they are closely related to business practice. Among the massive subtopics in these two fields, firm survival and family firm succession are two interesting topics that are of great importance for the development and sustainability of businesses. I am beyond happy that I could have a chance to do research that are related to these two topics.

During my four-year Ph.D. study, I received tremendous help from my supervisors, colleagues, families and friends. I would like to take this opportunity to express my gratitude to these people.

First of all, I would like to thank my supervisor, Prof. Dr. Jörn Block, for his instruction and help in supporting my study. The intense discussions with Prof. Block regarding the design of research questions and the structure of my dissertation have benefited me a lot. His insightful comments have inspired me to try out new ideas and methods to deal with problems that appear at first sight to be unsolvable, but actually turn out to be something fruitful. More importantly, Prof. Block has shown me his passion and devotion to research, which will always be an inspiration for me. I am grateful for him accepting me as a Ph.D. student at the beginning, as well as his instructions and suggestions that guided me through the past four years. Moreover, I would like to thank my second supervisor, Prof. Dr. Roy Thurik, for his insightful comments on my dissertation and contribution to our joint work, as well as his kind support when I went to Erasmus University to attend research seminars.

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List of abbreviations

ACCRE	Aide au Chômeur Créant ou Reprenant une Entreprise (Aid for unemployed people to create or take over a business)
CEO	Chief executive officer
Ed. / eds.	Editor / editors
Et al.	et alii (and others)
Etc.	Et cetera (and so on)
EU	European Union
E.g.	Exempli gratia (for example)
F-PEC	Family – Power, Experience and Control
GDP	Gross domestic product
I.e.	Id est (that is)
IFERA	International Family Enterprise Research Academy
INSEE	Institut National de la Statistique et des Études Économiques (National Institute of Statistics and Economic Studies, France)
NAF	Nomenclature d'Activités Française (French Classification of Activities)
PSM	Propensity score matching
ROA	Return on assets
RQ	Research question
SEW	Socioemotional wealth
SINE	Système d'Information sur les Nouvelles Entreprises (New Enterprises Information System)
SIREN	Système d'Identification du Répertoire des Entreprises (this is a unique identification number for French businesses)
SIRENE	Système Informatisé du Répertoire National des Entreprises et des Établissements (National Enterprise and Establishment Register Database)
SME	Small and medium-sized enterprises

List of abbreviations (continued)

UK	United Kingdom
US	United States
TMT	Top management team
VIF	Variance inflation factor
Vs.	versus
W.l.o.g	Without loss of generality
W.r.t	With respect to

Zusammenfassung

Für Unternehmensgründer gibt es zwei entscheidende Meilensteine: Erstens, wenn sie ihr Unternehmen gründen, und zweitens, wenn sie über die Zukunft des Unternehmens entscheiden. Diese Dissertation untersucht die Einrichtung von neu gegründeten und Übernahme von bestehenden Unternehmen sowie die Nachfolge in Familienunternehmen. Insbesondere werden das Verhalten und die Leistung der Unternehmensgründer in diesen beiden wichtigen Phasen der Unternehmensgründung erforscht. Im ersten Teil untersucht diese Arbeit die Auswirkungen von individuellen Eigenschaften und betrieblichen Merkmalen auf die Entscheidung von Unternehmensgründer in Bezug auf das Starten eines neuen Unternehmens und den Kauf eines bestehenden Unternehmens. Im zweiten Teil vergleicht diese Arbeit den Erfolg in Form der Überlebensrate von neu gegründeten und übernommenen Unternehmen. Zuletzt thematisiert die Arbeit die Managementnachfolge in Familienunternehmen.

Die empirischen Ergebnisse dieser Arbeit zeigen, dass eine vorherige Beschäftigung des Unternehmers in kleinen Unternehmen die Wahrscheinlichkeit für eine Unternehmensübernahme erhöht, während die Managementenerfahrung und die industriespezifische Erfahrung eine neue Unternehmensgründung fördert. Darüber hinaus untersucht diese Arbeit die Entscheidungsfaktoren mit einer Stichprobe von Hybrid-Unternehmern, die gleichzeitig Unternehmer und Angestellte sind. Es zeigt sich, dass die Wahl zwischen den zwei Arten von Entrepreneurship mit unternehmerischen Eigenschaften und betrieblichen Merkmalen zusammenhängt. Im Speziellen werden vier Faktoren identifiziert, nämlich die Berufserfahrungen, das Bildungsniveau, das Geschlecht der Gründer und der Standort der Unternehmen.

Der Erfolg der Unternehmensgründung wird zwischen neu gegründeten und übernommenen Unternehmen in Bezug auf ihre Überlebensraten verglichen. Unter Verwendung eines großen französischen Datensatzes stellt die vorliegende Arbeit eine höhere Überlebensrate bei übernommenen Unternehmen als bei neu gegründeten Unternehmen fest. Weiterhin wird gezeigt, dass drei Überlebensfaktoren die zwei Arten von Unternehmensgründung unterschiedlich beeinflussen. Die Berufserfahrung des Unternehmers in kleinen Unternehmen und die Motivation, eine Geschäftschance auszunutzen, erhöhen die Überlebensraten für neu gegründete Unternehmen. Des Weiteren stellt diese Arbeit eine negative Beziehung zwischen den Überlebensraten der übernommenen Unternehmen und öffentlicher Subventionen fest.

Mit Hilfe eines Multitask Prinzipal-Agenten-Modells analysiert diese Arbeit abschließend die Managementnachfolge in Familienunternehmen. In diesem Modell entscheidet sich ein Familienunternehmer zwischen einem Familienmitglied und einem Nicht-Familienmitglied als zukünftigen Manager, der zwei Aufgaben hat, um die wirtschaftlichen und die nicht-wirtschaftlichen Ziele des Familienunternehmens zu erfüllen. Die Beziehung zwischen den beiden Aufgaben kann substituierbar oder komplementär sein. Wenn der Familienmanager und der Nichtfamilien-Manager asymmetrische Fähigkeiten haben, hängt die Einstellungsentscheidung des Familienunternehmers von der Beziehung zwischen den beiden Zielen und der Messbarkeit der Ziele ab. Genauer gesagt, wenn die wirtschaftlichen und nicht-wirtschaftlichen Aufgaben stark substituierbar sind, wird der Nichtfamilien-Manager eingestellt. Je komplementärer die beiden Aufgaben jedoch werden, desto wahrscheinlicher ist es, dass der Familienmanager eingestellt wird. Des Weiteren wird gezeigt, dass die Wahrscheinlichkeit einen Familienmanager einzustellen höher ist, wenn die Aufgaben des Managers besser gemessen werden oder der Familienmanager stärker für das Familienunternehmen sorgen wird.

Diese Dissertation leistet einen Beitrag zur Literatur über Unternehmensgründungen und Familienunternehmen. Einerseits erweitert diese Arbeit unser Wissen über die Einflussfaktoren der Unternehmensgründer in Bezug auf die Wahl zwischen der Gründung und der Übernahme eines Unternehmens. Neben den Auswirkungen von Sozialkapital, Bildungsniveau und Geschlecht auf die Entscheidung, ein neues Unternehmen zu gründen oder ein etabliertes Unternehmen zu übernehmen, schlägt diese Arbeit die Berufserfahrung des Unternehmensgründers als einen weiteren Faktor vor. Darüber hinaus trägt diese Arbeit zu bisherigen Studien bezüglich der Überlebensfähigkeit von Unternehmen bei, die sich stark auf neu gegründete Unternehmen konzentrieren, übernommene Unternehmen jedoch vernachlässigen. Die vorliegende Arbeit füllt diese Lücke und zeigt, dass sich die übernommenen Unternehmen von neu gegründeten Unternehmen in Bezug auf Überlebensraten und Überlebensfaktoren unterscheiden. Diese Untersuchung leistet andererseits einen Beitrag zur Literatur für Top-Management-Einstellungen in Familienunternehmen: Sie findet heraus, dass die Einstellungsentscheidung zwischen einem Familienmanager und Nichtfamilien-Manager nicht nur von den Fähigkeiten des Managers abhängt, sondern auch von der Beziehung zwischen den wirtschaftlichen und nicht-wirtschaftlichen Zielen des Familienunternehmens sowie der Messbarkeit dieser Ziele.

1 Introduction

1.1 Motivation

Every entrepreneur faces two crucial milestones: starting the business, and determining the future of the business when the entrepreneur is ready to exit. This dissertation focuses on these two critical points, namely the “birth” and the “death” of an entrepreneurial activity, and reveals determinants that can influence entrepreneurial behavior and performance.

Before introducing detailed research questions and the thesis’ structure in Sections 1.2 and 1.3, the following two subsections present a short review of relevant research as well as the relevance of the topics in this dissertation to the business field by providing information on start-up survival.

1.1.1 Research on new venture start-up, business takeover, and family firm succession

At the onset of entrepreneurship, individuals can choose among various paths to become an entrepreneur. In the pioneering work of Cooper and Dunkelberg (1986), the authors analyze four types of entrepreneurship paths defined according to how individuals achieve business ownership by either creating a new firm, acquiring an outside firm, purchasing a former employer’s firm, or inheriting a family firm. Among these paths, new venture start-up and outside business takeover are the two most common entrepreneurship entry modes. According to Cooper and Dunkelberg (1986), who describe the four entrepreneurship paths by the “degree of entrepreneurship,” creating a new firm is a more entrepreneurial path than acquiring an outside firm. Moreover, a further analysis of entrepreneurs’ background and characteristics show that “those [entrepreneurs] who follow different paths to business ownership appear to differ in a number of ways” (Cooper and Dunkelberg, 1986, p. 67). Following this seminal work, recent studies have emerged that investigate the relationship between entrepreneurship entry modes distinguished by new venture start-up and business takeover, and the entrepreneurs’ and/or the firms’ characteristics. For instance, significant differences have been found between the mode of entry and the entrepreneurs’ formal and informal

human capital (Parker and Van Praag, 2012), social and financial capital (Bastié et al., 2013), individual-level and country-level characteristics (Block et al., 2013b), and entrepreneurs' gender (Kay and Schlömer-Laufen, 2016).

In the last stage of an entrepreneurial activity, entrepreneurs need to determine the fate of the business: whether to sell or liquidate the firm or to pass the firm on to the next generation. The first two options proclaim the closure of entrepreneurial activity since the entrepreneur will lose control over the firm after liquidation or ownership transfer. In entrepreneurship literature, a significant number of papers have studied individual- and firm-level factors that either enhance or reduce the likelihood of survival of new ventures (e.g., Audretsch and Mahmood, 1995; Castrogiovanni, 1996; Gimeno et al., 1997). However, previous literature on firm survival determinants shows inconsistent results regarding entrepreneur- or firm-related factors, such as entrepreneur's management experience (e.g., Bates, 1990; Cooper et al., 1994; Duchesneau and Gartner, 1990), gender (e.g., Bosma et al., 2004; Boyer and Blazy, 2014; Headd, 2003), and firm size at entry (e.g., Agarwal and Audretsch, 2001; Klapper and Richmond, 2011). Wennberg et al., (2010) note that the discrepancies among previous findings may be because those findings only focus on firms' exit routes and neglect firms' financial status preceding their exit. For example, an entrepreneur's human capital has a different impact on new ventures' exit rates when those ventures perform well versus those that do not perform well before their closure. Another explanation for inconsistent findings may be that different types of entrepreneurship paths have disparate survival chances. Previous findings show that business takeovers are more profitable and more likely to survive than new venture start-ups (Bates, 1990; Dyke et al., 1992). In a recent paper by De Jong and Marsili (2015), business takeover (versus new venture start-up) is deemed to have a significant moderating role in the relationship between entrepreneurial ties and firm survival.

Another way for an entrepreneur to continue his or her business is to pass the firm on to the next generation of his or her family. In doing so, the entrepreneur (founder) can keep control of the firm in the hands of his or her family. According to Chua et al. (1999), a firm owned by the business founder or the business-owning family that intends to pass the firm down to the next generation is defined as a family firm. For family firm founders, selecting a new manager to take over management responsibility is a difficult task, because they oftentimes have to decide whether management should be handled by familial successors or professional managers (Lee et al., 2003). By selecting

a family manager, family firms can reduce principal-agent cost, since the family member's behavior can be more efficiently monitored and his or her objectives can be better aligned with that of the family (Chrisman et al., 2004; Jensen and Meckling, 1976; Schulze et al., 2003). However, nonfamily managers can be a better choice for a family firm since they are often selected based upon a rigid recruitment process that attracts highly qualified professionals competing for the job (Burkart et al., 2003).

Previous research has linked individual and firm characteristics with entrepreneurship entry modes and firm survival. It has also provided arguments and evidence that supports within-family or outside-family management succession. Yet, research gaps still exist. First, the limited number of papers that address the differences between the new venture start-up path and business takeover path do not distinguish entrepreneur type, nor do they examine firm survival determinants. Regarding family firm management succession, no research exists that investigates whether a family firm's decision to hire family managers or nonfamily managers is determined by the firm's goals and the relationship between different types of goals. This dissertation aims to fill these research gaps through empirical research and by using an economic modeling method.

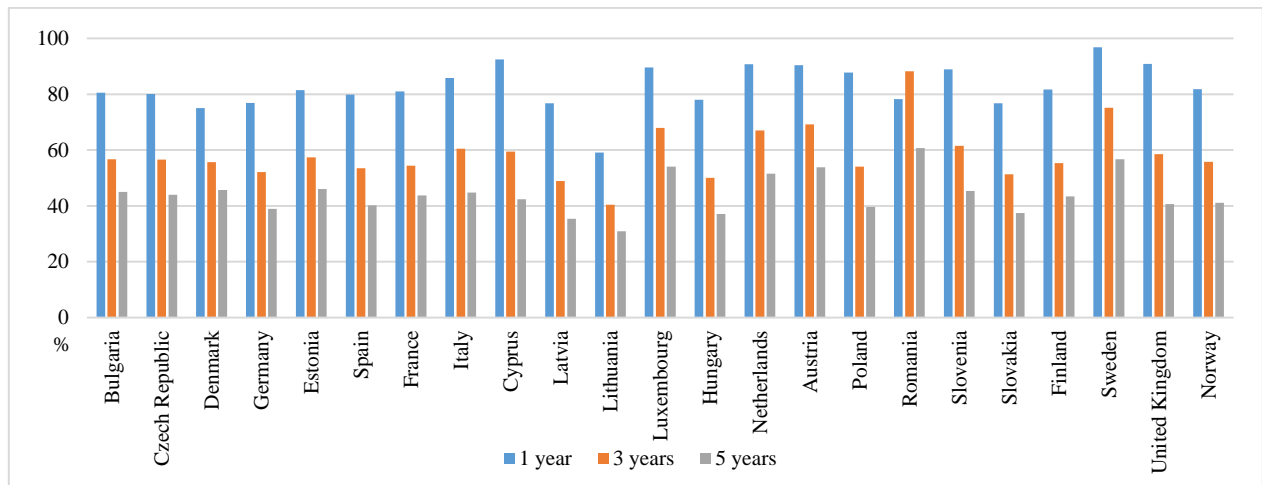
1.1.2 Survival rate of new venture start-ups and business takeovers

While several paths to entrepreneurship exist, this dissertation focuses on the new venture start-up path and the business takeover path. The reason for excluding management buyout and family firm takeover is that the opportunity of acquiring a former employer's firm or inheriting a family business is limited to the firm's employees or family members, respectively. The subjects of this dissertation are new firm creators and business acquirers who had, preceding entrepreneurship, a theoretically equal probability of choosing between starting a new firm and purchasing an existing business. This dissertation uses the definitions from the French National Institute of Statistics and Economic Studies (INSEE) to define and differentiate these two paths to entrepreneurship. According to INSEE, *new venture start-up* refers to a new venture that will be attributed to a new and exclusive registration number when it is created, whereas *business takeover* happens when an individual purchases an existing venture.

New venture start-ups suffer from "liability of newness" (Aldrich and Auster, 1986; Bates, 1990), and are challenged by technology development and market competition in and outside the domestic market. Eurostat statistics report that in EU countries, nearly 83% of new venture start-

ups created in 2009 survived after one year, but the survival rate dropped drastically to 59% in 2012. By 2014, only 44% of the firms that started in 2009 were still active.¹ Figure 1-1 shows the survival rates of start-ups founded in 2009 at the observation year 2010, 2012, and 2014 across 23 EU countries. Of all the countries, Sweden is reported to have the highest survival rate for new venture start-ups at the first observation year, whereas Lithuania has the lowest survival rate for new venture start-ups after one year of operation.

Figure 1-1: Survival rates for new venture start-ups after 1, 3 and 5 years across EU countries



Notes: Croatia, Greece, Malta, Ireland, Portugal, and Belgium are not included due to missing data. Romania: data break in series.

Data source: Eurostat: Business demography statistics. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Business_demography_statistics on March 7th, 2017.

With respect to the survival chances for business takeovers, Bates (1990) uses a sample of entrepreneurs who either created or acquired a small business between 1976 and 1982 to analyze the relationship between entrepreneur human capital and firm exit rates. The author finds that acquired small businesses survive longer than newly founded ones. He attributes the higher survival rates for takeovers to their established managerial practices, which newly founded firms need time to establish. Although takeovers are more successful than new venture start-ups in prolonging business life, the survival rates for business takeovers are not optimistic. The European Commission estimates that each year 690,000 SMEs constituting 2.8 million jobs will be transferred, and over

¹ Eurostat: Business demography statistics. Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Business_demography_statistics on July 14th, 2017.

one third of these business transfers will fail.² In light of the importance of SMEs to economy and employment, the EU launched several projects, including the Entrepreneurship 2020 Action Plan to facilitate the business ownership transfer process and to provide aid for further developing transferred businesses.

1.2 Research questions

1.2.1 Paths to entrepreneurship: new venture start-up and business takeover (Chapter 2-4)

New venture start-up and business takeover are distinguished by uncertainty and founding capital. Business takeovers are less risky than new venture start-ups (Bastié et al., 2013; Block et al., 2013b; Parker and Van Praag, 2012). New venture start-ups have a higher standard deviation of income than business takeovers (Parker and Van Praag, 2012) because they face more market uncertainties resulting from market entry barrier and competition. Business takeovers with track records of revenues and credit history are more attractive to investors or loaners than new venture start-ups, as reflected by the finding of Bastié et al. (2013), which shows that business takeovers receive larger bank loans than new venture start-ups. Business takeovers are more costly than new venture start-ups (Bastié et al., 2013; Parker and Van Praag, 2012). Existing firms have physical assets such as land, production equipment, and distribution channels in addition to intangible assets such as brand reputation and networks with suppliers and customers. As a result, the cost for purchasing an existing firm is likely to transcend the cost of creating a new firm (Bastié et al., 2013; Parker and Van Praag, 2012).

In light of the differences between new venture start-ups and business takeovers, recent studies have started to separate business acquirers from new venture creators to analyze the determinants that influence an individual's entry mode choices (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015). Former studies reveal a relationship between entrepreneurship path and human capital (Parker and Van Praag, 2012), social and financial capital (Bastié et al., 2013), individual- and country-level characteristics (Block et al., 2013b), and an entrepreneur's gender (Kay and Schlömer-Laufen, 2016). Yet, an in-

² European Commission. (2006). Final report 117: Transfer of businesses – continuity through a new beginning. Retrieved from <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52006DC0117> on July 11th, 2017. It is noted that here business transfer includes not only outsider business takeovers but also family firm ownership transfer.

depth investigation into the impact of work experience on entry mode choice is still missing. In light of this research void, this dissertation proposes the following question:

RQ 1: *How does an individual's work experience (e.g., small firm experience, management experience, and same sector experience) affect one's entry mode choice between new venture start-up and business takeover?*

In the limited studies on entrepreneurship entry mode choice, academic scholars analyze entrepreneurial behavior with samples of entrepreneurs who work exclusively on their entrepreneurial projects, namely full-time entrepreneurs. However, recent research has found that a certain number of entrepreneurs do not devote all of their efforts to their new ventures. Instead, they spend part of their time on the new business and use the remainder of their time to work as an employee in other firms (e.g., Folta et al., 2010; Petrova, 2012; Raffiee and Feng, 2014; Schulz et al., 2016; Thorgren et al., 2016; Van Gelderen, et al., 2006; Wennberg et al., 2006). This type of entrepreneur is referred to as a “hybrid entrepreneur” by Folta et al. (2010). In this dissertation, hybrid entrepreneurs are defined as individuals who start a new firm or acquire an existing firm while concurrently keeping their position in paid employment.

The dual nature of hybrid entrepreneurship determines that hybrid entrepreneurs and full-time entrepreneurs have distinguished characteristics and motivations. They differ in terms of entrepreneurial motivation (Burmeister-lamp et al., 2012), time commitment (Burmeister-lamp et al., 2012; Lévesque and Schade, 2005; Petrova, 2012), and risk attitude (Lévesque and Schade, 2005; Raffiee and Feng, 2014). By showing that full-time entrepreneurs who had previously been hybrid entrepreneurs maintain firms longer than those without such experience, Raffiee and Feng (2014) conclude that hybrid entrepreneurship is a learning process that is closely related to firm performance enhancement.

In spite of the differences between hybrid and full-time entrepreneurs, little is known about how hybrid entrepreneurs choose their entry modes across new venture start-up and business takeover. In this regard, this dissertation aims at answering the following question:

RQ 2: *What individual- (e.g., educational attainment) and/or firm-level characteristics (e.g., financial capital) determine a hybrid entrepreneur's entry mode choice between new venture start-up and business takeover?*

1.2.2 Business succession: firm survival and family firm succession (Chapter 5-6)

New venture start-ups and business takeovers aim at enhancing firm performance and prolonging life expectancy. Therefore, to understand the survival determinants of new firms is of great interest and importance not only for entrepreneurs, but also for scholars and policy makers. In the work of Brüderl et al. (1992), a framework that includes: entrepreneur, firm, and industry is proposed to explain the mortality rate of newly created ventures. At the individual level, the founder's work experience has been shown to be a significant determinant of firm survival (e.g., Bosma et al., 2004; Boyer and Blazy, 2014; Brüderl et al., 1992; Cooper et al., 1994; Elfenbein et al., 2010). Whereas at the firm level, larger start-up capital leads to a higher survival rate for newly created firms (e.g., Bates, 1990; Duchesneau and Gartner, 1990).

Individuals can choose between a new venture start-up path and business takeover path to become an entrepreneur. Unlike most survival analyzes that concentrate only on the survival chances of newly created firms, Bates (1990) and Dyke et al. (1992) show that business takeovers have a higher survival rate than new venture start-ups. This finding can be explained by the scale advantage of takeovers as well as the liability of newness for new venture start-ups (Aldrich and Auster, 1986; Dyke et al., 1992). On one hand, acquired firms already have skillful employees and customer bases, which help the firm last longer in the market (Dyke et al., 1992). On the other hand, new venture start-ups need to develop all components of the business, including product design, employee recruitment, and product marketing, which might lead to a higher risk of failure (Bates, 1990).

This dissertation relies on existing literature of firm survival, while extending survival analysis of different entrepreneurship paths by incorporating business takeover as another path to entrepreneurship in addition to new venture start-up. In particular, this study concentrates on entrepreneurship survival determinants at the individual level, namely the entrepreneur's experience and attributes, as well as at the firm level, namely the firm's characteristics. This study then compares the survival determinants for new venture start-ups and business takeovers. The following research questions are thus formulated:

RQ 3.1: *How do firm survival rates differ between business takeovers and new venture start-ups?*

RQ 3.2: *How do survival determinants differ between new venture start-ups and takeovers?*

New firms that successfully persist until their creators or acquirers retire need successors to take over the business. If the firm is controlled by either the entrepreneur or his or her family, and the entrepreneur or the family is willing to pass the firm down to the next generation,³ the firm is defined as a family firm (Chua et al., 1999; Klein et al., 2005). In family firms, the question of who should be hired as the new CEO after the founder steps down remains unsettled. Family firms have to weigh the trade-off between a family member and a professional manager. Family members have the inborn advantage as a result of trusting relationships with their family, built upon family values, ties, and common goals (Chrisman et al., 2012). According to agency theory (Jensen and Meckling, 1976), hiring a family manager reduces the cost for the family because the family (principal) and the family manager (agent) share the same objective for the family firm, thereby leading to a more effective and cost-saving decision making process that benefits the firm's long-term development (Chrisman et al., 2004; Davis et al., 1997; Schulze et al., 2003). However, nonfamily managers have arguably greater management skills, since they are chosen from a group of professional managers with a track record of achievement mainly reflected by a former employer's financial performance (Burkart et al., 2003; Dyer, 1989).

Moreover, the choice to hire a family manager or nonfamily manager can be affected by the relationship between the firm's economic goals and the family's non-economic goals. Economic goals, referred to as a firm's accounting performance, and non-economic goals, reflected by family reputation and harmony, can be complementary or substitutable (Chrisman et al., 2012; Chrisman et al., 2005; Martin and Gómez-Mejía, 2016; Zellweger and Astrachan, 2008). To reflect the impact of the relationship between these two types of goals on family firm's hiring decision, this dissertation implements the multitask principal-agent model proposed by Holmström and Milgrom (1991) in the context of family firms. The following research question is proposed:

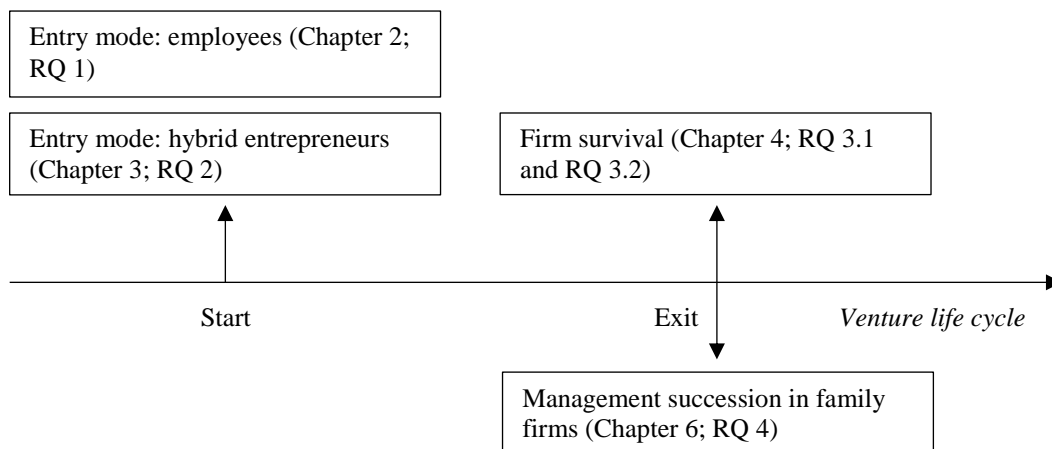
³ Here the transfer of the firm means ownership transfer.

RQ 4: *How does a family firm's decision between hiring a family manager or a nonfamily manager depend on task interdependence between economic goals and non-economic goals, measurement of the non-economic goals, and the managers' ability to pursue the family firm's goals?*

1.3 Structure of the dissertation

This dissertation consists of seven chapters. Chapter 2 and Chapter 3 analyze the impact of entrepreneur and firm characteristics on entrepreneurship entry modes across new venture start-up and business takeover. While Chapter 2 focuses on entrepreneurs' work experience, Chapter 3 concentrates on a sample of hybrid entrepreneurs and the impact of their characteristics on selecting an entrepreneurship path. Chapter 4 compares the survival chances for new venture start-ups and for business takeovers as well as their survival determinants. Chapter 5 summarizes previous studies concerning family firm definition, firm goals, and the selection of management successors. Chapter 6 uses a multitask principal-agent model to examine family firm's decision to choose a family or nonfamily manager. Chapter 7 concludes with a summary of findings and provides implications for practice. Figure 1-2 illustrates the main chapters of this dissertation.

Figure 1-2: Structure of the dissertation



Source: Own illustration.

Chapter 2 investigates the relationship between different types of work experience from prior paid employment and the path to entrepreneurship distinguished by new venture creation and

business takeover. More specifically, this chapter focuses on three types of work experience: small firm experience, management experience, and same sector experience. Before creating a hypothesis, this chapter provides an integrative literature review regarding entrepreneurship paths and their determinants. The effects of management experience and sector experience on mode of entry into entrepreneurship have been examined by Bastié et al. (2013) and Parker and Van Praag (2012); yet, the impact of small firm experience remains unknown. Drawn from the literature, this chapter forms three hypotheses regarding the effects of small firm experience, management experience, and same sector experience. Using a large-scale French data set, this chapter explores RQ 1 proposed in Section 1.2. A Heckman probit model is implemented to eliminate selection bias.

Chapter 3 focuses on a sample of hybrid entrepreneurs, who are defined as individuals who enter into entrepreneurship while concurrently keeping their paid job (Folta et al., 2010). This chapter starts with a comprehensive literature review on hybrid entrepreneurship with respect to its definition, entrepreneurial motivation, and entry determinants. In line with Chapter 2, this chapter also studies an individual's mode of entry into entrepreneurship, but goes on to examine a set of individual- and firm-level factors, including entrepreneurs' work and life experience, motivation, and socio-demographic factors, as well as the firm's financial status. Using the same data set as used in Chapter 2, this chapter responds to RQ 2 in Section 1.2.

Chapter 4 analyzes the survival chances of new venture start-ups and business takeovers. Although new venture survival has been widely discussed in academics, most studies target newly created firms while ignoring acquired firms whose new owners enter into entrepreneurship through purchasing existing firms (e.g., Bosma et al., 2004; Boyer and Blazy, 2014; Brüderl et al., 1992; Elfenbein et al., 2010). This chapter uses a sample of new venture start-ups and business takeovers to investigate the differences of these two paths to entrepreneurship. In order to construct two comparable samples, propensity score matching is used to select two matched samples that are similar to each other. With these two matched samples, a Cox proportional hazards model is used to analyze the hazard rates for new venture start-ups and business takeovers, respectively. Finally, a Chow test is conducted to compare the survival determinants between these two paths to entrepreneurship.

Chapter 5 summarizes three streams of family firm literature that are relevant to the analysis in Chapter 6. Before analyzing management selection dilemma in family firms, this chapter presents a summary of discussion regarding family firm definition, and highlights the difficulties

of defining family firm both in academic research and in practice. The second stream of literature concerns family firm goals, which can be disentangled into the firm's economic goals and the family's non-economic goals (Chrisman et al., 2012). Finally, this chapter compares the benefits and limitations of hiring family managers versus hiring nonfamily managers.

Chapter 6 implements a multitask principal-agent model proposed by Holmström and Milgrom (1991) in the context of family business. In this model, a family firm owner chooses a new manager between a family member and a nonfamily outsider to fulfill the firm's economic goals and the family's non-economic goals. Each manager has two tasks that correspond to the firm's two goals, and these two tasks can be either substitutes or complements. In light of Baker (1992, 2002), this model assumes that the manager's effort in the non-economic task cannot be perfectly contracted and incentivized. This chapter then analyzes the impact of relative abilities between a family and a nonfamily manager and the quality of performance measure on the family firm's decision to hire one or the other. Moreover, this chapter examines the effect of task interdependence, i.e., whether the two tasks are substitutes or complements on the family firm's hiring decision.

Chapter 7 concludes with a summary of the main findings of this dissertation, which answers research questions proposed in Section 1.2. Finally, this chapter provides practical implications for entrepreneurs, family firm owners, family managers, and nonfamily managers.

2 Work experience from paid employment and the path to entrepreneurship⁴

2.1 Introduction

There are several ways to become an entrepreneur; a well-known distinction is that between starting a new venture and taking over an existing business. Due to uncertainties related to newness and smallness, the new venture path is more risky than business takeover (Block, et al., 2013b; Parker and Van Praag, 2012). The latter, however, requires more financial capital (Bastié et al., 2013). Prior research shows that several individual and country-specific characteristics influence the business takeover versus new venture decision (Bastié et al., 2013; Block, et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015). So far, however, we know little how the type of work experience from one's previous paid employment influences the path to entrepreneurship. This study aims at filling this important research gap and focuses on three types of work experience, namely small firm experience, management experience, and same sector experience. Knowledge about how work experience from prior paid employment influences entrepreneurship entry modes and business transfer is important to understand individual's career paths and their determinants (Rauch and Rijdsijk, 2013). Moreover, it helps policymakers and small firm owners to understand and predict inefficiencies in the business transfer process.

Using a rich French firm-level data set including 29,489 firms that were either started as new ventures or were taken over, this study finds that small firm experience from previous paid employment increases the likelihood for business takeovers, whereas management and same sector experience both increase the likelihood for new ventures.

With these findings, this chapter contributes to the literature about the determinants of the path to entrepreneurship (Bastié et al., 2013; Block, et al., 2013b; Cooper and Dunkelberg, 1986; Fujii and Hawley, 1991; Parker and Van Praag, 2012). This study is among the first to study how the type of work experience from previous paid employment influences whether new venture start-up or business takeover is preferred as entrepreneurship entry mode. Also, this study contributes to

⁴ This chapter is partially based on a working paper which is cooperated with Jörn Block (Universität Trier), Frank Lasch (Montpellier Business School), Frank Robert (Montpellier Business School) and Roy Thurik (Erasmus University Rotterdam). The working paper is in the second-round review process of the academic journal *Revue de l'Entrepreneuriat*, and it was presented by me at the G-Forum conference in Leipzig on October 7th, 2016.

research on how small firm experience influences entrepreneurship. Prior studies about the *small firm effect* have shown that small firm experience is positively linked to entrepreneurial choice and performance (Elfenbein et al., 2010; Gompers et al., 2005; Parker, 2009). However, to date, this literature does not distinguish between different modes of entry into entrepreneurship. This study makes this distinction by analyzing whether small firm employees favor the business takeover or the new venture path. Finally, this study contributes to the literature about how management and leadership experience influence entrepreneurship (Boyer and Blazy, 2014; Colombo and Grilli, 2005; Ganotakis, 2012; Rauch and Rijdsdijk, 2013). Contrary to what this study has hypothesized, management experience favors new venture start-ups and not business takeovers. This study explains this surprising finding by arguing that individuals with management experience probably care about the non-financial aspects of entrepreneurship which are typically more prominent for new venture start-ups than for business takeovers.

The finding that small firm experience leads to business takeover has practical implications for policymakers and small firm owners. Policymakers aiming to improve the business transfer process and firm owners looking for outside successors should target their efforts towards employees from small firms. The results of this study indicate that such employees have a higher interest than other employees in taking over established firms rather than starting new ventures. Another practical implication concerns the finding that management and same sector experience reduce the likelihood for business takeover versus new venture start-up. Firms seeking outside successors may have a particularly big problem finding successors with relevant industry and management experience, which can put the jobs in these firms at stake. Prior research shows that both management and same sector experience are important drivers of firm survival and firm development (Boyer and Blazy, 2014; Colombo and Grilli, 2005; Ganotakis, 2012; Gimeno et al., 1997; Lasch et al., 2005; Rauch and Rijdsdijk, 2013).

2.2 Literature review and hypotheses

2.2.1 Literature about the path to entrepreneurship

Cooper and Dunkelberg's (1986) pioneer research about the path to entrepreneurship distinguishes between four modes of entry into entrepreneurship: starting a new firm, inheriting a (family) firm, acquiring an outside firm (e.g., through a management buy-in), and acquiring one's former employer (e.g., through a management or employee buyout). Because management buyout

and family firm takeover are limited to insider employees and family members, respectively, this study focuses on the two most common entrepreneurship entry modes: starting a firm and purchasing an existing firm.

New venture start-ups differ from takeover firms with respect to risk of failure and initial financial capital. First, business takeovers are less risky than new venture start-ups (Bastié et al., 2013; Block et al., 2013b; Parker and Van Praag, 2012). New entrants in the market face entry barrier, competition, and regulatory rules; in particular, market uncertainties may jeopardize the survival of newly created firms and force them to drop out (Bates, 1990). Parker and Van Praag (2012) show that new venture start-ups have a higher standard deviation of revenue than business takeovers, substantiating that the former are more volatile than the latter. In this regard, business takeovers are more attractive to investors and banks than are new venture start-ups, and receive larger loans from the bank (Bastié et al., 2013). Bastié et al. (2013) argue that business takeovers face less credit constraint because an existing business has a contractible credit history and a record of operation, which make them more reliable and trustworthy than newly founded firms. Second, business takeovers are on average more costly than new venture start-ups, as is shown by Parker and Van Praag (2012), who find that the former have a higher industry entry cost than the latter. The cost of purchasing an existing firm not only covers its assets and establishments, such as production lines and distribution channels, but also includes its stakeholder networks with suppliers and customers that are accumulated through previous operations and will facilitate the further development of the acquired firms (Bastié et al., 2013).

The comparison of business takeovers and new venture start-ups has provided some insights for studying the determinants of entrepreneurship entry mode choices. Following the seminal work of Cooper and Dunkelberg (1986), four empirical studies have examined the factors influencing an entrepreneur's selection of entry mode (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012), and a summary of these four papers is presented in Table 2-1. Using a sample of 605 Dutch entrepreneurs, Parker and Van Praag (2012) investigate how formal and informal human capital affect someone's entrepreneurship entry mode. Formal human capital is acquired through education and work experience. Informal human capital is gained through working in family business. The authors show that individuals with higher levels of education are more likely to choose new venture start-up, whereas individuals with management experience and family-business background prefer business takeover as an entry mode.

The study of Bastié et al. (2013), however, focuses on the impact of entrepreneurs' social capital on their modes of entry into entrepreneurship. The authors explain the finding of a positive association between entrepreneurial and professional network and new venture start-up entry mode by referring to the role model effect embedded in social networks. That is, entrepreneurial spirit can be transferred within an individual's social network, and will motivate the person to choose the more entrepreneurial path, namely starting a new firm from scratch.

Unlike Parker and Van Praag (2012) and Bastié et al. (2013) who investigate the *actual* entrepreneurship entry mode, Block et al. (2013b) study the *preferred* mode of entry between business takeover and new venture start-up. In their study, a set of individual- and country-level characteristics is examined using a cross-country sample of 4,210 people from 33 countries; it is the only study that considers country-level effects in the related literature. The authors find that in countries with a higher innovation level, greater administrative burden, and easier access to bank loans, individuals prefer business takeover to new venture start-up. In contrast, in countries with a higher risk tolerance level, individuals are more likely to opt for new venture start-up.

A recent paper by Kay and Schlömer-Laufen (2016) focuses on the mediation effect of human capital on the relationship between gender and entrepreneurship entry mode. They find that women are more entrepreneurial than previously assumed, as they are more *intended* to start a new firm from scratch rather than taking over an existing firm. This gender effect is attributed to gender-related differences in entrepreneurs' resources and capabilities, such as specific human capital qualifications, time availability, and having a business idea. However, with respect to *actual* mode of entry, the gender effect on entrepreneurship entry mode is insignificant. The authors conclude that in order to motivate and persuade women to choose business takeover as a preferred and actual mode of entry into entrepreneurship, more fundamental societal changes regarding labor division between men and women and vocational choice are needed.

Table 2-1: A summary of the four papers regarding entrepreneurship entry mode

	Bastié et al. (2013)	Parker and Van Praag (2012)	Block et al. (2013b)	Kay and Schlömer-Laufen (2016) ^a
<i>Human capital</i>				
Educational attainment	-	-	-	
Management experience	+	+		
Same sector experience	-			
Master craftsman's diploma				+
Business idea				+/ns
Full-time self-employment plan				+
<i>Social network</i>				
Entrepreneurial network	-	+	+	
Professional network	-			
<i>Socio-demographic status</i>				
Age		+/ns	+	-/ns
Female	-	-/ns	-/ns	-/ns
Citizenship	-			
<i>Psychological characteristics</i>				
Risk-taking propensity			-	
Inventiveness			-	
<i>Financial status</i>				
Founding capital	+	+		
Cash flow problem	-			
Business plan	-			
<i>Country-level characteristics</i>				
Number of patents			+	
Starting a business (time needed)			+	
Availability of bank loans			+	
Risk tolerance			-	
Number of entrepreneurs	20,374	605	4,210	735

Notes: ^a The results refer to *actual* mode of entry an entrepreneur has chosen.

The dependent variable equals one if the entrepreneur takes over an existing firm; zero if the entrepreneur starts a new venture. "Ns" stands for "not significant".

2.2.2 Hypotheses about how work experience influences entrepreneurship entry mode

This study develops three hypotheses on how work experience from prior paid employment influences entrepreneurship entry mode distinguishing between business takeovers versus new venture start-ups. These hypotheses focus on the effects of small firm experience, management experience, and same sector experience.

Small firm experience and entrepreneurship entry mode

Small firms are more likely than large firms to generate entrepreneurs (Elfenbein et al., 2010; Gompers et al., 2005; Kacperczyk and Marx, 2016; Sørensen, 2007). Large firms tend to be hierarchical and bureaucratic (Sørensen, 2007). Employees may have felt frustrated that their former (large) employer neglected their innovative ideas. A well-documented example is Xerox; many former employees have founded small independent firms because Xerox rejected their innovative projects (Audretsch, 2007). In moving from paid employment to entrepreneurship, employees seek to realize their own innovative ideas and become their own boss, giving them the possibility to create and shape their own organization and work environment (Van Gelderen and Jansen, 2006). In line with Block et al. (2013b), this study posits that the potential for innovation and the possibility to create one's own organization and work environment is greater in a new venture than in a business takeover. Small firm employees, on the other hand, do not feel this frustration and do not need to start an own business to realize their own ideas. Small firm employees are also in a good position to build a strong network with suppliers, customers, and even competitors, promoting the likelihood of business takeover. This study shall argue that they are more adept and are in a better position at spotting potential high growth firms that are seeking outside successors, in particular micro and other small firms. Summarizing these two lines of arguments, this study proposes the following hypothesis:

***H2-1:** Small firm experience is positively associated with business takeovers versus new venture start-ups.*

Management experience and entrepreneurship entry mode

Working in a management position requires management skills such as communication, leadership, planning, and problem-solving skills. Takeover firms which are usually of larger scale than new venture start-ups, require successors who can manage its employees and develop the business. Business takeovers have more complicated governance structures, larger numbers of employees and greater transaction and sales amounts than new venture start-ups. The ability of managing teams, processes, and customer relationships is of great value. In short, this study argues that management experience is more valuable in business takeovers than in new venture start-ups (Parker and Van Praag, 2012). In contrast, according to Lazear's (2005) jack-of-all-trades view of entrepreneurs, new venture start-up founders have more generic forms of human capital accumulated through multifaceted work experience, but they are less likely to be exceptional in a certain field. In line with Bastié et al. (2013) and Parker and Van Praag (2012), this study thus hypothesizes a positive relationship between management experience and business takeover.

***H2-2:** Management experience is positively associated with business takeovers versus new venture start-ups.*

Same sector experience and entrepreneurship entry mode

Industry-specific knowledge and industry know-how are typically difficult to transfer across sectors. This constitutes a market entry barrier and encourages employees to stay in the same sector. Employees with significant work experience in a particular sector often have a deep understanding of the market, the competitors, the products, and the customers' needs (Boyer and Blazy, 2014). Often, they have also established close business and social networks with colleagues, customers, and suppliers. These networks together with deep industry knowledge are helpful to identify and exploit attractive entrepreneurial opportunities (Ganotakis, 2012). The path to entrepreneurship of sector experienced employees presents new venture start-up as the better option to exploit new ideas and opportunities. On the other hand, employees from other sectors are in an outsider position and do not have this profound sector-specific knowledge and intense networks which makes it more difficult to start one's own business. They have to rely more on established business structures and existing customers to become an entrepreneur in that sector, favoring busi-

ness takeover over new venture start-up. This argument is in line with strategic management research about firm's market entry behaviors. Firms that do not have the knowledge and resources to enter a new market favor acquisitions over greenfield investments as market modes of entry (Helfat and Lieberman, 2002). The following hypothesis is proposed:

H2-3: Same sector experience is negatively associated with business takeovers versus new venture start-ups.

2.3 Data set and variables

This study uses a data set called SINE (*Système d'Information sur les Nouvelles Entreprises*). The data was collected in a survey by the French institute INSEE (*Institut National de la Statistique et des Etudes Economiques*) in September 2002. INSEE is a government agency that is in charge of collecting, administering and publishing statistics in various domains such as economy, businesses, new firms, labor and employment, demography, etc. The scope of the survey covers the sectors of manufacturing, construction, trade and repair, and other service sectors. Since the survey was official and mandatory for all new venture start-ups and business takeovers in these sectors in France, the response rate is very high (92,966 out of 100,731 firms contacted), assuring that the dataset is a good representation of the population of new venture start-ups and business takeovers in France.

This study restricts the sample to new ventures founded by or taken over by former paid employees as its research interest lies in the work experience from paid employment and how it affects entrepreneurship. Hence, former self-employed individuals, students, homemakers, retirees and long-term unemployed individuals are excluded (39,567 individuals in total).⁵ Finally, it also excludes 11,284 part-time entrepreneurs who have a job in paid employment while entering into entrepreneurship. Previous studies have pointed out the differences between full-time and part-time entrepreneurs in terms of time commitment, risk bearing, motivation, and performance (Lévesque and Schade, 2005; Burmeister-Lamp et al., 2012; Petrova, 2012; Raffiee and Feng, 2014). Moreover, by focusing on full-time entrepreneurs, the results of this study can be compared to former

⁵ This study keeps, however, short-time unemployed individuals with work experience in the sample. Such individuals may have quitted their job in paid employment with the intention to become entrepreneurs.

studies regarding entrepreneurship entry mode (Bastié et al., 2013; Block et al., 2013b; Parker and Van Praag, 2012).

The SINE data set includes three types of business takeovers: family firm takeovers, management buyouts, and outside takeovers. In line with prior research (Bastié et al., 2013; Parker and Van Praag, 2012), this study excludes 531 family firm takeovers and 803 management buyouts from the analysis, as these two types of takeovers constitute special cases that are not available for nonfamily members or external employees, respectively. Furthermore, this study identifies and excludes one new venture start-up with more than 200 employees as an outlier. Also, observations with missing values are excluded. The final sample consists of 29,489 full-time entrepreneurs (26,012 started a new venture, and 3,477 took over an existing business).

This study uses two regression models to analyze the effect of work experience on entrepreneurship entry mode. The first regression model is a Heckman probit model accounting for a potential selection bias that may occur as a result of restricting the sample to entrepreneurs with prior work experience from a full-time wage job (Heckman, 1979). In the first stage of this model (the selection regression), the dependent variable equals one if the individual chose to work prior to entrepreneurship. In the second stage of this model (the outcome regression), the dependent variable *business takeover* equals one if the individual chose business takeover as entrepreneurship entry mode, and zero if new venture start-up. Another regression model used in this study is a simple logistic regression using the reduced sample of entrepreneurs with prior work experience from paid employment. The dependent variable is the same as the one in the outcome regression of the Heckman model.

The focal independent variables in this study concern the entrepreneur's previous work experience during paid employment. This study distinguishes between three types of experience regarding firm size: *small firm* (less than 49 employees), *medium firm* (50 to 249 employees), and *large firm experience* (more than 250 employees). The variable *management experience* measures whether the entrepreneur has worked as a CEO or a senior manager. The variable *same sector experience* equals one if the entrepreneur has worked in the same sector, zero if in a different sector.

Furthermore, based on previous literature regarding entrepreneurship entry modes (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015), this study adds several individual-level control variables, such as *educational level*, *entrepreneurial training*, *entrepreneurs in close relational circle*, *received social benefit*,

growth ambition, long-term entrepreneurship, age, nationality, motivation, and sole partnership. Additionally, this analysis controls for firm-level characteristics such as the *innovation level and type* of the firm, the amount of *start-up capital, received public aid*, and the *percentage of self-funding*. This study also includes eight industry and 25 region dummies as controls. All variables are defined in Table A2-1 (Appendix).

2.4 Results

About 88% of the entrepreneurs in the sample started a new venture; 12% chose business takeover. Table 2-2 compares entrepreneurs who started a new venture with entrepreneurs who chose business takeover as entry mode. This study finds that *small firm experience* is higher for entrepreneurs who chose business takeover than for entrepreneurs who started a new venture, whereas *same sector experience* is higher for new ventures than for business takeovers. The proportion of entrepreneurs with *management experience* is also higher for new ventures than for business takeovers.

Table A2-2 (Appendix) shows a correlation table and reports variance inflation factors (VIFs). The correlations between the independent variables are low and the VIFs fall within an acceptable range; hence multicollinearity is unlikely to be a concern, particularly since the sample is very large. Table 2-3 shows the outcome regression results of the Heckman probit model and the logistic regression results with *business takeover* as the dependent variable. The two models yield similar results. The LR test of the Heckman model is insignificant ($p=0.153$), indicating that the unobserved factors influencing the likelihood of having work experience prior to entrepreneurship is not related to the likelihood of choosing business takeover. This study does not find evidence for a selection bias.

With respect to the main independent variables, results show that the firm size of the former employer has an effect on entrepreneurship entry mode. Compared to paid employees from small firms, employees from medium-sized firms (model I, *medium firm experience*: $\beta=-0.11$, $p<0.05$) are more likely to choose new venture start-up versus business takeover. The negative effect of large firm experience is significant in the logistic regression, but insignificant in the Heckman model. Hypothesis 2-1 is supported. In line with Bastié et al. (2013), this study finds evidence supporting Hypothesis 2-3: entrepreneurs with *same sector experience* are more likely to have entered entrepreneurship via new venture start-up versus business takeover (model I, $\beta=-0.18$,

$p < 0.001$). Surprisingly, *management experience* is positively related to new venture start-up (model I, $\beta = -0.25$, $p < 0.001$). This finding differs from the results of Bastié et al. (2013) and Parker and Van Praag (2012). H2-2 is rejected.

Regarding individual-level control variables, entrepreneurs with *higher education* are more likely to start a new venture, which corresponds to the results of Bastié et al. (2013), Block et al. (2013b), and Parker and Van Praag (2012). Furthermore, *entrepreneurial training*, *having entrepreneurs in a close relational circle*, *having received social benefit*, *long-term entrepreneurship*, and *sole entrepreneur* have positive associations with new venture start-ups. *Growth ambition*, however, relates positively to business takeover as entry mode. This study does not find significant effects regarding *age* or *nationality*. The estimates of the motivation variables suggest that motivational factors and non-financial motives influence entrepreneurship entry modes, which is in line with the results of Block et al. (2013b). With respect to firm level variables, *product innovation* has a positive association with new venture start-up. Also, the amount of *start-up capital* is positively associated with business takeover, which is in line with the results of Bastié et al. (2013). Moreover, the regressions confirm the findings from the univariate analysis that new ventures are more likely to have received *public aid* and have a higher *percentage of self-funding* than business takeovers.

This study performs several robustness checks, of which the two most important are available in Table 2-4. In the first robustness check, 8,550 part-time entrepreneurs are included in the analysis sample; in the second robustness check, small firms (less than 49 employees) are subdivided into micro firms (less than 10 employees) and small firms (10-49 employees). Both robustness checks confirm the main findings regarding management and same sector experience. With reference to small firm experience, robustness check I shows insignificant estimates, which may be caused by the differences between full- and part-time entrepreneurs and their motivations to become entrepreneurs.

Table 2-2: Descriptive statistics

	New venture start-up	Business take- over	t-values ^a of tests of mean differences
	Mean	Mean	
<i>Type of work experience from previous paid employment</i>			
Small firm experience	0.73	0.79	-9.22***
Medium firm experience	0.11	0.08	5.88***
Large firm experience	0.16	0.12	6.37***
Management experience	0.24	0.16	11.89***
Same sector experience	0.68	0.61	8.56***
<i>Further characteristics of the entrepreneur</i>			
No diploma	0.14	0.13	2.14*
Lower than A-level diploma	0.38	0.48	-11.08***
A-level diploma	0.17	0.19	-2.55*
A-level plus two years education	0.12	0.10	4.09***
A-level plus over two years education	0.19	0.11	14.28***
Received entrepreneurial training	0.40	0.38	2.57*
Entrepreneurs in close relational circle	0.68	0.67	1.61
Received social benefit	0.08	0.04	9.08***
Growth ambition	0.44	0.56	-13.51***
Long-term entrepreneurship	0.91	0.93	-3.81***
Age under 35	0.41	0.47	-6.65***
Age between 35 and 49	0.47	0.46	0.90
Age over 50	0.12	0.07	10.84***
Female	0.21	0.34	-14.72***
French	0.89	0.93	-9.94***
Motivation: new idea of product or marketing	0.19	0.09	18.37***
Motivation: independent	0.81	0.84	-5.91***
Motivation: a sense of entrepreneurship	0.61	0.65	-5.29***
Motivation: opportunity	0.33	0.55	-24.55***
Motivation: entrepreneurs in entourage	0.20	0.19	1.80
Motivation: unemployed and chose entrepreneurship	0.25	0.12	20.28***
Motivation: unemployed and constraint	0.05	0.02	11.91***
Motivation: other reasons	0.15	0.15	0.19
Sole entrepreneur	0.55	0.32	26.73***
<i>Firm-level variables</i>			
No innovation	0.60	0.50	11.04***
Product innovation	0.21	0.23	-3.04**
Process innovation	0.08	0.08	0.04
Organizational innovation	0.14	0.25	-13.97***
Start-up capital: <2k	0.19	0.02	51.20***
Start-up capital: 2-16k	0.56	0.20	48.23***
Start-up capital: 16-80k	0.20	0.40	-23.28***
Start-up capital: >80k	0.05	0.38	-39.83***
Received public aid	0.36	0.30	8.23***
Percentage of self-funding	0.57	0.28	52.34***
N entrepreneurs	26,012	3,477	

Notes: ^a Welch's t-test. Significance level: * p<0.05, ** p<0.01, *** p<0.001.

Table 2-3: Determinants of entry mode for former paid employees

	Model I Heckman probit model	Model II Logistic regression
<i>Type of work experience from previous paid employment</i>		
Benchmark: small firm experience		
Medium firm experience	-0.11* (-2.24)	-0.20* (-2.17)
Large firm experience	-0.07 (-1.65)	-0.16* (-2.03)
Management experience	-0.25*** (-6.22)	-0.52*** (-6.72)
Same sector experience	-0.18*** (-6.06)	-0.34*** (-6.21)
<i>Control variables</i>		
<i>Individual-level variables</i>		
Benchmark: no diploma		
Lower than A-level diploma	0.02 (0.42)	0.05 (0.63)
A-level diploma	-0.15** (-2.91)	-0.27** (-2.90)
A-level plus two years education	-0.28*** (-4.36)	-0.46*** (-4.15)
A-level plus over two years education	-0.19** (-3.13)	-0.30** (-2.61)
Received entrepreneurial training	-0.16*** (-5.30)	-0.27*** (-4.79)
Entrepreneurs in close relational circle	-0.14*** (-4.49)	-0.25*** (-4.49)
Received social benefit	-0.13* (-2.22)	-0.27* (-2.30)
Growth ambition	0.06* (2.12)	0.12* (2.24)
Long-term entrepreneurship	-0.12* (-2.25)	-0.22* (-2.21)
Benchmark: age under 35		
Age between 35 and 49	0.02 (0.80)	0.03 (0.61)
Age over 50	-0.05 (-0.82)	-0.16 (-1.57)
French	-0.03 (-0.63)	-0.08 (-0.76)

Notes: Dependent variable: business takeover (dummy=1) versus new venture start-up (dummy=0). This is the outcome regression of the Heckman probit model. The selection regression is presented in Table A2-3. Industry and region dummies are included in the model. Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001; t-statistic in parentheses.

Table 2-3 (continued): Determinants of entry mode for former paid employees

	Model I Heckman probit model	Model II Logistic regression
<i>Control variables</i>		
<i>Individual-level variables</i>		
Motivation: new idea of product or marketing	-0.62*** (-14.04)	-1.23*** (-14.64)
Motivation: independent	0.09* (2.52)	0.23*** (3.29)
Motivation: a sense of entrepreneurship	-0.08* (-2.55)	-0.18** (-2.98)
Motivation: opportunity	0.25*** (8.18)	0.42*** (7.45)
Motivation: entrepreneurs in entourage	-0.02 (-0.39)	-0.00 (-0.02)
Motivation: unemployed and chose entrepreneurship	-0.28*** (-6.74)	-0.54*** (-6.84)
Motivation: unemployed and constraint	-0.29*** (-3.38)	-0.54** (-3.26)
Motivation: other reasons	-0.06 (-1.35)	-0.11 (-1.39)
Sole entrepreneur	-0.18*** (-6.50)	-0.33*** (-6.12)
<i>Firm-level variables</i>		
Benchmark: no innovation		
Product innovation	-0.08* (-2.29)	-0.18** (-2.77)
Process innovation	0.04 (0.68)	0.10 (1.00)
Organizational innovation	0.31*** (8.89)	0.62*** (9.41)
Benchmark: start-up capital: <2k		
Start-up capital: 2-16k	0.45*** (7.01)	1.09*** (7.86)
Start-up capital: 16-80k	1.12*** (17.15)	2.37*** (17.04)
Start-up capital: >80k	1.76*** (24.42)	3.47*** (23.63)
Received public aid	-0.28*** (-8.77)	-0.52*** (-8.79)
Percentage of self-funding	-0.56*** (-14.38)	-1.10*** (-14.60)
Constant	-1.83*** (-6.57)	-3.78*** (-7.78)
N entrepreneurs	29,489	29,489
Log likelihood	-40,311.03	-5,347.24

Notes: Dependent variable: business takeover (dummy=1) versus new venture start-up (dummy=0). This is the outcome regression of the Heckman probit model. The selection regression is presented in Table A2-3. Industry and region dummies are included in the model. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t-statistic in parentheses.

Table 2-4: Robustness checks

	Robustness check I (Part-time entrepreneurs are included in the sample)	Robustness check II (Micro firm: less than 10 employees; small firm: 10-49 employees)
<i>Type of work experience from previous paid employment</i>		
		Benchmark: micro firm experience
Small firm experience		-0.05 (-0.81)
	Benchmark: small firm experience	
Medium firm experience	-0.12 (-1.57)	-0.22* (-2.30)
Large firm experience	-0.14 (-1.94)	-0.18* (-2.18)
Management experience	-0.61*** (-9.49)	-0.52*** (-6.69)
Same sector experience	-0.19*** (-3.99)	-0.35*** (-6.26)
<i>Control variables</i>		
<i>Individual-level variables</i>		
		Benchmark: no diploma
Lower than A-level diploma	-0.05 (-0.69)	0.05 (0.64)
A-level diploma	-0.40*** (-4.87)	-0.27** (-2.91)
A-level plus two years education	-0.59*** (-6.13)	-0.45*** (-4.11)
A-level plus over two years education	-0.45*** (-4.64)	-0.30** (-2.63)
Received entrepreneurial training	-0.21*** (-4.19)	-0.27*** (-4.81)
Entrepreneurs in close relational circle	-0.28*** (-5.71)	-0.25*** (-4.49)
Received social benefit	-0.17 (-1.54)	-0.27* (-2.32)
Growth ambition	0.13** (2.62)	0.13* (2.28)
Long-term entrepreneurship	-0.14 (-1.69)	-0.22* (-2.21)
		Benchmark: age under 35
Age between 35 and 49	0.07 (1.48)	0.04 (0.64)
Age over 50	-0.19* (-2.23)	-0.16 (-1.56)
French	-0.17* (-1.99)	-0.08 (-0.74)

Notes: Industry and region dummies are included in both robustness checks. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t-statistic in parentheses.

Table 2-4 (continued): Robustness checks

	Robustness check I (Part-time entrepreneurs are in- cluded in the sample)	Robustness check II (Micro firm: less than 10 employ- ees; small firm: 10-49 employees)
<i>Control variables</i>		
<i>Individual-level variables</i>		
Motivation: new idea of product or marketing	-1.08*** (-15.52)	-1.23*** (-14.62)
Motivation: independent	0.33*** (5.60)	0.23*** (3.30)
Motivation: a sense of entrepreneurship	-0.17*** (-3.38)	-0.17** (-2.96)
Motivation: opportunity	0.47*** (9.33)	0.42*** (7.43)
Motivation: entrepreneurs in entourage	0.05 (0.74)	-0.00 (-0.02)
Motivation: unemployed and chose entrepreneurship	-0.35*** (-4.80)	-0.54*** (-6.83)
Motivation: unemployed and constraint	-0.56*** (-3.54)	-0.55** (-3.26)
Motivation: other reasons	-0.08 (-1.16)	-0.11 (-1.39)
Sole entrepreneur	-0.26*** (-5.49)	-0.33*** (-6.12)
<i>Firm-level variables</i>		
Benchmark: no innovation		
Product innovation	-0.20*** (-3.56)	-0.18** (-2.76)
Process innovation	0.10 (1.12)	0.10 (0.99)
Organizational innovation	0.54*** (9.31)	0.62*** (9.42)
Benchmark: start-up capital: <2k		
Start-up capital: 2-16k	1.04*** (8.79)	1.09*** (7.85)
Start-up capital: 16-80k	2.33*** (19.62)	2.37*** (17.02)
Start-up capital: >80k	3.23*** (25.83)	3.48*** (23.64)
Received public aid	-0.48*** (-8.66)	-0.52*** (-8.79)
Percentage of self-funding	-1.09*** (-16.52)	-1.10*** (-14.52)
Constant	-3.69*** (-8.76)	-3.77*** (-7.74)
N entrepreneurs	38,039	29,489
McFadden's pseudo R ²	0.465	0.500
Log likelihood	-6,833.48	-5,346.91

Notes: Industry and region dummies are included in both robustness checks. Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001; t-statistic in parentheses.

2.5 Discussion

2.5.1 Contribution to theory

This study shows that the type of work experience from previous paid employment influences the path to entrepreneurship and determines the entrepreneurship entry mode. This finding addresses the importance of distinguishing between new venture start-up and business takeover as two important and common entrepreneurship entry modes.

This study shows that the profiles of those individuals starting new ventures versus those taking over existing businesses differ significantly in terms of work experience, education, ambition, long-term orientation, motivation, partnership, and financial capital. In particular, small firm employees prefer to become entrepreneur via business takeover. In this perspective, this study connects the small literature regarding new venture start-up versus business takeover with the literature on how the type of work experience influences entrepreneurship entry mode (Elfenbein et al., 2010; Gompers et al., 2005; Parker, 2009). The small firm effect in this analysis can be explained by the employees' reasons for leaving their paid employment job to become entrepreneurs. For example, working in small firms offers employees higher entrepreneurial learning opportunities as compared to employees in large firms (O'Gorman et al., 2005). Consequently, small firm employees accumulate operational knowledge of 'how to run a business' and take the decision to take over a (small) business rather than to set up a new one. Also, small firm employees are likely to network with suppliers, customers and competitors (Elfenbein et al., 2010; Gompers et al., 2005). They may know of some small and micro firms that are looking for outside buyers, and may be better suited to use their networks to acquire such firms.

This study argues that the motivation to become an entrepreneur differs between paid employees from large versus small firms. Large firms are more hierarchical and bureaucratic than small firms (Sørensen, 2007), and they tend to focus on their core business (Hellmann, 2007). Large firm employees may leave their firms to start their own businesses when their innovative ideas are rejected by their former employer (Garvin, 1983). Because employees from large firms are often well paid and the opportunity costs are thus higher, this study argues that, particularly for employees from large firms, non-financial aspects of entrepreneurship must play an important role in the motivation to become an entrepreneur (Millán et al., 2013). The importance of non-financial motivations, however, also varies according to one's career stage and family situation (Jaouen and

Lasch, 2015; Jayawarna et al., 2011). The potential for innovation and the flexibility of shaping a new organization is greater in a new venture than in a business takeover. By starting a new business from scratch, entrepreneurs can shape the venture to be exactly as they envision it. This possibility exists to a lesser extent with business takeovers, where the organization is already in place, including its products, employees, suppliers, and customers.

The finding regarding same sector experience is in line with Bastié et al. (2013). This study argues that individuals with same sector experience have a more profound knowledge of the market and its products and customers and are therefore in a better position than outsiders to start a business from scratch. Moreover, they can make use of their professional networks to spot and develop attractive entrepreneurial opportunities. Those individuals that do not have same sector or relevant industry experience may prefer an entry into entrepreneurship via business takeover. In doing so, they can rely on the firm's established structures and customer relationships and that way of entering into entrepreneurship compensates for their lack of relevant industry or sector experience.

Finally, this study finds that management experience increases the likelihood for new venture start-ups, which is contradictory to what has been hypothesized and is contrary to what Bastié et al. (2013) and Parker and Van Praag (2012) have found. This finding is explained through the high importance of non-financial aspects of entrepreneurship for entrepreneurs with management experience. Individuals in senior management positions may leave their former employer when they are frustrated with the firm's poor management and unclear promotion paths (Cooper, 1971). This study argues that having management experience may encourage employees to start a new venture rather than taking over an existing business. The former enables them to apply their own management and governance philosophy and does not force them into existing structures.

2.5.2 Implications for practice

This study is relevant for policymakers and firm owners aiming to improve the business transfer process. Across the EU and many other countries, several proposals have been made and initiatives have been launched designed to improve the business transfer process, including a reduction of (inheritance) taxes, measures to help prepare those who want to sell their business, as well as training and financial support for those who want to take over an existing business (European Commission, 2012). The findings of this study suggest that the likelihood of taking over an

existing business is higher for small firm employees than for large firm employees. Hence, policy-makers and firms looking for an outside successor should pay attention to employees in small firms who (intend to) quit their jobs to become entrepreneurs. Moreover, this study justifies the provision of tailored entrepreneurship training programs for entrepreneurs seeking new venture start versus business takeover. The two groups of entrepreneurs differ in many aspects, notably work experience, education and the type of entrepreneurial motivation. Entrepreneurship training programs should account for these differences to prepare entrepreneurs in an effective way for the challenges they are confronted with as entrepreneurs. So far, most training courses offered by either policy-makers or business schools are for new venture starters. This study shall argue that there is a need for more programs instructing potential entrepreneurs on how to identify and develop business takeovers. The findings suggest that these need to be different from the ones offered to entrepreneurs starting their own ventures not only because the requirements are different but also because the target groups show different profiles. Finally, the findings that management and same sector experience reduce the likelihood for business takeover point to a potential problem of identifying successors with relevant industry and management experience. Yet, prior research shows that both management and same sector experience are crucial for firm survival and firm development (Boyer and Blazy, 2014; Colombo and Grilli, 2005; Ganotakis, 2012; Gimeno et al., 1997; Rauch and Rijsdijk, 2013).

2.6 Conclusion

The objective of this chapter is to understand how work experience gained from prior paid employment influences the path to entrepreneurship. This study focuses on specific types of work experience of employees, such as small firm, management, and same sector experience. Addressing a gap in the literature, this study distinguishes between and then compare two distinct entry modes to entrepreneurship: starting a new venture versus taking over an existing business. This study contributes to the literature about the determinants of the path to entrepreneurship and to the research on how small firm experience influences entrepreneurship. This study finds that small firm experience increases the likelihood for business takeovers, whereas management and same sector experience both increase the likelihood for new ventures. The first finding can be explained by higher facilities to identify firms seeking a successor in customer or supplier networks. Also, literature points to higher entrepreneurial learning in small firm contexts that enables employees to

understand how to run a business, facilitating *in fine* the takeover of a (small) business. The second finding contributes to the literature about how management and leadership experience influence entrepreneurship. Contrary to the expectation, management experience favors new venture start-ups and not business takeovers. This study justifies this finding by pointing at non-financial aspects of entrepreneurship which play a greater role in starting a firm from scratch versus business takeovers.

The findings of this study have several implications for policymakers and entrepreneurs. With a better understanding of specific work experience and its effect on entry choice, this study provides fresh insights for entrepreneurship support policies to foster new firm creation. In particular, policymakers aiming to improve the business transfer process could take into account the small firm effect for entrepreneurship entry choice to identify (small firm employees) and to train (industry and management experience) candidates for business takeover.

This analysis is not without limitations, from which avenues for further research can be identified. In particular, the type of work experience from paid employment investigated in this study could be extended to include experience from specific types of organizations, such as international firms or non-profit organizations. The number of years of general work experience may also play a role in explaining entrepreneurship entry mode (Fujii and Hawley, 1991). In addition, work experience can be categorized according to its specialized areas, such as marketing experience and R&D experience (Stuetzer et al., 2012). Another promising avenue of future research is to look at how a balanced set of skills and experiences (Åstebro and Thompson, 2011; Lazear, 2005) may affect the path to entrepreneurship.

3 Hybrid entrepreneurship entry mode: new venture start-up vs. business takeover⁶

3.1 Introduction

A substantial number of entrepreneurs do not start their venture with a full time commitment; instead, they retain jobs in wage employment during the venture's initial phase. In 2015, 16% of self-employed individuals in France reported to be concurrently employed in a wage job (23% in Germany and 35% in the Netherlands).⁷ This type of entrepreneurship is referred to as hybrid entrepreneurship (Folta et al., 2010) and has recently received growing interest in the entrepreneurship literature (e.g., Block and Landgraf, 2016; Folta et al., 2010; Petrova, 2012; Raffiee and Feng, 2014; Schulz et al., 2016; Wennberg et al., 2006). So far, however, we know little about the entry mode of hybrid entrepreneurs. This is surprising, as the entry mode decision and the path to entrepreneurship is a well-investigated topic within entrepreneurship research (e.g., Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha, et al., 2015). This exploratory study investigates the determinants of hybrid entrepreneurs' entry mode decisions distinguishing between business takeover and new venture start-up. Specifically, this study examines how an individual's work experience, educational attainment, socio-demographic status, motivation and received support, as well as firm characteristics affect the hybrid entrepreneur's entrepreneurship entry mode.

This analysis is based on the entry mode decisions of 9,032 French hybrid entrepreneurs, who either started a new firm (new venture start-up) or took over an existing firm (business takeover). The findings show that the entry mode of hybrid entrepreneurs is, amongst others, influenced by an individual's human capital. Educational attainment and management experience are linked to new venture start-up, whereas having worker experience is associated with business takeover. Moreover, business takeover is preferred by female and those having received social benefit.

⁶ This chapter is partially based on a working paper which is cooperated with Jörn Block (Universität Trier), Frank Lasch (Montpellier Business School), Frank Robert (Montpellier Business School) and Roy Thurik (Erasmus University Rotterdam).

⁷ European Commission: Labor Force Survey. Retrieved from <http://ec.europa.eu/eurostat/web/lfs/data/database> on July 4th, 2016. This study accounts for individuals who reported their first occupation as "employed" and their second occupation as "self-employed", and vice versa.

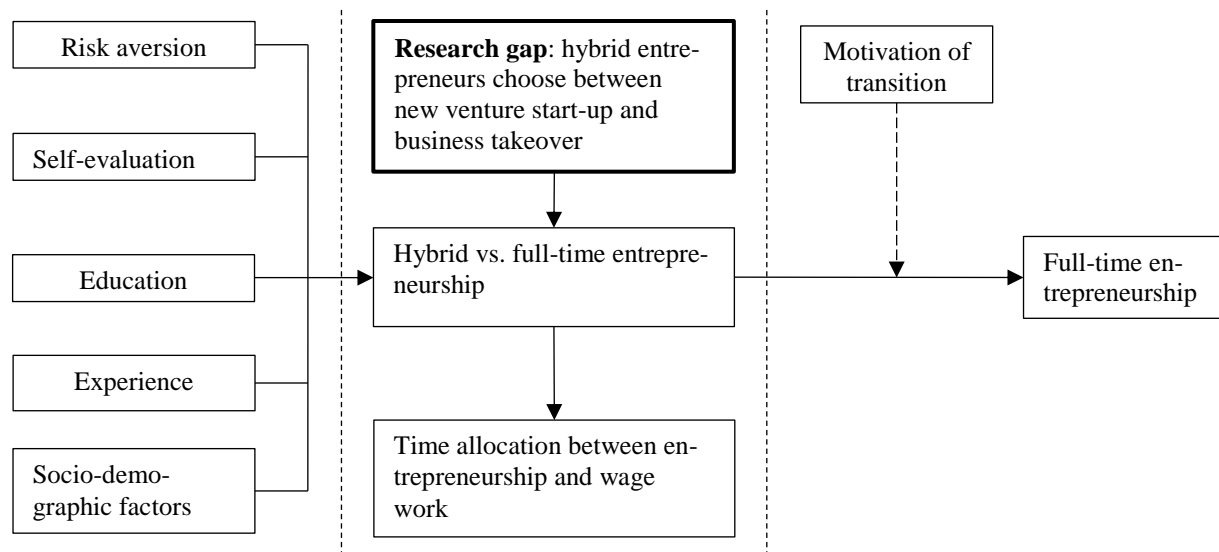
This study connects the literature on hybrid entrepreneurship to the literature on entrepreneurship entry modes. Previous studies on hybrid entrepreneurship focus on whether an individual enters entrepreneurship via a hybrid or full-time commitment status (Folta et al., 2010; Raffiee and Feng, 2014; Schulz et al., 2016). This chapter goes one step further and investigates the entrepreneurship entry mode of hybrid entrepreneurs, distinguishing between business takeover and new venture start-up. This study thus helps to understand the behavior of hybrid entrepreneurs with respect to entry mode decisions.

The findings of this study also has important policy implications. Policy-makers designing programs to promote business transfers can use the results of this study to tailor their programs towards specific sub-groups of hybrid entrepreneurs who show high interest in business takeover. So far, most of the existing policy initiatives ignore hybrid entrepreneurship. This is an important oversight given the strong increase of hybrid entrepreneurship in recent years.

3.2 Literature review about hybrid entrepreneurship

Previous research on hybrid entrepreneurship can be divided into three main parts (Figure 3-1). The first part concerns the determinants of hybrid entrepreneurship versus full-time entrepreneurship, such as risk aversion (e.g., Raffiee and Feng, 2014; Wennberg et al., 2006; Yuanita and Indudewi, 2015), self-evaluation (e.g., Raffiee and Feng, 2014), education (e.g., Folta et al., 2010; Raffiee and Feng, 2014), experience (e.g., Folta et al., 2010; Raffiee and Feng, 2014), and socio-demographic factors (e.g., Gruenert, 1999; Herslund and Tanvig, 2012; Petrova, 2012; Strohmeyer et al., 2006). Another section of the literature discusses how a hybrid entrepreneur distributes time and effort between wage work and a new business (e.g., Burmeister-lamp et al., 2012; Lévesque and MacCrimmon, 1997; Lévesque and Schade, 2005; Petrova, 2012), while a third section of the literature investigates the transition behavior of hybrid entrepreneurs, namely what motivates hybrid entrepreneurs to become full-time entrepreneurs (e.g., Block and Landgraf, 2016; Thorgren et al., 2016; Viljamaa and Varamäki, 2015).

Yet, the literature regarding entry into hybrid entrepreneurship does not differentiate the ways of becoming an entrepreneur; that is, a hybrid entrepreneur can start a new firm or purchase an existing firm. Before filling in this research gap by analyzing hybrid entrepreneurs' entry modes, this section presents a literature review on hybrid entrepreneurs' definition, motivation and entry determinants, which are relevant to understanding this specific type of entrepreneurship.

Figure 3-1: Previous research on hybrid entrepreneurship and the research gap

Source: Own illustration.

3.2.1 Definition of hybrid entrepreneurship

A significant characteristic of a hybrid entrepreneur is that the person runs the new business while simultaneously working in a firm as an employee. The multitask nature of hybrid entrepreneurship urges the entrepreneur to effectively distribute his or her time and effort between the new business and the paid work. Based on an individual's time allocation, Yuanita and Indudewi (2015) define hybrid entrepreneur as a person who has his or her own firm while working at least 24 hours a week in paid employment. Another way of defining hybrid entrepreneur considers the income from entrepreneurship in proportion to the payment from wage work. Wennberg et al. (2006) define a part-time entrepreneur as a person who earns less than 50% of his or her income from entrepreneurship. If the proportion is greater than or equal to 50%, the individual is categorized as a full-time entrepreneur. A similar definition appears in the study of Viljamaa and Varamäki (2015), in which hybrid entrepreneurs do not primarily depend on the income from entrepreneurship, but rather on income from their paid job.

A more recent study from Bögenhold and Klinglmair (2016) combines the time allocation dimension with the financial income dimension to identify hybrid entrepreneurship. Accordingly, the authors categorize hybrid entrepreneurs into three groups: running self-employment activity as a main business, running self-employment activity as a sideline business, and a mixture of both.

Using a sample of 116 Austrian one-person hybrid enterprises, the authors find that 53.3% of hybrid entrepreneurs work primarily as paid employees and are self-employed on a part-time basis. In other words, more than half of hybrid entrepreneurs invest more time in wage work than in self-employment and receive higher payment from that work. By contrast, only 15.5% of hybrid entrepreneurs take wage work as a secondary job while mainly relying on self-employment.

The above definitions of hybrid entrepreneurship are difficult to apply in academic research since there is no universal rule regarding the threshold of time devoted in entrepreneurial activities or the proportion of earnings from entrepreneurship and wage work. So far, research on hybrid entrepreneurship simply defines the term by its dual nature of entrepreneurship and wage work. A more common definition regards hybrid entrepreneurs as individuals who are involved in entrepreneurial activities while simultaneously retaining a paid job (e.g., Block and Landgraf, 2016; Gruenert, 1999; Petrova, 2012; Schulz et al., 2016; Thorgren et al., 2016). This definition does not consider which task—entrepreneurship or wage work—occupies more time or generates more revenue, but concentrates on the fact that hybrid entrepreneurs need to perform two tasks during their working hours. Folta et al. (2010) and Raffiee and Feng (2014) impose a more restricted definition of hybrid entrepreneurship. They define hybrid entrepreneurs as: 1) simultaneously being employed and self-employed, 2) being an employee in the same firm for two consecutive years. The second constraint is used to exclude individuals who switch back and forth between employment and self-employment.

3.2.2 Motivation for hybrid entrepreneurship: theoretical explanations

Campbell (1992) analyzes motivations behind entrepreneurship using a utility maximization model. He finds a person's decision of whether to enter into entrepreneurship is made upon the utility difference between employment and self-employment. This model has been extended in the study of Douglas and Shepherd (2002), which argues that entrepreneurial decisions are determined by a person's entrepreneurial ability, attitude towards work, risk attitude, preference for independence, and tolerance of working conditions. In the context of hybrid entrepreneurship, the same logic applies: a person chooses running his or her own business and working as an employee at the same time only if the expected utility of doing so surpasses the expected utility of being either a full-time entrepreneur or a full-time employee. With respect to measurement of expected utility, both financial and non-financial aspects of the utility must be taken into consideration. The

former refers to wages, bonuses, and options, whereas the latter concerns autonomy, self-efficacy, and self-realization.

Hybrid entrepreneurship: financial motivation

The expected financial payback of running a new business is one factor that motivates a person to become an entrepreneur (Campbell, 1992; Fischer et al., 1993). The return from entrepreneurship can be, however, lower than from employment due to production and market uncertainty faced by entrepreneurial activities. For instance, Hamilton (2000) finds that entrepreneurs' earnings are not only lower but also grow more slowly than employee's earnings. Empirical evidence shows that the variance of earnings in entrepreneurship is larger than that in paid employment (Åstebro and Chen, 2014; Rees and Shah, 1986).

Hybrid entrepreneurship seems to be a solution to alleviate the shortage of reduced income accompanied by entrepreneurial behavior, since entrepreneurs can remain in employment for financial benefits while they are simultaneously involved in entrepreneurial activities (Folta et al., 2010; Raffiee and Feng, 2014; Schulz et al., 2016). In the study of Lévesque and MacCrimmon (1997), owners of firms listed in Inc. 500 magazine in 1995 report that after they founded their new firms, they still worked as employees in the former-employer firm for an average of four months before they resigned. This was because they still needed money generated from the wage work to support themselves and their families. This study reveals an advantage of being a hybrid entrepreneur—one can use the income from the wage work to compensate for a possibly low initial income as an entrepreneur (Solesvik, 2017). Even if their new business fails, hybrid entrepreneurs can still return to full-time employment, and their living standard is less likely to be affected by business failure.

Hybrid entrepreneurship: non-financial motivation

Uncompetitive wages and lesser income growth do not hinder people from becoming entrepreneurs. The finding that entrepreneurs earn less than employees after controlling for individual characteristics implies that financial income may not be the main determinant for an individual to decide upon entering into entrepreneurship (Hamilton, 2000). As for hybrid entrepreneurs, they have less concern regarding income losses than do full-time entrepreneurs, because they remain in

employment during the entrepreneurship process. In this regard, the occurrence of hybrid entrepreneurs may be accrued to non-financial motivations.

Self-actualization. Maslow (1943) theorizes five hierarchical needs to explain human motivation. The lower levels of needs, e.g., the need for food, shelter and safety, provide necessities for a person to live in a society; the higher levels of needs, e.g., self-esteem and self-actualization, drive a person to participate in activities that fulfill individual objectives. Entrepreneurial activity is regarded as an adventurous, flexible, and creative endeavor. Hence, individuals may be motivated by an intrinsic desire to take the baton of entrepreneurship (Fischer et al., 1993). The greater the entrepreneurial drive, the more likely a person is using entrepreneurship as a way to achieve self-esteem and self-actualization (Carland et al., 1995). This argument can also be applied to explain motivation behind hybrid entrepreneurship. Tornikoski et al. (2015) conducted a survey on 238 Finish hybrid entrepreneurs, and asked them to report their primary motivation to become a hybrid entrepreneur. “Personal fulfillment” is found to be the most important motivation of engaging in hybrid entrepreneurial activities, with “added income” ranking the second. This substantiates hybrid entrepreneurship as a vehicle for self-esteem and self-actualization.

Passion. Entrepreneurial passion is defined as “a consciously accessible, intense positive feeling” (Cardon et al., 2009, p. 515) that may inspire individuals to break through barriers to enter into entrepreneurship and encourage them to remain in entrepreneurship. Hybrid entrepreneurship, which allows flexibility for entrepreneurial activities, may be better suited for passionate individuals with an ambition for entrepreneurship. A survey of 262 Swedish hybrid entrepreneurs conducted by Thorgren et al. (2014) reports passion as the most important motivation for the interviewed hybrid entrepreneurs (34% choose “passion” as the main motive). The level of passion a person holds differs among hybrid entrepreneurs who have different characteristics, experience, personal traits, and time to commit to entrepreneurship. In particular, passion is less likely to be the main motive for hybrid entrepreneurs who are younger or those who spend more time on business, because a negative emotion against entrepreneurship may occur among younger and inexperienced entrepreneurs and among people who spend excess time on building new ventures while failing to devote time to private life (Thorgren et al., 2014). Furthermore, entrepreneurial passion diminishes as the length of entrepreneurship increases, because in the later stage of entrepreneurship other chances or opportunities that can distract hybrid entrepreneurs from their

work may appear, which can generate a negative emotion towards entrepreneurship (Nordström et al., 2016).

Preparation for transition. Hybrid entrepreneurs are comprised of a group of heterogeneous people; some of them use the hybrid period as a preparation stage for subsequent transition into full-time entrepreneurship (Solesvik, 2017). It has been shown that hybrid entrepreneurs are more likely to transition into full-time status than entrepreneurs who transition directly from paid employment to full-time entrepreneurship (Folta et al., 2010; Wennberg et al., 2006). Moreover, hybrid entrepreneurs are more likely to leave entrepreneurship than are full-time entrepreneurs (Wennberg et al., 2006). These findings indicate that the dual work period may be regarded by hybrid entrepreneurs as important in enabling them to try out their business ideas or to implement their own philosophy in a new business (Wennberg et al., 2006). Should this try-out fail, hybrid entrepreneurs can still return to full-time wage employment. The study of Raffiee and Feng (2014) further substantiates hybrid entrepreneurship as a process of learning by showing that full-time entrepreneurs with hybrid experience perform better than those who do not have such an experience. Through hybrid entrepreneurship, individuals can better understand the limits of their knowledge and ability (Petrova, 2011), as well as the plausibility of their entrepreneurial ideas, thereby increasing their business survival chances in later full-time entrepreneurship. In this sense, hybrid entrepreneurship functions as a buffer for cautious entrepreneurs, providing them with opportunities to explore their business ideas before entering into full-time entrepreneurship (Wennberg et al., 2006).

3.2.3 Determinants of hybrid or full-time entrepreneurship

Whereas full-time entrepreneurship requires more attention, effort, caring, and responsibility, hybrid entrepreneurship demands less time and bears lower risk. When facing the choice of starting a new venture on a hybrid or a full-time basis, an individual's decision is made based on his or her personality (Raffiee and Feng, 2014; Yuanita and Indudewi, 2015), experience (Folta et al., 2010; Raffiee and Feng, 2014), socio-demographic status (Petrova, 2012), opportunity (educational attainment), and switching cost (industry tenure and employer size) (Folta et al., 2010; Raffiee and Feng, 2014).

Hybrid entrepreneurship reduces and buffers personal risks and uncertainties attributed to starting a new venture on a full-time basis (Folta et al., 2010; Raffiee and Feng, 2014). Thus, a

hybrid status is more attractive than a full-time status to risk averse individuals (Raffiee and Feng, 2014; Yuanita and Indudewi, 2015). Lowly self-evaluated individuals in starting a new venture are more likely to enter into entrepreneurship through a hybrid status. In contrast, highly self-evaluated individuals are more confident in their ability to run a new business on a full-time basis (Raffiee and Feng, 2014). Moreover, a transition from paid employment to full-time entrepreneurship implies loss of stable income, pension, and other firm-related benefits. Therefore, entrepreneurs have to weigh their opportunity and switching costs when making the entrepreneurship entry decision (Folta et al., 2010). Folta et al. (2010) find that hybrid entrepreneurship is more common in entrepreneurs who have more education, longer industry tenure, and work experience at larger firms.

However, there are also negative aspects for hybrid entrepreneurship. Hybrid entrepreneurs may experience more stress than full-time entrepreneurs or full-time paid employees, because they have to allocate their limited time and effort among multiple activities, such as wage work, entrepreneurship, and leisure (Thorgren et al., 2014). Furthermore, employers may disapprove of or even prevent their employees from working concurrently on entrepreneurial activities, since these activities distract employees from their wage work (Hellmann, 2007).

3.3 Data and method

3.3.1 Sample

This analysis uses the same data set that is used in Chapter 2 (SINE: *Système d'Information sur les Nouvelles Entreprises*). It comprises information about entrepreneurs and ventures that were created or taken over in the first half of 2002 in France. To identify hybrid entrepreneurs, this study uses question 14 of the SINE survey: “If you currently work with a main title in another firm and received payment, your status is: 1) salaried worker; 2) non-salaried worker; 3) no other activity or secondary profit-making activity.”⁸ In accordance with the definition of hybrid entrepreneurship in previous research (Block and Landgraf, 2016; Schulz et al., 2016), this study defines hybrid entre-

⁸ INSEE definition: “salaried workers refer to all persons who work, under the terms of a contract, for another resident institutional unit in exchange for a salary or equivalent remuneration; non-salaried workers are persons who work but who are compensated in a form other than a salary”. Retrieved from <http://www.insee.fr/en/methodes/default.asp?page=definitions/emploi-salarie.htm> on May 7th, 2016.

preneurs as individuals who are running a new business and at the same time are working as salaried employees. Hence, respondents who chose option 1) are identified as hybrid entrepreneurs, amounting to 12,434 individuals.

The following steps are applied to achieve the final sample. First, family takeovers (N=68) and management buyouts (N=58) are excluded from the estimation sample, because the former is not attainable for nonfamily successors, and the latter is not an option for outside employees (Bastie et al., 2013; Parker and Van Praag, 2012). Second, observations with missing data are eliminated. These data reduction steps left us with a sample of 9,032 entrepreneurs, of which 500 (5.5%) chose business takeover and 8,532 (94.5%) chose new venture start-up. The above percentage of hybrid entrepreneurs choosing business takeover is lower than the percentages reported by prior studies, which were based mostly on full-time entrepreneurs: Parker and Van Praag's (2012) sample includes a 7.8% share for business takeover; the numbers for Bastie et al. (2013) and Block et al. (2013b) are 12.3% and 21.9%, respectively.

3.3.2 Variables

Dependent variable: the dependent variable, *business takeover*, equals one if the hybrid entrepreneur chose business takeover as entry mode and equals zero if the entrepreneur chose new venture start-up.⁹

This analysis examines the effect of various variables on the entry mode of hybrid entrepreneurs:

Hybrid entrepreneur's work experience: This analysis takes into account two types of work experience attained by the individual before becoming a hybrid entrepreneur. The first one refers to the hybrid entrepreneur's prior occupation status, i.e., six occupation categories are identified, including *CEO*, *self-employed*, *senior manager/liberal professional*, *worker*, *not-working*, and *other types of employees*. Second, in line with previous empirical finding, same sector experience

⁹ According to INSEE, takeover happens when "a legal entity partially or totally takes over the business of one or more economic entities of another legal entity." Retrieved from <http://www.insee.fr/en/methodes/default.asp?page=definitions/reprise-entreprise.htm> on May 7th, 2016. SIRENE (Computerised System of the National Register of Enterprises and Establishments) defines a new venture as a new legal entity, which is assigned to a new nine-digit Siren number when it is established. Retrieved from https://www.sirene.fr/sirene/public/static/definitions?sirene_locale=en on May 7th, 2016.

can affect (full-time) entrepreneurship entry mode (Bastié et al., 2013). Thus, *same sector experience* is coded to measure whether the entrepreneur has worked in the same sector prior to entrepreneurship.

Hybrid entrepreneur's educational attainment: Both formal education and occupational training are included in the analysis to reflect the entrepreneur's educational attainment. Formal education refers to school education, which is found to be positively associated with new venture start-up entry (Bastié et al., 2013; Block et al., 2013b; Parker and Van Praag, 2012). In this analysis, *educational attainment* is a set of categorical variables that measure the entrepreneurs' highest educational degree at the time of entering into hybrid entrepreneurship. Occupational training measures whether the entrepreneur has *received entrepreneurial training* for starting a business preceding entrepreneurship.

Hybrid entrepreneur's socio-demographic status: With respect to age, senior entrepreneurs have been shown to prefer business takeover over new venture start-up (Block et al., 2013b). Bastié et al. (2013) show that female entrepreneurs are more likely to choose new venture start-up. Moreover, Kushnirovich et al. (2017) find differences between immigrants and native-born persons regarding their perceived feasibility of becoming an entrepreneur. Based on these studies, this analysis includes the hybrid entrepreneur's *age*, *gender*, and *citizenship* in the regression model.

Hybrid entrepreneur's motivation: The first variable, *growth ambition*, equals one if the hybrid entrepreneur aims at developing his or her business, and zero if s/he becomes an entrepreneur only to ensure his or her own job. Another dimension of motivation is measured by whether an individual plans to be a *long-term entrepreneur* or to keep the business only for a short time period. This study argues that growth and long-term oriented entrepreneurs are more willing to take challenges and higher risks. Hence, these entrepreneurs are more likely to start a new firm on their own, instead of acquiring an existing firm (Block et al., 2013b).

Support for the hybrid entrepreneur: Entrepreneurs may receive support from close family or friends who have entrepreneurship or business experience (Bastié et al., 2013). Therefore, variable *entrepreneurs in close relational circle* is coded as one if the hybrid entrepreneur has business leaders or self-employed individuals in his or her close relational circle. Another type of support for the entrepreneur is government support, which is measured by whether the hybrid entrepreneur has *received social benefit*.

Firm's financial structure and public aid: In line with Parker and Van Praag (2012) and Bastié et al. (2013), this study accounts for the start-up capital of the new venture or business takeover through a set of categorical variables: *start-up capital less than 2,000 €*, *between 2,000 € and 16,000 €*, *between 16,000 € and 80,000 €*, and *larger than 80,000 €*. Next, the percentage of funding from the entrepreneur, family, or associate in the total amount of start-up capital is included in the analysis. Finally, this study considers whether the firm has *received public aid* when it was started or taken over.

Regional environment: 26 regions in the dataset are classified into two categories according to regional population density and economic status. The variable *urban* equals one if the firm is located in urban area, and zero if it is in rural area.

Industry categories: This study controls for industry differences by including nine industry categories: *agricultural food*, *non-agricultural food*, *construction*, *commerce*, *transport*, *real estate*, *business services*, *personal services*, *education*, *health*, and *social work*. Business services and commerce make up more than half of the new venture start-ups founded by hybrid entrepreneurs, whereas more than half of the business takeovers occurred in the personal service sector.

Table A2-1 summarizes the operationalization of all dependent and independent variables.

3.3.3 Regression analysis

The hybrid entrepreneur subsample is selected out of a mixed sample of hybrid and full-time entrepreneurs, which may lead to a selection bias. To account for this possibility, this study performs a two-step Heckman probit model (Heckman, 1979), in which the dependent variable of the first stage selection regression is the *hybrid entrepreneurship* dummy and the dependent variable of the second stage outcome regression is the *business takeover* dummy. The independent variables in the selection regression are: the individual's prior occupation, his or her firm experience regarding employer size, same sector experience, educational attainment, whether there are entrepreneurs in close relational circle, age, gender, nationality, start-up capital, and firm location (Folta et al., 2010; Petrova, 2012; Raffiee and Feng, 2014; Wennberg et al., 2006). In the outcome

regression, a full set of independent variables described and discussed in the previous section is included in the analysis, except for firm experience regarding employer size.¹⁰

A rare events logistics regression, a simple logit regression (not accounting for selection bias) and a logit regression excluding solo entrepreneurs are conducted as robustness checks.

3.4 Result

3.4.1 Univariate results

Table 3-1 compares the characteristics of hybrid entrepreneurs who chose business takeover with those who chose new venture start-up. A t-test on the equality of means for all variables is conducted, and some interesting results can be observed. Regarding *prior work experience*, both former *CEOs* (31% vs. 21%) and *workers* (13% vs. 7%) favor business takeover as an entry mode, whereas *senior managers or liberal professionals* prefer new venture start-up (20% vs. 6%). Moreover, hybrid entrepreneurs who choose new venture start-up possess, on average, higher *educational attainment* (for example, higher than A-level diploma is 45% vs. 18%), and are more likely to be *French* (91% vs. 86%). On the contrary, senior hybrid entrepreneurs *aged over 50* are more likely to choose business takeover (22% vs. 18%). With respect to hybrid entrepreneurs' motivation, the univariate test result shows that hybrid entrepreneurs who choose business takeover show a stronger *growth ambition* than those who choose new venture start-up (69% vs. 55%). The comparison of the firms' financial structure shows that business takeovers are characterized by higher *start-up capital* (for example, start-up capital over 80,000 euro is 27% vs. 9%) and a lower *percentage of self-funding* (37% vs. 62%). Moreover, new venture start-ups are more common in urban areas than are business takeovers (70% vs. 63%).

¹⁰ Here variables *small firm*, *medium firm*, and *large firm experience* are excluded in the outcome regression because these variables are insignificant in a simple logistic regression which includes all independent variables and codes *business takeover* as the dependent variable. However, they are significant in the selection regression presented in Table A3-2 (Appendix). This indicates that these variables affect an individual's choice of entering on a full-time or a part-time basis, but do not affect the individual's entry mode choice between new venture start-up and business takeover.

Table 3-1: Descriptive statistics

	New venture start-up	Business takeover	t-values ^a of tests of mean differences
	Mean	Mean	
<i>Hybrid entrepreneur's prior work experience</i>			
CEO	0.21	0.31	-4.88***
Self-employed	0.04	0.06	-1.88
Senior manager, liberal professional	0.20	0.06	11.68***
Worker	0.07	0.13	-3.97***
Not-working	0.06	0.05	1.63
Other types of employees	0.42	0.39	1.40
Same sector experience	0.45	0.48	-1.49
<i>Hybrid entrepreneur's educational attainment</i>			
No diploma	0.11	0.24	-6.45***
Lower than A-level diploma	0.23	0.42	-8.44***
A-level diploma	0.20	0.16	2.64**
A-level plus two years of education	0.14	0.09	3.55***
A-level plus over two years of education	0.31	0.09	16.19***
Received entrepreneurial training	0.18	0.17	0.30
<i>Hybrid entrepreneur's socio-demographic status</i>			
Age under 35	0.34	0.25	4.58***
Age between 35 and 49	0.47	0.53	-2.28*
Age over 50	0.18	0.22	-2.05*
Female	0.27	0.31	-1.62
French	0.91	0.86	3.08**
<i>Hybrid entrepreneur's motivation</i>			
Growth ambition	0.55	0.69	-6.34***
Long-term entrepreneurship	0.83	0.84	-0.91
<i>Support for the hybrid entrepreneur</i>			
Entrepreneurs in close relational circle	0.66	0.63	1.64
Received social benefit	0.03	0.04	-1.63
<i>Firm's financial structure and public aid</i>			
Start-up capital: <2k	0.24	0.05	16.55***
Start-up capital: 2-16k	0.52	0.25	13.35***
Start-up capital: 16-80k	0.15	0.42	-12.04***
Start-up capital: >80k	0.09	0.27	-9.04***
Percentage of self-funding	0.62	0.37	14.18***
Received public aid	0.10	0.09	0.63
Urban	0.70	0.63	3.07**
N entrepreneurs	8,532	500	9,032

Notes: ^a Welch's t-test. Significance level: * p<0.05, ** p<0.01, *** p<0.001.

3.4.2 Regression results

To analyze potential multicollinearity issue, the correlations among the full set of independent variables as well as variance inflation factors (VIFs) are presented in Table A3-1 (Appendix). All VIFs are below 4, indicating that multicollinearity is unlikely to be a major concern in this analysis.

Table 3-2 displays the outcome regression of the Heckman probit model. The results of the selection regression are displayed in Table A3-2 (Appendix). The dependent variable in the outcome regression equals one if the hybrid entrepreneur chose business takeover as entry mode and zero if s/he chose new venture start-up.

Table 3-2 shows some interesting results regarding the impact of hybrid entrepreneurs' previous work status on their entrepreneurship entry mode. Hybrid entrepreneurs who were *CEOs*, *senior managers* or *liberal professionals* are more likely to choose new venture start-up. On the contrary, hybrid entrepreneurs who were *workers and non-working individuals* are more likely to opt for business takeover. There exist no significant effects for former *self-employed* individuals. Furthermore, the regression results show a positive relationship between *same sector experience* and business takeover entry mode.

Regarding *educational attainment*, higher educated entrepreneurs favor new venture start-up. However, whether the hybrid entrepreneur has *received entrepreneurial training* or not does not significantly affect his or her entry mode. In terms of socio-demographic status, this analysis does not find significant effects regarding *age* and *nationality*. With respect to gender, empirical result indicates that *female* hybrid entrepreneurs are more likely to choose business takeover. Moreover, business takeover is more likely to be chosen by hybrid entrepreneurs with stronger *growth ambition* and those having *received social benefit*.

With respect to firm characteristics, higher *start-up capital* is positively associated with business takeover, whereas new venture start-up is positively linked with a higher *percentage of self-funding* and having *received public aid*. In terms of location, the coefficient of the variable *urban* is negative and statistically significant, indicating that urbanity promotes new venture start-up.

Nine industry categories are included in the regression model and a test of joint significance yields a significant p-value ($p < 0.001$). Hence, the likelihood of choosing new venture start-up or business takeover distinguishes across different industries.

This study performs three robustness checks and presents the regression results in Table 3-3. First, a simple logit model is conducted which does not account for selection bias. Second, the dependent variable business takeover shows a relatively skewed distribution: only 5.5% of hybrid entrepreneurs chose business takeover, whereas 94.5% chose new venture start-up. A rare events logistic regression proposed by King and Zeng (2001) is used to correct for estimation bias caused by small samples or rare events data. Note that the rare events regression does not account for a potential selection bias related to hybrid entrepreneurship. Third, a narrow definition of entrepreneurship is adopted, which defines entrepreneurship activity as a coordination of at least two people (Raffiee and Feng, 2014). Hence, sole hybrid entrepreneurs who are the only employee in their firm are removed from the sample. Likewise, this robustness check does not account for selection bias. The estimation results of the three robustness checks are similar to the results of the main regression using Heckman probit model. In particular, results regarding variables such as *senior manager or liberal professional, worker, educational attainment, gender, and having received social benefit* are robust. Also, the estimation effects regarding firm characteristics such as *start-up capital, percentage of self-funding, received public aid, and urban location* are similar in the robustness checks as in the Heckman probit model.

Table 3-2: Determinants of entry mode for hybrid entrepreneurs

	Heckman probit model	
	Coefficient (standard error)	
<i>Hybrid entrepreneur's prior work experience</i>		
Benchmark: other types of employees		
CEO	-0.48**	(0.15)
Self-employed	0.21	(0.12)
Senior manager, liberal professional	-0.32***	(0.08)
Worker	0.36***	(0.07)
Not-working	0.52**	(0.17)
Same sector experience	0.28***	(0.05)
<i>Hybrid entrepreneur's educational attainment</i>		
Benchmark: no diploma		
Lower than A-level diploma	0.00	(0.06)
A-level diploma	-0.32***	(0.08)
A-level plus two years of education	-0.44***	(0.10)
A-level plus over two years of education	-0.64***	(0.13)
Received entrepreneurial training	-0.01	(0.05)
<i>Hybrid entrepreneur's socio-demographic status</i>		
Benchmark: age under 35		
Age between 35 and 49	0.06	(0.05)
Age over 50	0.11	(0.07)
Female	0.15**	(0.06)
French	-0.03	(0.07)
<i>Hybrid entrepreneur's motivation</i>		
Growth ambition	0.12*	(0.05)
Long-term entrepreneurship	-0.07	(0.05)
<i>Support for the hybrid entrepreneur</i>		
Entrepreneurs in close relational circle	-0.05	(0.04)
Received social benefit	0.30*	(0.13)
<i>Firm's financial structure and public aid</i>		
Benchmark: start-up capital: <2k		
Start-up capital: 2-16k	0.34***	(0.09)
Start-up capital: 16-80k	1.02***	(0.18)
Start-up capital: >80k	1.07***	(0.21)
Percentage of self-funding	-0.26**	(0.08)
Received public aid	-0.21*	(0.09)
Urban	-0.18***	(0.04)
Industry dummies are included	Yes***	
Constant	-0.29	(0.50)
N entrepreneurs	9,032	
Log likelihood	-23,988.40	
Chi2	905.15***	
Rho	-0.77	(p=0.1131)

Notes: Dependent variable: business takeover (dummy=1) versus new venture start-up (dummy=0). The estimation results of the selection regression of the Heckman probit model is presented in Table A3-2 (Appendix). Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001.

Table 3-3: Robustness checks

	Robustness check I	Robustness check II	Robustness check III
	Simple logistic re- gression	Rare events re- gression	The sample ex- cludes sole firm owners
<i>Hybrid entrepreneur's prior work experience</i>			
Benchmark: other types of employees			
CEO	0.03 (0.15)	0.03 (0.15)	-0.07 (0.17)
Self-employed	-0.22 (0.24)	-0.21 (0.24)	-0.45 (0.28)
Senior manager, liberal professional	-0.74** (0.23)	-0.72** (0.23)	-0.93*** (0.25)
Worker	0.55** (0.18)	0.55** (0.18)	0.63** (0.23)
Not-working	-0.14 (0.27)	-0.13 (0.27)	0.22 (0.31)
Same sector experience	0.26* (0.11)	0.26* (0.11)	0.23 (0.13)
<i>Hybrid entrepreneur's educational attainment</i>			
Benchmark: no diploma			
Lower than A-level diploma	-0.11 (0.15)	-0.11 (0.15)	0.03 (0.18)
A-level diploma	-0.70*** (0.18)	-0.69*** (0.18)	-0.49* (0.21)
A-level plus two years of education	-0.91*** (0.21)	-0.90*** (0.21)	-0.81*** (0.24)
A-level plus over two years of education	-1.46*** (0.21)	-1.44*** (0.21)	-1.25*** (0.24)
Received entrepreneurial training	0.01 (0.15)	0.01 (0.15)	0.09 (0.18)
<i>Hybrid entrepreneur's socio-demographic status</i>			
Benchmark: age under 35			
Age between 35 and 49	0.28* (0.13)	0.28* (0.13)	0.51** (0.16)
Age over 50	0.42* (0.16)	0.41* (0.16)	0.53** (0.19)
Female	0.36** (0.13)	0.35** (0.12)	0.31* (0.15)
French	-0.28 (0.17)	-0.29 (0.17)	-0.11 (0.19)
<i>Hybrid entrepreneur's motivation</i>			
Growth ambition	0.35** (0.13)	0.35** (0.12)	0.08 (0.15)
Long-term entrepreneurship	-0.13 (0.15)	-0.13 (0.15)	-0.01 (0.17)

Notes: Dependent variable: business takeover (dummy=1) versus new venture start-up (dummy=0). Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001; standard errors in parentheses.

Table 3-3 (continued): Robustness checks

	Robustness check I	Robustness check II	Robustness check III
	Simple logistic re- gression	Rare events re- gression	The sample ex- cludes sole firm owners
<i>Support for the hybrid entrepreneur</i>			
Entrepreneurs in close relational circle	-0.16 (0.11)	-0.16 (0.11)	-0.28* (0.13)
Received social benefit	1.03*** (0.29)	1.04*** (0.28)	1.09** (0.36)
<i>Firm's financial structure and public aid</i>			
Benchmark: start-up capital: <2k			
Start-up capital: 2-16k	0.91*** (0.23)	0.90*** (0.23)	-0.05 (0.28)
Start-up capital: 16-80k	2.47*** (0.23)	2.43*** (0.23)	1.31*** (0.29)
Start-up capital: >80k	2.72*** (0.25)	2.68*** (0.25)	1.52*** (0.30)
Percentage of self-funding	-0.78*** (0.14)	-0.77*** (0.14)	-0.66*** (0.16)
Received public aid	-0.73*** (0.19)	-0.71*** (0.19)	-0.88*** (0.25)
Urban	-0.24* (0.11)	-0.23* (0.11)	-0.40** (0.13)
Industry dummies are included	Yes***	Yes***	Yes***
Constant	-3.39*** (0.39)	-3.33*** (0.39)	-2.02*** (0.46)
N entrepreneurs	9,032	9,032	3,905

Notes: Dependent variable: business takeover (dummy=1) versus new venture start-up (dummy=0). Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; standard errors in parentheses.

3.5 Discussion

This is the first study that investigates the entry mode of hybrid entrepreneurs. Previous studies of entrepreneurship entry mode did not focus on or explicitly left out hybrid entrepreneurs (e.g., Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015). Because hybrid entrepreneurs are different from full-time entrepreneurs in terms of motivation (Burmeister-lamp et al., 2012), time commitment (Burmeister-lamp et al., 2012; Lévesque and Schade, 2005; Petrova, 2012), and risk attitude (Lévesque and Schade, 2005; Raffiee and Feng, 2014), it is necessary to separate hybrid entrepreneurs from full-time entrepreneurs when examining entrepreneurship entry mode. This study recognizes the uniqueness of hybrid entrepreneurs and therefore focuses on their entry modes distinguished by business takeover and new venture start-up. The findings show that new venture creators and business acquirers are different with respect to their occupational experience, educational attainment, gender, and whether or not they have received social benefit. Also, new venture start-ups and business takeovers differ from each other regarding their financial status and firm location. In particular, this study has four important contributions to former literature and business practice.

First, this study shows that hybrid entrepreneurs who were formerly senior managers or liberal professionals tend to choose new venture start-up as an entrepreneurship entry mode. It argues that financial benefit is not the primary motive for entrepreneurs who were formerly in management positions. In contrast, these persons are driven by non-financial aspects of entrepreneurship such as need for achievement (Johnson, 1990; Stewart and Roth, 2007), desire for autonomy and independence (Kuratko et al., 1997), and an escape from a former employer's poor management (Cooper, 1971; Garvin, 1983). By starting a new firm from scratch entrepreneurs can realize their non-financial entrepreneurial motivations since they have freedom to structure the firm by their preferences from the onset. Moreover, because individuals in management positions are more likely to build an effective professional network (Debrulle and Maes, 2015), they may have more chances of finding new business opportunities and more resources to pursue these opportunities by creating a new business. Likewise, that higher educational attainment leads to new venture start-up can be explained by the argument that higher educated persons possess knowledge and ability that favor opportunity identification and exploitation so that they are more entrepreneurial than lower educated persons (Block et al., 2013a). People in liberal professions such as law and

accounting, which require authorized qualification as a proof of professional knowledge and skills, are more likely to start their own firm so that they can build a reputation that is closely connected to their names or titles, instead of taking over an existing firm that bears someone else's name.

Second, workers are more likely to take over an existing firm rather than starting a new one. The reasons for workers to resign from an employment relationship and subsequently enter into entrepreneurship are usually their dissatisfaction with their low wages or career ceilings (see Parker, 2009, for a discussion). As for these entrepreneurs who lack business networks and leadership experience, purchasing an existing firm seems to be a more reasonable way of becoming an entrepreneur, because the establishments and resources in the acquired firm can help them transition relatively smoothly from paid employment into entrepreneurship.

Third, the finding that female hybrid entrepreneurs prefer business takeover to new venture start-up contradicts what Kay and Schlömer-Laufen (2016) have found for female full-time entrepreneurs, suggesting a difference may exist between female full-time entrepreneurs and hybrid entrepreneurs in regards to their mode of entry. To explain this finding, consider previous research that shows that female entrepreneurs often face more difficulties in getting financial support for their new business from banks than do male entrepreneurs (Marlow and Patton, 2005). The possibility for female entrepreneurs to get credit from a bank depends on the selection criteria imposed upon the applicants as well as the gender of the bank loan officer (Carter et al., 2007). This study argues that female entrepreneurs may encounter some obstacles when entering into entrepreneurship, such as financial constraint and a lack of network support, which then hinders them from starting a new business from scratch and pushes them towards business takeovers that have an established track record.

Finally, this study finds that entrepreneurs in urban areas are more likely to start a new venture rather than taking over an existing firm. Characterized by dynamic economic sectors, mature business markets, and advanced technology, urban regions have greater capacity to nurture creative business projects such as new venture creation (Lee et al., 2004). Whereas in rural areas where business activities are not as active, business transfer may be a more popular way for people to become entrepreneurs. Moreover, previous research shows that knowledge spillovers are an important source of entrepreneurial opportunity and innovative start-up (Block et al., 2017). Due to the agglomeration effect spillovers have on regional business development, knowledge spillovers

in the form of new venture start-ups are more likely to occur in densely populated areas where abundant talents and business opportunities can find a match.

For policy makers, this study has implications for business transfer and new venture creation policy. Because business takeovers and new venture start-ups attract individuals with distinguished characteristics and backgrounds, they should be treated as two different entrepreneurship entry modes. In addition to entrepreneurial training programs for new venture creators, policy makers should notice the demand for launching support programs for business acquirers, in which entrepreneurs can obtain knowledge that is important and useful for business transfer. Furthermore, the results of this study show that amongst others, female entrepreneurs and former workers prefer business takeover to new venture start-up. These individuals are, however, often overlooked when firms seek outside successors. In order to successfully complete the business transfer process, policy makers can provide support to these individuals in the form of subsidized credits or business training programs. Finally, the finding that urban and rural entrepreneurs choose different entrepreneurship entry modes suggests that entrepreneurship policies should be differentiated across regions. For instance, because hybrid entrepreneurs in urban areas are more likely to choose new venture start-up, entrepreneurial training programs in those areas should focus on knowledge and skills that are essential for new venture creators. Conversely, training programs in rural areas can be set to fulfill the need for entrepreneurs seeking business takeovers.

3.6 Conclusion, limitations, and avenues for future research

Hybrid entrepreneurship is a worldwide phenomenon, yet it has not been widely studied by academic scholars. Using a large sample of hybrid entrepreneurs who entered into entrepreneurship in 2002, this study investigates hybrid entrepreneurs' entry modes between business takeover and new venture start-up. The results show that each entry mode is linked to some particular determinants. This study adds to the understanding of hybrid entrepreneurs and contributes to the literature on hybrid entrepreneurship and entrepreneurship entry mode.

This study has several limitations. First, in this study an entrepreneur's work status prior to entrepreneurship is identified, but it is unable to capture the diversity of an entrepreneur's work experience. Entrepreneurs may have held multiple occupations before they enter into entrepreneurship. Second, sector experience is measured according to the similarity between prior sector and present sector. However, a hybrid entrepreneur's industry tenure in the same sector may determine

the switching cost of entering into entrepreneurship, and consequently impact the entrepreneurship entry mode. Third, non-financial entrepreneurship intentions such as growth ambition are included in this study, while other non-financial motivations such as self-realization may play a role in determining entrepreneurship entry mode.

The following avenues for future research are proposed. First, Lazear (2005) finds that individuals with various work experience are more likely to become entrepreneurs. Future research could investigate how hybrid entrepreneurs' varied skillsets can affect their entrepreneurship entry modes. Moreover, longer industry tenure deters entrepreneurs from entering into full-time entrepreneurship (Folta et al., 2010). Future research should incorporate various measurements of entrepreneurs' work experience including industry tenure. Second, financial motivations such as supplementing income and non-financial motivations such as self-realization have been found to affect hybrid entrepreneurs' transition behavior (Block and Landgraf, 2016). More research should be done to investigate how financial and non-financial motivations affect hybrid entrepreneurs' choice of entry mode. Third, it would be interesting to analyze which entry mode is more successful in terms of entrepreneur's income or firm's survival time (Bates, 1990; De Jong and Marsili, 2015). Such a study can provide information about the performance of different types of entrepreneurship, which can be useful for policy makers and individuals who intend to become entrepreneurs.

4 How does firm survival differ between business takeovers and new venture start-ups?¹¹

4.1 Introduction

Van de Ven et al. (1984) analyze the performance of 14 software companies and propose an analysis model using three approaches to explain firm success, namely entrepreneur, organization, and ecology approach. This analysis model is also reflected in Brüderl et al.'s (1992) paper, which investigates how firm mortality rate is shaped by an entrepreneur's characteristics, firm structure and strategy, and industry factors. In particular, the founder's human capital, which is acquired in life and via work, has significant impact on firm survival (Brüderl et al., 1992; Cooper et al., 1994; Ganotakis, 2012; Gimeno et al., 1997). For instance, the founder's previous work experience from the same sector or from small firms increases the survival likelihood of newly founded businesses (Bosma et al., 2004; Boyer and Blazy, 2014; Brüderl et al., 1992; Cooper et al., 1994; Elfenbein et al., 2010). With respect to organization factors, the survival of new ventures is determined by initial organization resources, such as start-up capital, with a greater amount of capital corresponding to a lower risk of failure (Bates, 1990; Duchesneau and Gartner, 1990). This chapter focuses on entrepreneurship survival determinants at the individual level, namely the entrepreneurs' experience and attributes, as well as at the firm level, namely the firms' financial structure.

From an individual's perspective, there are several paths towards entrepreneurship. Among others, new venture start-up and business takeover are two important entry modes (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015). The takeover path is less hazardous than the new venture path, because acquired firms have already established critical features, such as employees and products (Dyke et al., 1992; Shepherd et al., 2000), whereas new venture start-ups suffer from liability of newness, which increases their risk of failure (Aldrich and Auster, 1986; Bates, 1990). Most analyses concerning start-up survival concentrate on newly created firms; only a few studies point out that business takeovers

¹¹ This chapter is based on a working paper which is cooperated with Jörn Block (Universität Trier), Frank Lasch (Montpellier Business School), Frank Robert (Montpellier Business School) and Roy Thurik (Erasmus University Rotterdam). The working paper was presented by me at the G-Forum conference in Kassel on October 8th, 2015, and at the workshop "Economics of Entrepreneurship and Innovation" (EoEI) in Trier on June 3rd, 2015.

grow faster and achieve higher survival rates than new venture start-ups (Bates, 1990; Dyke et al., 1992). This study recognizes the differences between new venture start-ups and takeovers, and then treats them as two distinguished paths towards entrepreneurship.

Two research questions are proposed in this study. First, this analysis focuses on how business takeovers differ from new venture start-ups in terms of survival probability (RQ 3.1). Second, this study intends to identify the individual-level and firm-level characteristics that affect the survival rate of business takeovers and new venture start-ups and, more importantly, how the survival determinants differ between these two types of entrepreneurship (RQ 3.2).

In order to answer these questions, this study conducts analyses using a large sample of business takeovers and new ventures start-ups over an observation period of 68 months. With respect to RQ 3.1, this study finds that business takeovers survive longer than new venture start-ups, which corroborates previous findings from Bates (1990) and Dyke et al. (1992). However, if one compares firm survival between two selected samples of new venture start-ups and takeovers, which are constructed using propensity score matching, the difference in their survival rates disappears. Furthermore, using these two selected samples, this study contrasts the survival determinants of new venture start-ups with those of takeovers, and finds that most factors affect the survival rate of both groups in similar ways. However, some discrepancies still exist. For instance, entrepreneurs' small firm work experience and motivation to exploit business opportunity increase new venture start-ups' survival chances; however, for takeovers, these factors do not matter. Moreover, a negative impact of public aid on business takeovers' survival chances has been found, while this impact does not exist for new venture start-ups.

This study contributes to the literature on firm survival by pointing out that new venture start-ups and takeovers are two distinguished entrepreneurship paths in terms of their survival chances and survival determinants. Also, it enriches the knowledgebase on small firm effect (Elfenbein et al., 2010; Gompers et al., 2005) as well as necessity and opportunity entrepreneurship (Baptista et al., 2014; Block and Wagner, 2010), as this study shows that the impact of small firm experience and entrepreneurial motivation on firm survival differs across the chosen entrepreneurship paths. Moreover, the finding regarding the impact of public aid on business takeovers suggests that policy makers should reevaluate support mechanisms for business transfers, and provide each type of entrepreneur with a suitable support program.

4.2 Data set and sample

This study uses the same data set as used in Chapters 2 and 3 (SINE: *Système d'Information sur les Nouvelles Entreprises*). In September 2002, INSEE sent a questionnaire to entrepreneurs of all new venture start-ups and business takeovers occurring in the first half of 2002 in France, and asked the respondents to report information about themselves and their businesses. Two follow-up surveys were sent out in September 2005 and September 2007. Because the survey was mandatory for all new ventures, irrespective of whether they were newly founded or acquired, the response rate was very high (92,966 out of 100,731 firms contacted). The broad-coverage of new venture start-ups and business takeovers assures credibility and generalizability for this analysis.

According to INSEE, new venture start-up is defined as the creation of a new legal entity that is attributed to a new nine-digit registration number, while business takeover refers to cases in which an entrepreneur takes over an outside venture.¹²

Previous studies show that occupational experience is one of the dimensions of human capital that affects a new venture's survival probability (Brüderl et al. 1992; Cooper et al. 1994; Gimeno et al. 1997). Because this study focuses on individuals who have work experience before they enter into entrepreneurship, it excludes former self-employed individuals, students, homemakers, and long-time unemployed individuals from the sample. The final sample consists of 34,872 entrepreneurs, among which 3,758 (10.78%) chose to take over an existing firm, and 31,114 (89.22%) chose to start a new venture from scratch.

4.3 Methods and variables

4.3.1 Propensity score matching

This analysis is aimed at comparing the survival determinants of new venture start-ups with the survival determinants of business takeovers at both the individual and firm levels. Because takeovers account for only one fifth of all firms in the full sample, a direct comparison between takeovers and new venture start-ups might yield estimation bias. Moreover, entrepreneurs may not be randomly assigned to new venture start-ups and takeovers. For instance, industry experience,

¹² The SINE dataset includes three types of business takeovers: family firm takeovers, management buyouts and outside takeovers. The first two types of takeovers are excluded from the analysis because they are unavailable for nonfamily members and outside employees, respectively (Bastie et al., 2013; Parker and Van Praag, 2012).

management experience and start-up capital play an important role in an individual's entrepreneurship entry mode choice (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012). Hence, this study implements a propensity score matching approach to construct a subsample of new venture creators that are similar to business acquirers in terms of individual and firm characteristics (Becker and Ichino, 2002; Caliendo and Kopeinig, 2008). In the pioneer work of Rosenbaum and Rubin (1983), propensity score is defined as "the conditional probability of assignment to a particular treatment given a vector of observed covariates" (p. 41). In other words, the propensity score measures the likelihood of something that could have happened (but never did) with all relevant covariates under control.

This analysis controls for all possible factors that may affect an individual's entrepreneurship entry mode choice across new venture start-up and business takeover. A logit regression using the full sample is conducted, with the dependent variable equaling one if an entrepreneur chooses business takeover, and zero if s/he chooses new venture start-up. After the regression, propensity scores are predicted. A high propensity score assigned to a new venture creator implies that the entrepreneur had a strong likelihood of choosing takeover as his or her entrepreneurship entry mode, but, in fact, s/he chose to start a new firm from scratch. Because new venture creators are required to be as similar to business acquirers as possible, this study selects 3,758 new venture creators with the highest propensity scores from the original sample. Finally, two equal sized samples of new venture start-ups and takeovers are obtained for further analysis.

4.3.2 Cox proportional hazards model

The Cox proportional hazards model (Cox, 1972) has an advantage over simple logit regression because it deals with right-censored observations, i.e., firms that are still operating at the end of the observation period. Cox regression was initially used in biometrics research, but was later applied in the management field to study firm survival (Agarwal and Audretsch, 2001; Audretsch and Mahmood, 1995; Taylor, 1999).

This study uses the Cox proportional hazards model to analyze the survival determinants of new venture start-ups and business takeovers:

$$h_j(t) = h_0(t) \exp(\beta_1 x_{j1} + \beta_2 x_{j2} + \dots + \beta_k x_{jk}), \quad (4-1)$$

where $h_j(t)$, representing the hazard rate of firm j at time t , is a function of the baseline hazard $h_0(t)$ and a vector of independent variables x_{j1}, \dots, x_{jk} . $h_0(t)$ refers to the hazard rate if all independent variables are equal to one; x_{j1}, \dots, x_{jk} are k covariates that measure an entrepreneur's individual characteristics and a firm's characteristics.

4.3.3 Variables

Dependent variable

Survival months: This study defines a firm's survival time as the number of months between its creation or acquisition and its cessation. In the sample, all firms were either founded or acquired between January and June 2002. Since the third (and final) wave of the survey was conducted in September 2007, the survival months of new venture start-ups and takeovers are between 1 month and 68 months.¹³ The data is right censored, as some firms were still alive when the last survey was conducted.

Independent variables

Work experience: An entrepreneur's previous work experience is measured in three dimensions. First, work experience from small, medium or large firms impacts entrepreneurial performance (Elfenbein et al., 2010; Stuart and Abetti, 1990). In this analysis, three categorical variables, *small*, *medium* and *large firm experience*, are coded to measure the entrepreneur's principal work experience acquired through working in firms with less than 49 employees, between 50 and 249 employees, and more than 250 employees, respectively (Klapper and Richmond, 2011). Second, an entrepreneur's occupational experience at management level increases firm performance (Ducheneau and Gartner, 1990; Dyke et al., 1992; Ganotakis, 2012). The variable *management experience* is coded as one if the entrepreneur reports to be a former CEO or a senior manager; otherwise, the dummy variable equals zero. Third, an entrepreneur's industry-specific experience is valuable

¹³ Unfortunately, due to authorization limits this study is unable to track the ownership change of new venture start-ups or takeovers during the observation period. Neither is it clear whether the firm exits because of liquidation or individual reasons. This study stresses this as a limitation in the last section of this chapter.

in helping a new venture to grasp market opportunities and prolong its survival time (Bosma et al., 2004; Boyer and Blazy, 2014; Gimeno et al., 1997). Hence, *same sector experience* is included, which measures whether the entrepreneur has worked in the same business sector prior to entrepreneurship.

Educational attainment: The entrepreneur's educational level is positively linked to the new venture's survival time (Bates, 1990; Boyer and Blazy, 2014). This study includes four dummy variables to measure the entrepreneur's highest educational degree preceding entrepreneurship. Moreover, a dummy variable *entrepreneurial training* is included to measure whether an individual has received entrepreneurial training before s/he enters into entrepreneurship.

Entrepreneurial motivation and ambition: First, the variable *full-time entrepreneurship* equals one if an entrepreneur claims not to be involved in any other business activities in addition to their entrepreneurial projects; it equals zero if the entrepreneur is a hybrid entrepreneur.¹⁴ Second, three types of entrepreneurial motivation are included in the Cox proportional hazards model. *Opportunity motivation* is equal to one if an individual chooses entrepreneurship because s/he has a new business idea or discovers a business opportunity; *necessity motivation* refers to individuals who report that they are forced into entrepreneurship; *mixed motivation of opportunity and necessity* pertains to individuals who feel constraint, but proactively choose entrepreneurship. Finally, *growth ambition* measures whether the entrepreneur pursues growth for his or her firm, and *long-term entrepreneurship* refers to the entrepreneur's long-term planning for the firm.

Support for entrepreneur: Because entrepreneurial knowledge and experience can be transferred within a close relational circle, entrepreneurs with self-employed parents are more likely to succeed than those without self-employed parents (Cooper et al., 1994; Duchesneau and Gartner, 1990). Moreover, entrepreneurs may have received financial support such as social benefit before starting their business. Furthermore, one-person firms face higher mortality risks than firms with multiple founders (Boyer and Blazy, 2014; Duchesneau and Gartner, 1990). This analysis captures these three types of support for entrepreneurs by incorporating three dummy variables into the model: *entrepreneurs in close relational circle*, *received social benefit* and *sole entrepreneur*.

Socio-demographic status: Using the SINE data collected in 1998, Boyer and Blazy (2014) find a positive relationship between new ventures' survival time and entrepreneurs' age, but a

¹⁴ Hybrid entrepreneurs are defined as individuals who are running a new business and working as salaried employees in other firms at the same time (Schulz et al., 2016; Block and Landgraf, 2016).

negative association between survival and non-EU citizenship. Thus, the entrepreneur's *age*, *gender* and *citizenship* are included in the model to analyze the entrepreneur's socio-demographic impacts on firm survival.

Firm's characteristics: Drawing from the literature that shows innovative start-ups are more risky than non-innovative start-ups (Boyer and Blazy, 2014), this research considers three types of innovation that might affect firm survival: *product innovation*, *process innovation* and *organizational innovation*. Moreover, a new firm's financial structure, which is measured by its *amount of start-up capital*, *received public aid* and *percentage of self-funding*, is taken into consideration, as they are shown to be success factors for newly created firms (Bates, 1990; Brüderl et al., 1992; Cooper et al., 1994). Finally, according to the finding of Headd (2003), which shows that firms in urban areas are less likely to survive, this study considers firm location to be a potential survival determinant by adding a dummy variable *urban* to measure its effect.

Other variables: Seven industry dummies are included in the analysis to capture industry difference: *agricultural food*, *non-agricultural food*, *commerce*, *transportation*, *real estate*, *business service* and *personal service*.

4.4 Results

An overview of the full sample consisting of all new venture start-ups and business takeovers is presented in Table 4-1. Irrespective of entrepreneurship type, 55% of all new firms founded in the first half year of 2002 were still active in September 2007, and the average survival time (including censored data) is 52 months. Table 4-1 also reports t-test results that compare the takeover sample with the new venture start-up sample *before* and *after* the propensity score matching approach is applied.

With the descriptive and empirical results, this section responds to the two research questions RQ 3.1 and RQ 3.2 proposed in Section 1.2.

Table 4-1: New venture start-up vs. business takeover before and after matching

	Full sam- ple (mean)	Before matching			After matching		
		New ven- ture start- up (mean)	Business takeover (mean)	t-test of mean differences	New ven- ture start- up (mean)	Business takeover (mean)	t-test of mean differences
Survival time	52.00	51.51	56.06	-14.91***	52.83	56.06	-7.30***
Survival rate	0.55	0.55	0.57	-2.39*	0.58	0.57	1.28
<i>Type of work experience</i>							
Small firm experience	0.72	0.71	0.79	-11.11***	0.78	0.79	-1.65
Medium firm experience	0.12	0.12	0.09	6.54***	0.10	0.09	1.24
Large firm experience	0.16	0.17	0.12	8.11***	0.13	0.12	0.97
Management experience	0.27	0.28	0.19	14.24***	0.24	0.19	5.32***
Same sector experience	0.65	0.66	0.61	5.67***	0.58	0.61	-2.54*
<i>Educational attainment</i>							
No diploma	0.13	0.13	0.14	-1.03	0.13	0.14	-0.71
Lower than A-level diploma	0.37	0.35	0.47	-13.60***	0.43	0.47	-3.60***
A-level diploma	0.18	0.18	0.19	-1.42	0.21	0.19	2.21*
A-level plus two years education	0.12	0.12	0.10	5.10***	0.11	0.10	1.96*
A-level plus over two years edu- cation	0.20	0.21	0.11	19.01***	0.12	0.11	1.74
Received entrepreneurial training	0.36	0.36	0.36	0.14	0.36	0.36	-0.24
<i>Entrepreneurial motivation and am- bition</i>							
Full-time entrepreneurship	0.83	0.82	0.91	-17.79***	0.87	0.91	-5.85***
Motivation: opportunity	0.77	0.76	0.87	-18.55***	0.84	0.87	-3.81***
Motivation: mix of opportunity and necessity	0.21	0.22	0.12	15.99***	0.16	0.12	3.83***
Motivation: necessity	0.02	0.02	0.01	11.05***	0.01	0.01	0.27
Growth ambition	0.48	0.47	0.58	-12.75***	0.59	0.58	1.05
Long-term entrepreneurship	0.90	0.90	0.92	-4.84***	0.92	0.92	0.43
<i>Support for the entrepreneur</i>							
Entrepreneurs in close relational circle	0.68	0.68	0.66	2.18*	0.70	0.66	3.00**
Received social benefit	0.06	0.07	0.04	6.95***	0.06	0.04	3.06**
Sole entrepreneur	0.51	0.54	0.33	25.91***	0.36	0.33	3.23**
<i>Socio-demographic status</i>							
Age under 35	0.40	0.40	0.45	-6.26***	0.43	0.45	-1.39
Age between 35 and 49	0.47	0.47	0.47	-0.03	0.48	0.47	0.69
Age over 50	0.13	0.13	0.08	11.34***	0.09	0.08	1.27
Female	0.23	0.22	0.33	-13.43***	0.35	0.33	1.97*
French	0.89	0.89	0.92	-6.96***	0.92	0.92	0.17
<i>Firm's characteristics</i>							
No innovation	0.58	0.59	0.51	9.34***	0.48	0.51	-2.61**
Product innovation	0.22	0.22	0.23	-1.73	0.27	0.23	4.40***
Process innovation	0.08	0.08	0.08	-0.05	0.08	0.08	0.82
Organizational innovation	0.16	0.15	0.24	-13.35***	0.20	0.24	-3.94***
Start-up capital: <2k	0.17	0.19	0.02	51.95***	0.02	0.02	-1.75
Start-up capital: 2-16k	0.52	0.56	0.20	50.06***	0.25	0.20	5.37***
Start-up capital: 16-80k	0.22	0.19	0.40	-25.40***	0.46	0.40	5.11***
Start-up capital: >80k	0.09	0.06	0.37	-39.61***	0.27	0.37	-9.78***
Received public aid	0.32	0.32	0.28	5.10***	0.34	0.28	5.30***
Percentage of self-funding	0.55	0.59	0.29	54.89***	0.29	0.29	0.71
Urban	0.64	0.65	0.52	15.39***	0.53	0.52	1.04
N entrepreneurs	34,872	31,114	3,758		3,758	3,758	

Notes: Welch's t-test is presented. Significance level: * p<0.05, ** p<0.01, *** p<0.001

4.4.1 How do takeovers differ from new venture start-ups in terms of survival probability?

Sample difference before matching

Figure 4-1 graphs Kaplan-Meier survival estimates for business takeovers and unmatched new venture start-ups. One can observe a higher survival rate for the former than for the latter. A Log-rank test also suggests that business takeovers and new venture start-ups have different survival distributions ($\chi^2= 30.38$, $p<0.001$).

To further check whether the above observation is robust, this study performs a t-test to compare business takeovers with new venture start-ups. Table 4-1 shows that the survival time and survival rate of new venture start-ups in the raw full sample differ from those of business takeovers. On average, the latter exist four and a half months longer than the former (56.06 vs. 51.51 months), though the survival rates are only marginally different, with business takeovers having a slightly higher survival chance (0.57 vs. 0.55).

Moreover, t-test results show significant differences at the individual-level and the firm-level across these two types of entrepreneurship. Regarding individual attributes, for instance, individuals who choose new venture start-up are more likely to have management experience (0.28 vs. 0.19) and same sector experience (0.66 vs. 0.61), while business acquirers are more driven by exploiting business opportunities (0.87 vs. 0.76), firm growth (0.58 vs. 0.47) and long-term vision (0.92 vs. 0.90). With respect to firm characteristics, t-tests reveal significant differences between takeovers and new venture start-ups regarding their financial structure. For example, creating a new venture requires less capital than acquiring one (0.19 vs. 0.02 for less than 2,000 euro), and new ventures are more likely to receive public aid (0.32 vs. 0.28) or to be self-funded (0.59 vs. 0.29).

Sample difference after matching

Previous studies have found that an individual's choice of whether to start a new venture from scratch or to take over an existing firm depends on the individual's previous work experience, socio-demographic status and the firm's financial power (Bastié et al., 2013; Block et al., 2013b; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012; Rocha et al., 2015). To account for these differences, this study applies a propensity score matching approach to construct a sample of

3,758 new venture start-ups, which consists of new venture creators who are similar to those who choose business takeovers in various aspects, such as the entrepreneurs' work experience, socio-demographic status and other dimensions of individual characteristics.

The Kaplan-Meier survival curves for business takeovers and matched new venture start-ups are illustrated in Figure 4-2. It is shown that the curve representing the survival function of new venture start-ups (dashed curve) shifts upwards, indicating that the discrepancy between new venture start-ups and takeovers regarding their survival rates narrows after the propensity score matching approach is implemented.

Table 4-1 presents the t-test between the matched new venture start-up sample and the takeover sample. Comparing the survival rate for new venture start-ups before and after matching, one can observe an increase from 0.55 to 0.58, which is no longer statistically different from the survival rate for takeovers. Moreover, the gap between survival months for new venture start-ups and business takeovers narrows from 4.55 to 3.23 months, though the difference is still significant.

Furthermore, the means of a set of independent variables, such as *small*, *medium* and *large firm experience*, are statistically indifferent between the takeover sample and the *matched* new venture start-up sample. Nevertheless, some variables remain different between the two samples. A perfect match is hard to achieve since this study uses multiple covariates as criteria in the propensity score matching approach to select a subsample. However, even if t-tests of some variables still show sample differences, the means of the *matched* sample approximate the means of the takeover sample. For instance, before matching, only 25% of new venture start-ups were founded with over 16,000 euro as start-up capital (whereas the proportion for business takeovers was 77%); but, after matching, this proportion increases to 73%. The changes of means and t-test results before and after propensity score matching imply that the matching is effective in removing or eliminating sample differences.

Table 4-2 presents two Cox regressions featuring all new firms before and after matching. A dummy variable *business takeover* (dummy=1) is included in the models to capture the impact of entrepreneurship path on firms' exit risk. The estimation result of the first model using an unmatched full sample shows that business takeovers are 8% less likely to exit than new venture start-ups (hazard ratio=0.92, $p<0.01$), suggesting a strong difference between these two types of entrepreneurship regarding their survival chances. However, the variable *business takeover* is insignificant in the second model, which is based on a sample of takeovers and matched new venture start-

ups. This implies that business takeovers no longer outlive new venture start-ups, if the differences among the two types of entrepreneurs are under control.

Figure 4-1: Kaplan-Meier survival estimates by entrepreneurship paths (before matching)

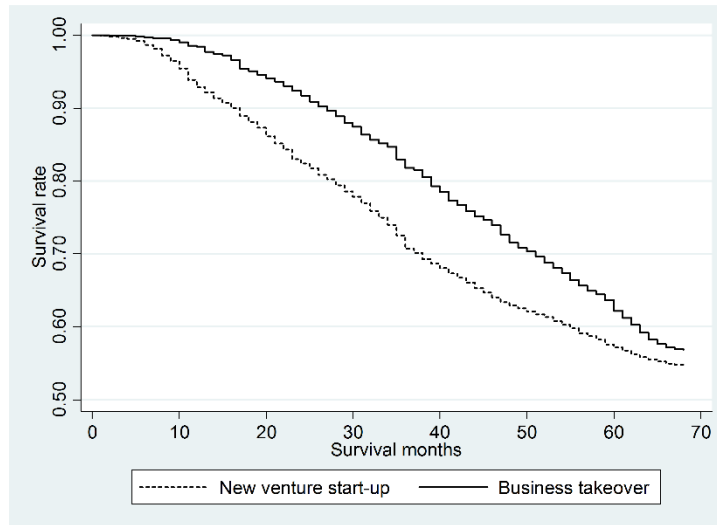


Figure 4-2: Kaplan-Meier survival estimates by entrepreneurship paths (after matching)

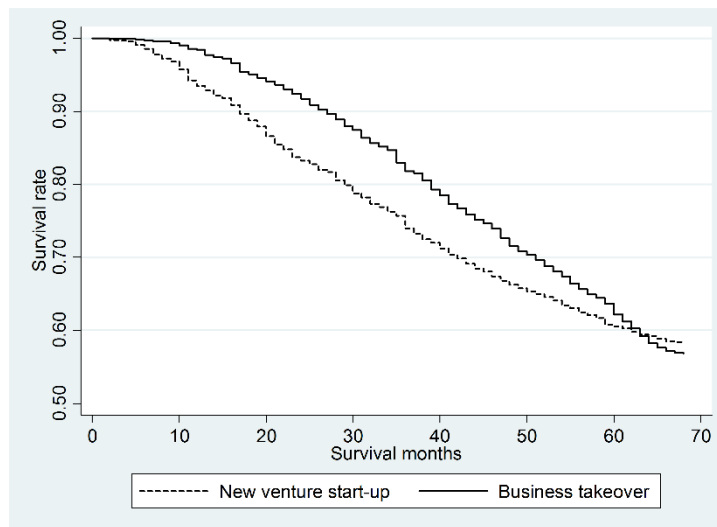


Table 4-2: Unmatched full sample vs. matched full sample

	Unmatched full sample	Matched full sample
	Cox regression	Cox regression
	Hazard ratio	Hazard ratio
<i>Entrepreneurship entry mode</i>		
Business takeover	0.92** (0.03)	0.98 (0.04)
<i>Type of work experience</i>		
Benchmark: small firm experience		
Medium firm experience	0.97 (0.03)	1.05 (0.07)
Large firm experience	1.02 (0.02)	0.97 (0.06)
Management experience	0.89*** (0.02)	0.88* (0.05)
Same sector experience	0.82*** (0.01)	0.70*** (0.03)
<i>Educational attainment</i>		
Benchmark: no diploma		
Lower than A-level diploma	0.88*** (0.02)	0.84*** (0.04)
A-level diploma	0.82*** (0.02)	0.83** (0.05)
A-level plus two years of education	0.79*** (0.03)	0.70*** (0.05)
A-level plus over two years of education	0.66*** (0.02)	0.53*** (0.04)
Received entrepreneurial training	0.93*** (0.02)	0.85*** (0.03)
<i>Entrepreneurial motivation and ambition</i>		
Full-time entrepreneurship	0.97 (0.02)	0.89* (0.05)
Benchmark: necessity motivation		
Motivation: opportunity	0.98 (0.05)	0.73 (0.15)
Motivation: mix of opportunity and necessity	1.16** (0.06)	0.88 (0.18)
Growth ambition	1.13*** (0.02)	1.07 (0.04)
Long-term entrepreneurship	0.60*** (0.02)	0.50*** (0.03)
<i>Support for the entrepreneur</i>		
Entrepreneurs in close relational circle	0.96* (0.02)	0.99 (0.04)
Received social benefit	1.13*** (0.04)	1.16 (0.09)
Sole entrepreneur	1.14*** (0.02)	1.11** (0.04)

Notes: Exponentiated coefficients are presented; standard errors are in the parentheses. Hazard ratio is an estimate of risk. If the hazard ratio falls below one, it means that the corresponding variable reduces the failure risk of firm survival, namely it contributes to firm survival; otherwise, it endangers firm survival. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4-2 (continued): Unmatched full sample vs. matched full sample

	Unmatched full sample	Matched full sample
	Cox regression	Cox regression
	Hazard ratio	Hazard ratio
<i>Socio-demographic status</i>		
Benchmark: age under 35		
Age between 35 and 49	0.86*** (0.02)	0.86*** (0.03)
Age over 50	0.91*** (0.03)	0.82** (0.06)
Female	1.03 (0.02)	1.01 (0.04)
French	0.83*** (0.02)	0.90 (0.06)
<i>Firm's characteristics</i>		
Benchmark: no innovation		
Product innovation	0.99 (0.02)	0.93 (0.04)
Process innovation	0.98 (0.03)	0.95 (0.07)
Organizational innovation	1.03 (0.02)	0.94 (0.04)
Benchmark: start-up capital: <2k		
Start-up capital: 2-16k	0.85*** (0.02)	1.31 (0.18)
Start-up capital: 16-80k	0.75*** (0.02)	1.23 (0.17)
Start-up capital: >80k	0.63*** (0.02)	1.03 (0.15)
Received public aid	0.99 (0.02)	1.02 (0.04)
Percentage of self-funding	1.07** (0.02)	1.02 (0.06)
Urban	1.18*** (0.02)	1.13*** (0.04)
N entrepreneurs	34,872	7,516
Log pseudolikelihood	-159,168.52	-27,425.68
Wald chi2	1,866.94***	518.49***

Notes: Exponentiated coefficients are presented; standard errors are in the parentheses. Hazard ratio is an estimate of risk. If the hazard ratio falls below one, it means that the corresponding variable reduces the failure risk of firm survival, namely it contributes to firm survival; otherwise, it endangers firm survival. Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001.

4.4.2 How do survival determinants differ between takeovers and new venture start-ups?

This section analyzes the impact of a set of independent variables on the survival probability of new venture start-ups and takeovers using the Cox proportional hazards model. Table 4-3 reports the estimation results based on three subsamples: the original new venture start-up sample (model I), the matched new venture start-up sample (model II) and the takeover sample (model III). Moreover, two Chow tests are conducted to contrast the estimates of model III to the estimates of model I and model II, respectively. Industry dummies are significant in all three models, implying that cross sector differences exist.

The comparison of model I and model III reveals some differences among a number of variables regarding their impact on the survival probability of new venture start-ups and takeovers. In line with what is found in Table 4-2, entrepreneurs' *same sector experience* reduces the risk of failure for both new and acquired businesses.¹⁵ However, such experience is more effective in preventing exit for takeovers than for new venture start-ups. Similarly, the positive impact of a *long-term vision* on firm survival is larger for business takeovers than for new venture start-ups. At the firm-level, *organizational innovation* increases the mortality risk for new venture start-ups, but does not affect takeovers. Moreover, *start-up capital* significantly extends new venture start-ups' survival time: the greater the amount of start-up capital, the lower the risk of failure. In contrast, takeovers' exit probability is enhanced if their start-up capital is higher, although this impact is statistically insignificant. Furthermore, surprisingly, *public aid* does not help prolong acquired firms' lives; instead, *public aid* significantly increases their mortality rate.

In the next step, this study compares the survival determinants between the matched new venture start-up sample (model II) and the takeover sample (model III). The Chow test results show that most independent variables affect the survival chances of new venture start-ups (matched) and business takeovers in similar ways. For example, *educational attainment* has a positive impact on the survival chances of both types of entrepreneurship, even though the effect is not significant for individuals who hold an A-level or lower than A-level degree in the matched new venture start-up sample. Also, *same sector experience* and *long-term entrepreneurship* contribute to the survival of both newly founded firms and acquired firms. Moreover, *middle-aged entrepreneurs* (between 35 and 49 years old) are more successful than their younger counterparts, irrespective of business

¹⁵ Due to a large sample size, this study only considers the Chow test p-value at 5% significance level.

types. Furthermore, both new venture start-ups and takeovers located in *urban* areas are more likely to exit than those that reside in rural areas.

However, three variables affect the survival of new venture start-ups (matched) and takeovers in different ways. First, using *small firm experience* as a benchmark, *medium firm experience* leads to a higher likelihood of exit for new venture start-ups. In other words, principal work experience accumulated through working in a *small firm* preceding entrepreneurship helps new venture creators to successfully run their businesses. However, this effect is insignificant for entrepreneurs who take over an established firm. Regarding *entrepreneurial motivation*, new firm creators who are motivated by exploiting business opportunities or by a mixed incentive consisting of opportunity seeking and life constraint are more successful than those who are forced into entrepreneurship. Meanwhile, opportunity-related motivations have no impact on business takeovers' survival chances. With respect to *received public aid*, this study finds that it is negatively related to business takeovers' survival rates.

A summary of the results comparing model II and model III is presented in Table 4-4.

Table 4-3: Unmatched and matched new venture start-up vs. business takeover

	New venture (unmatched)	New venture (matched)	Takeover	Chow test	Chow test
	Hazard ratio	Hazard ratio	Hazard ratio	p-value	p-value
	Model I	Model II	Model III	I vs. III	II vs. III
<i>Type of work experience</i>					
Benchmark: small firm experience					
Medium firm experience	0.97 (0.03)	1.29** (0.11)	0.87 (0.08)	0.328	0.002
Large firm experience	1.02 (0.03)	0.97 (0.09)	0.99 (0.08)	0.751	0.841
Management experience	0.89*** (0.02)	0.90 (0.07)	0.92 (0.07)	0.636	0.799
Same sector experience	0.84*** (0.02)	0.73*** (0.04)	0.69*** (0.04)	0.005	0.763
<i>Educational attainment</i>					
Benchmark: no diploma					
Lower than A-level diploma	0.90*** (0.02)	0.90 (0.07)	0.79** (0.06)	0.136	0.315
A-level diploma	0.83*** (0.03)	0.89 (0.08)	0.78** (0.07)	0.582	0.334
A-level plus two years of education	0.80*** (0.03)	0.68*** (0.08)	0.75** (0.08)	0.762	0.369
A-level plus over two years of education	0.68*** (0.02)	0.56*** (0.07)	0.59*** (0.08)	0.399	0.568
Received entrepreneurial training	0.95* (0.02)	0.92 (0.05)	0.85** (0.05)	0.073	0.386
<i>Entrepreneurial motivation and ambition</i>					
Full-time entrepreneurship	0.97 (0.02)	0.82* (0.07)	0.88 (0.08)	0.280	0.503
Benchmark: necessity motivation					
Motivation: opportunity	0.98 (0.05)	0.45** (0.11)	1.21 (0.41)	0.513	0.013
Motivation: mix of opportunity and necessity	1.16** (0.06)	0.58* (0.15)	1.30 (0.45)	0.766	0.050
Growth ambition	1.14*** (0.02)	1.08 (0.06)	1.05 (0.06)	0.093	0.610
Long-term entrepreneurship	0.61*** (0.02)	0.52*** (0.04)	0.47*** (0.04)	0.032	0.941
<i>Support for the entrepreneur</i>					
Entrepreneurs in close relational circle	0.96* (0.02)	0.97 (0.05)	1.05 (0.06)	0.113	0.324
Received social benefit	1.14*** (0.04)	1.22 (0.13)	1.07 (0.13)	0.449	0.316
Sole entrepreneur	1.14*** (0.02)	1.07 (0.06)	1.16** (0.06)	0.908	0.401

Notes: In the above Cox regression model, exponentiated coefficients are presented; standard errors are in the parentheses. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4-3 (continued): Unmatched and matched new venture start-up vs. business takeover

	New venture (unmatched)	New venture (matched)	Takeover	Chow test	Chow test
	Hazard ratio	Hazard ratio	Hazard ratio	p-value	p-value
	Model I	Model II	Model III	I vs. III	II vs. III
<i>Socio-demographic status</i>					
Benchmark: age under 35					
Age between 35 and 49	0.87*** (0.02)	0.88* (0.05)	0.82*** (0.05)	0.436	0.460
Age over 50	0.91** (0.03)	0.83 (0.09)	0.82 (0.09)	0.380	0.961
Female	1.03 (0.02)	0.98 (0.06)	1.07 (0.06)	0.542	0.296
French	0.82*** (0.02)	0.90 (0.09)	0.91 (0.09)	0.230	0.861
<i>Firm's characteristics</i>					
Benchmark: no innovation					
Product innovation	1.00 (0.02)	1.00 (0.06)	0.96 (0.06)	0.558	0.637
Process innovation	0.99 (0.03)	1.03 (0.10)	0.90 (0.10)	0.381	0.374
Organizational innovation	1.05* (0.03)	0.96 (0.07)	0.90 (0.06)	0.033	0.602
Benchmark: start-up capital: <2k					
Start-up capital: 2-16k	0.84*** (0.02)	1.12 (0.23)	1.34 (0.26)	0.009	0.574
Start-up capital: 16-80k	0.73*** (0.02)	0.98 (0.21)	1.27 (0.24)	0.002	0.386
Start-up capital: >80k	0.58*** (0.03)	0.69 (0.15)	1.17 (0.23)	0.000	0.068
Received public aid	0.97 (0.02)	0.93 (0.06)	1.15* (0.07)	0.006	0.014
Percentage of self-funding	1.05* (0.02)	1.00 (0.08)	1.17 (0.11)	0.219	0.219
Urban	1.19*** (0.02)	1.13* (0.06)	1.18** (0.06)	0.672	0.693
N entrepreneurs	31,114	3,758	3,758	34,872	7,516
Log pseudolikelihood	-141,086.46	-12,371.75	-12,783.79		
Wald chi2	1,671.30***	285.12***	340.90***		

Notes: In the above Cox regression model, exponentiated coefficients are presented; standard errors are in the parentheses. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4-4: A summary of the main findings in this chapter

	New venture start-up (matched)	Business takeover
<i>Type of work experience</i>		
Benchmark: small firm experience		
Medium firm experience	-	ns
Same sector experience	+	+
<i>Educational attainment</i>		
Benchmark: no diploma		
Lower than A-level diploma	ns	+
A-level diploma	ns	+
A-level plus two years education	+	+
A-level plus over two years education	+	+
<i>Entrepreneurial motivation and ambition</i>		
Benchmark: necessity motivation		
Motivation: opportunity	+	ns
Motivation: mix of opportunity and necessity	+	ns
Long-term entrepreneurship	+	+
<i>Socio-demographic status</i>		
Benchmark: age under 35		
Age between 35 and 49	+	+
<i>Firm's characteristics</i>		
Received public aid	ns	-
Urban	-	-

Notes: “+” indicates a positive impact on firm survival; “-” indicates a negative impact on firm survival.

4.5 Discussion

This study attempts to answer two research questions. The first concerns whether business takeovers and new venture start-ups differ with respect to their survival rates. The second question relates to how the survival determinants of business takeovers and new venture start-ups are distinguished from each other. In particular, this research analyzes the individual-level and firm-level characteristics that influence the survival probability of takeovers and new venture start-ups.

In accordance with previous literature, this study shows that business takeovers have a higher survival rate and exist longer than new venture start-ups (Bates, 1990; Dyke et al., 1992). Takeovers have already passed through the initial stage of start-up, while newly founded firms, as new competitors in the market, bare higher mortality risk (Block et al., 2013b; Dyke et al., 1992). Whereas new venture creators typically struggle to reach their customers, business acquirers begin their entrepreneurship with resources already in place, most likely including production line, business relationship with suppliers and a customer base (Bastié et al., 2013; Bates, 1990). The differences between business takeovers and new venture start-ups as entrepreneurial paths create a sorting effect on the individuals who pursue these two types of entrepreneurship. This is reflected by the finding that business creators and business acquirers have distinctive work and life experiences, and that they differ in several socio-demographic aspects. Furthermore, significant differences can be found in the initial investment of business takeovers and new venture start-ups, with the former requiring a larger amount of start-up capital than the latter.

However, after controlling for entrepreneurs' differences across various dimensions by using propensity score matching approach, the survival rate for takeovers is no longer different to that of new venture start-ups. In other words, new venture creators and business acquirers are indistinguishable when it comes to keeping businesses alive, so long as they have had similar employment paths, life experiences and socio-demographic status. This finding seems at first sight to be contradictory to the former result, which shows business acquirers are more successful than new venture creators; however, it should be noted that this result holds only for entrepreneurs with similar characteristics and background.

Moreover, this study analyzes the second research question by contrasting the survival determinants of new venture start-ups with those of business takeovers. The empirical findings reveal some common factors that influence the survival rate of both types of entrepreneurship. First, an

entrepreneur's same sector experience and educational attainment contribute to the survival of new venture start-ups and takeovers. This result is in line with previous findings, which argue that highly educated individuals have greater capability to run new firms, such as the ability to discover and exploit business opportunities and to solve difficult problems (Bates, 1990; Boyer and Blazy, 2014; Cooper et al., 1994; Ganotakis, 2012; Gimeno et al., 1997). Also, this finding is in line with industry knowledge literature that shows that an entrepreneur's industry-specific experience helps one to identify risks and market opportunities (Bosma et al., 2004; Boyer and Blazy, 2014; Gimeno et al., 1997). Second, age has a positive impact on firm survival only if the entrepreneur is middle aged, between 35 and 49 years old. Preisdörfer and Voss (1990) discover an inverted u-shaped pattern for founder's age and new firm survival: younger and older entrepreneurs are more likely to exit, whereas middle-aged entrepreneurs persist longer. This study argues that on one hand, middle-aged entrepreneurs are, on average, more likely to accumulate business experience and network necessary to sustain a firm than younger entrepreneurs; on the other hand, they are less risk averse than older individuals who are less likely to invest in risky yet profitable projects (Caliendo et al., 2010). Third, entrepreneurs with long-term orientation are more likely to remain in entrepreneurship activities, suggesting that an entrepreneur's motivation and ambition towards his or her business can determine its length of survival. Finally, firms located in urban areas are more likely to exit than firms in rural areas. This finding contradicts the prediction that urban firms are more successful because human capital and financial resources are more abundant in these areas (Stearns et al., 1995). Instead, the results support the argument that competition is very intense in highly advanced and diversified areas, and that the ample business opportunities available in urban markets reduces the exit cost for entrepreneurs, thus allowing them to pursue alternative possibilities with fewer negative consequences than their rural counterparts (Headd, 2003).

Furthermore, this study identifies three survival determinants that influence the risk of failure for business takeovers and comparable new venture start-ups (matched sample) in distinctive ways. First, an entrepreneur's work experience from small firms rather than from medium firms increases the likelihood of survival for new venture start-ups, but does not affect business takeovers. Elfenbein et al. (2010) find that small firms generate more entrepreneurs than large firms, and that these entrepreneurs earn more at the initial stage of entrepreneurship than their counterparts from large firms. This positive effect of small firm experience on entrepreneurial intention and success is explained by Gompers et al. (2005), who adopt the perspective of a firm's inner environment.

They argue that small firms' straightforward corporate structure and limited number of employees enable people to network with the founders, suppliers, customers and even competitors, which helps them develop a network that favors subsequent entrepreneurship. Another argument draws from the jack-of-all-trades theory proposed by Lazear (2005). Small firm employees are likely to build a broad range of abilities and skills because they are usually assigned multifaceted tasks (Hyytinen and Maliranta, 2008). A balanced set of skills may help an entrepreneur to safeguard the business through turbulent times, thus increasing the firm's survival chances (Elfenbein et al., 2010; Stuart and Abetti, 1990). To explain the finding that small firm experience contributes to the survival probability of new venture start-ups, this study argues that small firm experience is more useful in small-scale start-ups, where the context is similar to the entrepreneur's former working environment, whereas in acquired firms, specialized knowledge and skills may be more valuable.

Second, the finding that new firm creators who are driven by the pursuit of business opportunities or by a mixed motivation based on opportunity exploitation and life constraint are more successful than those who are unwillingly pushed into entrepreneurship suggests that self-motivation or initiative is a success factor for new venture start-ups. This conclusion is in line with the finding of Gimeno et al. (1997), who show that intrinsically motivated entrepreneurs are less likely to exit, because they care about the non-financial aspects of entrepreneurship. Likewise, Binder and Coad (2013) find that entrepreneurs who voluntarily pursue entrepreneurial activities are more satisfied with their lives than entrepreneurs who choose to create a new firm to avoid unemployment. This study argues that the success of opportunity-driven entrepreneurs can be ascribed to their capability to identify lucrative opportunities and their willingness to maintain their businesses long term (Block and Wagner, 2010; Gimeno et al., 1997). In contrast, this study does not find a link between opportunity motivation and the survival rate of takeovers, suggesting that the survival chances of purchased firms are independent of entrepreneurial motivation. This study argues that business acquirers benefit from the establishments of the acquired firms, whose size advantage and accumulated resources may outweigh the entrepreneurs' motivation in determining firm survival.

Third, the negative association between takeovers' receiving public aid and their survival chances exposes an inefficiency in the public aid system, specifically in terms of helping business takeovers persist. Entrepreneurship is widely regarded as an economic stimulator by authorities, and financial aid is given at both the national and local levels to support a range of entrepreneurial

activities. For example, the French national funding scheme ACCRE is set up to support unemployed people to start a new business. The finding that public aid does not prolong the lives of business takeovers, but rather increases their exit rate, stresses the importance of separating takeover entrepreneurs from start-up entrepreneurs, and of providing both groups with tailored support programs.

4.6 Conclusion

This research proposes two questions and answers them using a large sample of new venture start-ups and takeovers. First, it shows that business acquirers are less likely to exit than new venture creators. Furthermore, this study analyzes the survival determinants of new venture start-ups and takeovers by using two equal-sized samples that are analogous to each other. The findings reveal that former employer size, entrepreneurial motivation and firm's receipt of public aid affect the survival rates of business takeovers and new venture start-ups differently.

This analysis extends our knowledge on new firm survival by revealing the differences between business takeovers and new venture start-ups. Previous studies on firm survival either focus on newly founded firms (e.g., Boyer and Blazy, 2014; Brüderl et al., 1992; Headd, 2003) or treat business takeover as a moderating effect on firm survival (De Jong and Marsili, 2015). However, this study shows that these two types of entrepreneurship attract individuals with different characteristics and attributes, and their survival probabilities differ accordingly.

Furthermore, this study shows that business takeovers and new venture start-ups are similarly affected by a set of individual-level and firm-level characteristics, while discrepancies still exist among entrepreneurs' small firm experience, entrepreneurial motivation and firms' receipt of public aid. The findings of this research enrich the literature on small firm effect by showing that small firm experience is more productive in new venture start-ups than in takeovers (Elfenbein et al., 2010; Gompers et al., 2005). Furthermore, this study amplifies the dichotomous categorization of opportunity and necessity entrepreneurship by incorporating a third type of entrepreneurship that captures individuals who have mixed entrepreneurial motivations (Baptista et al., 2014; Block and Wagner, 2010).

This study also has policy implications. First, entrepreneurial training courses that inspire individuals to seek opportunities may not be helpful in keeping acquired firms alive. Instead, professional knowledge needed during the business transfer process and for the further development

of businesses may be more desirable for business acquirers. Therefore, policy makers should distinguish business acquirers from new venture creators, and offer suitable programs specifically designed for each type of entrepreneur. Second, this study points out a negative effect of public aid on extending the lives of takeovers, as well as the insignificance of public aid on new venture start-ups' survival chances, suggesting that authorities should carefully reevaluate their financial aid policies towards entrepreneurial activities.

Finally, this study is not without limitations. First, Wennberg et al. (2010) show that human capital exhibits disparate impacts on firms that are in either good or bad financial situations before being sold or liquidated. Unfortunately, the data set used in this study cannot identify entrepreneurs' reasons for exit; therefore, it is uncertain about whether an entrepreneur deregisters the firm due to bankruptcy or individual reasons, such as retirement, even if the firm still performs well. Further research should distinguish among various exit reasons in order to better define "firm survival". Second, this study considers success factors at the initial stage of entrepreneurship, but some factors that vary over time or occur during the observation period may play a role in determining a firm's survival chance. For instance, a renewable energy start-up may benefit financially from new tax reduction policy for renewable energy industry, thereby increasing its survival probabilities. The exploration of firm survival should be extended to include time-varying factors to capture a dynamic influence on the survival chances of takeovers and new venture start-ups (Audretsch and Mahmood, 1995).

5 Management succession in family firms

The number of family firms worldwide is unclear due to the difficulty of defining what constitutes a family firm. Scholars have provided some estimations on the scale of family firms in proportion to global economy. La Porta et al.'s (1999) study on the ownership structure of publicly listed firms from 27 countries shows that approximately 35% of large firms and 53% of medium-sized firms are family controlled. Shanker and Astrachan (1996) estimate that family firms contribute to between 20% and 40% of the US GDP, and account for between 15% and 59% of the US work force. In Europe, family firm is the most common legal form of business. According to an IFERA report (2003), the percentage of family firms in EU countries are greater than 60% in France, 60% in Germany, and 70% in the United Kingdom. The prosperity of family firms worldwide is closely related to successful generation-to-generation succession (Berrone et al., 2012; Klein et al., 2005). However, previous research shows that only one-third of family firms are successfully transferred to the second generation, and only a small percentage of them can survive through the third generation (Kets de Vries, 1993; Morris et al., 1997). The hardship of family firm succession draws attention from academic scholars. In Chua et al.'s (2003) study, "succession" is the most studied topic in family business research field between 1997 and 2003, with 19.5% of research papers and notes focusing on this issue.

Of all subtopics regarding family firm succession, management succession is critical to family firm continuity. Family firms can choose managers from professionally trained outsiders or among family members (e.g., Dyer, 1989; Lee et al., 2003; Vandekerckhof et al., 2015). In the book of Kets de Vries (1996), the author introduces a succession case that can best describe the dilemma a family firm faces and its significant influence on a firm's performance and survival. In this case, the founder of a Canadian grocery store, Mr. Steinberg, chose a new CEO from among his son-in-law, a few nonfamily executives, and outside managers. The first choice was made upon kinship rather than ability; hence, the son-in-law was selected. Unfortunately, this family successor failed to maintain the business and was forced to resign. Afterwards, an outside professional manager was chosen, but his contract did not last long due to the lower profitability of the grocery store. Finally, the Steinberg family chose one of its long-time employees to take over the management position, who succeeded in turning the loss of the business into profit.

In light of the importance of management succession in family firms, this chapter provides a relevant literature review that lays out a foundation for further analysis in Chapter 6. This chapter has three subsections. First, it presents a summary of family firm definitions that are used in previous research, and then proposes the definition that will be used in the next chapter. Second, this chapter articulates the content of economic and non-economic goals in family firms, the relationship between them, and the influence they impose on family firm behavior. Third, a discussion is presented to explain differences between family managers and nonfamily managers, as well as factors that determine the hiring decision between these two manager types.

5.1 Definition of family firm

Unlike nonfamily firms that are owned by a single or a group of institutions, funds, or dispersed shareholders who are connected by legal relationship, family firms are in the hands of a group that is bonded by family kinship. A significant characteristic of family firms is that families have strong influences on the firm and can exert influence through ownership or management (Klein et al., 2005). The definition of family firm shall reflect such a characteristic so that family firms can be clearly differentiated from nonfamily firms.

Klein et al. (2005) propose an F-PEC model as an integral frame to define family business, which displays how the family exerts influence on the firm through various channels. In this model, P stands for power, which is exerted by the family through family ownership, family management, and family board; E represents experience, which is accumulated through passing the family firm to the next generation; C represents culture, which reflects the family's value and commitment. These three dimensions are interrelated: the family exerts its influence on a firm's strategic decisions, behavior, and performance through the power dimension. This power is maintained and strengthened through ownership and/or management succession within the family. Moreover, family culture is a family's shared vision and values that tie them together for the purpose of safeguarding the family firm through generations.

The power dimension of family influence summarized by Klein et al. (2005) is commonly used to define family firms. Accordingly, family firms are defined by the percentage of stock shares owned by the family (family ownership), whether the CEO is a family member (family management), or whether a family member is present in the board (family control). The widely implemented definition of family firm is the percentage of ownership controlled by the family. However,

the threshold that is utilized is not consistent throughout previous studies. Some papers use a low benchmark, e.g., 5% of the firm's voting share is owned by the family (e.g., Berrone et al., 2010; Block, 2012), while others use a high benchmark of 50% (e.g., Westhead and Howorth, 2006, 2007). More often, scholars combine two or even three aspects of the power dimension to define family firms (e.g., Anderson and Reeb, 2003; Ansari et al., 2014; Maury, 2006; Villalonga and Amit, 2006).

In light of the difficulties of defining family firms on an operational level, Chua et al. (1999) propose a theoretical definition of family firm that sheds light on the definition and the categorization of a family firm both in research and in practice. They define family business as “a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families” (Chua et al., 1999, p. 25). This definition includes three crucial elements: dominant coalition, intention for succession, and family vision. This indicates that a firm that is managed, but not owned, by a family can also be identified as a family firm, if the family controls the dominant coalition and uses the firm to pursue its family vision. Moreover, a founder-owned firm is a family firm if the founder intends to transfer the business to the next generation. Chrisman et al. (2004) and Chrisman et al. (2009) operationalize this theoretical family firm definition by defining family firms with respect to the percentage of family ownership, the number of family managers, and the intention of intra-family succession.

This chapter adopts the theoretical definition of family firms proposed by Chua et al. (1999), and defines family firm as a firm owned by a business founder or a business-owning family who intends to pass the family business down to the next generation.

5.2 Economic and non-economic goals in family firms

Tagiuri and Davis's (1992) survey on successful family firms shows that “make profit now” is the most frequently reported goal of family firms.¹⁶ In family firm literature, agency theory and resource-based views are used to understand family firm strategy, behavior, and performance. Both of these theories are based on an implicit assumption that the family firm's goal is to maximize its

¹⁶ The results of Tagiuri and Davis (1992) may be slightly biased because they study only successful family firms, which are more likely than unsuccessful family firms to focus on profitability.

economic value (Chrisman et al., 2005). Admittedly, the nature of business, whether it is family-owned or not, is to survive and to make profit. In this regard, family firms are no different from nonfamily firms (Lee and Rogoff, 1996). In fact, economic goals are of great relevance and importance for family firm continuity and firm succession (McKenny et al., 2012). In terms of the content of economic goals, they vary from market-based performance, such as stock price, to accounting-based performance, such as ROA and sales growth. Thanks to numerical data, family firms can predict the success probability of fulfilling economic goals, evaluate to what extent the goals are met, and adjust strategies accordingly to attempt to reach the economic goals.

However, behavior theory suggests that firms have both economic and non-economic goals. Non-economic goals reflect a firm's vision, attitude, and value (Cyert and March, 1963). Family firms, in particular, can choose to pursue the family's non-economic goals (Chrisman et al., 2004; Chrisman et al., 2012; Corbetta and Salvato, 2004; Lee and Rogoff, 1996). For instance, Lee and Rogoff (1996) show that the goal of starting a business for some family firm founders is not to simply earn money, but to create something that can be given to their families. The business-owning family's non-economic goals are multifaceted and can include family harmony, family social status, family identity linkage, philanthropy, environmental preservation, and emotional value (Chrisman et al., 2005; Chrisman et al., 2012; Zellweger and Astrachan, 2008). Moreover, the value of the non-economic goals in family firms is referred to as socioemotional wealth (SEW) by Gómez-Mejía et al. (2007), who define SEW as "non-financial aspects of the firm that meet the family's affective needs, such as identity, the ability to exercise family influence, and the perpetuation of the family dynasty" (p. 106). That is, the non-economic goals are shaped by the family who are in pursuit of its interest, reflect family members' identification and commitment to the firm, the family's dominant control over its business, and its ability to transfer the business to the next generation (e.g., Berrone et al., 2012; Chua et al., 1999). By definition, non-economic goals are intangible values that are closely related to the family, and difficult to track and measure quantitatively.

Because family firms pursue both economic and non-economic goals, the total value of a family firm is composed of financial value and SEW (Astrachan and Jaskiewicz, 2008). The conceptualization of non-economic goals and SEW has helped to understand family firm behavior (Westhead and Howorth, 2007). It is shown that the preservation of SEW in family firms has an impact on firm's proactive stakeholder engagement strategy (Cennamo et al., 2012), environment

policy (Berrone et al., 2010), acquisition decision (Gómez-Mejía et al., 2015), earnings management (Stockmans et al., 2010), and research and development (R&D) investment (Chrisman and Patel, 2012). Moreover, family firms cherish their SEW so much that they are willing to preserve SEW at the cost of the firm's financial performance (Gómez-Mejía et al., 2007), and when the family sells the business to nonfamily members, they would charge a premium to compensate for the loss of SEW (Zellweger et al., 2012).

The relationship between economic goals and non-economic goals in family firms can be negative. Many previous studies suggest this (Berrone et al., 2010; Gómez-Mejía et al., 2007; Stockmans et al., 2010), but it can also be positive (Kabbach de Castro et al., 2016). Chrisman and Patel (2012) find that family goals are aligned with the firm's economic goals when family owners are more long-term oriented or when the firm's financial performance is below its aspiration level. In the former case, the family posits a long-term view for the firm and takes more risks in investing in R&D projects. In the latter case, economic goals are prioritized over non-economic goals to assure the survival and continuity of family firms. Moreover, drawn from the study of Berrone et al. (2012), which decomposes SEW into five dimensions, Martin and Gómez-Mejía (2016) propose a conceptual framework to examine the relationship between a family firm's financial performance and each of the five dimensions of SEW. In their study, a family firm's economic and non-economic goals can be substitutes or complements, contingent on the specific dimension of SEW as well as socioemotional benefits and costs. For instance, family firms would likely invest in projects that can bring a positive financial outcome if such an investment increases the net value of SEW as well.

5.3 A nonfamily manager versus a family manager

Previous studies on whether it is more profitable to hire family or nonfamily managers have given inconsistent results. Whereas some studies find a positive impact of family management on firm performance (Anderson and Reeb, 2003; Maury, 2006), others show that nonfamily managers are more successful (Bennedsen et al., 2007; Bloom and Van Reenen, 2007; Pérez-González, 2006). However, there are also articles that report an insignificant association between family management and firm performance (Wagner et al., 2015; Westhead and Howorth, 2006). More recent studies reconcile these controversies by investigating contingencies that affect the relationship between family management and firm performance. Villalonga and Amit (2006) show that founder-

CEOs are superior at creating firm value, while descendant-CEOs are not. Miller et al. (2013) find that the influence of a family CEO on firm performance is positive if the family firm is smaller and the ownerships are concentrated, otherwise the impact will be negative. Moreover, Minichilli et al. (2010) find a U-shape relationship between the proportion of family members in the top management team (TMT) and firm performance. This suggests that a mediate ratio of family/nonfamily managers in TMT can cause divide and faction, thereby hurting firm performance.

The influence of family managers or nonfamily managers on firm performance remains muddled. Arguably, both family and nonfamily managers have advantages and disadvantages for running a family firm. First, nonfamily managers are chosen from a larger sample pool of candidates who usually have a track record of professional success as reflected by a formal educational degree, managerial experience, and former employer performance (Dyer, 1989; Block, 2011). They are likely to be more competent than family managers regarding managerial ability and skills (Burkart et al., 2003; Pérez-González, 2006), and hiring them can bring outside resources such as business networks and financial capital into family firms (Sonfield and Lussier, 2009). Second, nonfamily employees in family firms perceive recruitment or promotion of family members as unfair. This perception of injustice is worsened when the level of family influence increases (Barnett and Kellermanns, 2006; Padgett and Morris, 2005). Hence, hiring a nonfamily manager can avoid issues like nepotism (Padgett and Morris, 2005) and expropriation (La Porta et al., 1999) that may jeopardize firm performance. Third, choosing a nonfamily manager may be the only choice for some family firms when they cannot find a qualified candidate from within the family to take over management responsibility, either because the family candidates do not have the capability and skills to run the business, or because none of the family members have interest in working in the family firm (Dyck et al., 2002; Dyer, 2006; James, 1999).

A counterargument against the preference for nonfamily managers draws from agency theory. According to Jensen and Meckling (1976) and Chrisman et al. (2004), agency cost occurs when the manager (agent) does not act in the interest of the family (principal). By hiring a family manager, agency cost can be reduced, because adverse selection and moral-hazard issues can be mitigated. Family firms select nonfamily managers based on their work performance in previous employer firms. Yet, the true ability, personality, and objective of the nonfamily manager are unknown to the family firm (Chua et al., 2003). In this regard, family firms cannot predict a nonfamily manager's behavior. As a result, agency conflict may arise if the manager deviates from what the

family firm expects him or her to do. Family firms have difficulties monitoring a nonfamily manager's effort and behavior. A moral-hazard problem occurs in this scenario wherein nonfamily managers may act opportunistically at the expense of the family firm's benefits (Chrisman et al., 2004). On the contrary, moral-hazard is less of an issue when a family member is appointed as the new manager, because family managers, referred to as *stewards*, align their objective with the family and act in the interest of the family firm (Davis et al., 1997; Chrisman et al., 2004; Chrisman et al., 2012; Schulze et al., 2003).

The decision of whether to hire a family or nonfamily manager is influenced by external factors such as culture and economy (e.g., Ansari et al., 2014), as well as internal factors such as family influence, firm size, the availability of family candidates, and intention for transgenerational succession (e.g., Lee et al., 2003; Memili et al., 2013; Vandekerckhof et al., 2015). Large, innovative, and international family firms require managers that are competent, professional, and experienced. Therefore, these family firms prefer to include nonfamily managers in the top management team (Vandekerckhof et al., 2015). In contrast, family firms with transgenerational intention and strong family influence tend to keep the management power within the family (Memili et al., 2013). Lee et al. (2003) argue that family firms with highly idiosyncratic knowledge, that is, "a form of human-specific asset that arises from learning by doing" (p. 658), prefer family managers, regardless of their lower level of competence. In addition, large firms are more likely to hire nonfamily CEOs because these firms are capable of institutionalizing idiosyncratic knowledge by using their resources (Lee et al., 2003).

As Section 5.2 articulates, family firms pursue both economic goals and non-economic goals (Chrisman et al., 2012). These goals influence a manager's behavior, and will consequently affect a family firm's decision to choose between a family and nonfamily manager. For nonfamily managers, economic performance, such as profitability and sales growth, are their major, if not only concern, as they will use employer performance to signal their ability in the job market (Block, 2011). It should be noted that this argument does not demean a family manager's pursuit of economic goals. In fact, as potential successors of the family business, family managers are incentivized to enhance firm performance so that they can inherit the business when the last generation retires. Driven by such a vision, family employees show lower rate of absenteeism and shorter absence duration than nonfamily employees, suggesting that family employees are more dedicated to their family business and are more interested in the firm's profitability (Block et al., 2014).

With respect to non-economic goals, family managers are intrinsically motivated to fulfill these goals because they are closely tied to the business. In turn, nonfamily managers do not benefit from realizing these goals since they are not members of the family. Therefore, nonfamily managers are unlikely to care about the family's non-economic goals that consist of family-specific concerns, such as family value, family social status, and socioemotional wealth (Chrisman et al., 2012; James, 1999; Memili et al., 2013). The incongruent goals that exist between nonfamily managers and family firms generate costs for the firm. As Chrisman et al. (2012) state, "incentives can serve to align the interests of owners and managers but are costly remedies and some of the benefits from adopting FCNE goals, such as improving the family's social status, are not transferrable to non-family managers" (p. 272). In this sense, choosing a family manager can be cost saving for the family firm. This is substantiated by previous empirical studies showing that family CEOs are paid less than nonfamily CEOs working in family firms (Gómez-Mejía et al., 2003; McConaughy, 2000).

6 Hiring family or nonfamily managers in family firms: a multitask model¹⁷

6.1 Introduction

Jorgen Knudstorp has been the CEO of the family firm LEGO since 2004 after taking over the position from the firm founder's grandson. Mr. Knudstorp explained that he was appointed as CEO because his values are aligned with the LEGO family even though he is not part of the family. He also stated in an interview that the LEGO family shareholders "are not always primarily concerned with the traditional notion of shareholder value; what really matters might not be a financial question, it might be other less tangible things."¹⁸ It is well-known that family firms pursue so-called economic and non-economic goals (Astrachan and Jaskiewicz, 2008; Chrisman et al., 2012; Gómez-Mejía et al., 2007). The former refer to the firm's financial performance while the latter concern other goals important to the family such as family harmony, family reputation, or the intention of intrafamily succession (Berrone et al., 2012; Chrisman et al., 2012). Managers in family firms need to fulfill both economic and non-economic goals. The process of hiring top managers in family firms is therefore complex. Prior literature has identified several aspects that are important when it comes to whether hiring family or non-family managers, including the availability of qualified family managers (Lee et al., 2003), the managers' abilities (Burkart et al., 2003), the family's risk attitude towards non-economic goals (Gómez-Mejía et al., 2007), and the importance of family goals for the firm (Memili et al., 2013). Prior research has not considered that economic and non-economic tasks can be interdependent and differ in the degree to which their achievement can be measured.

This paper makes a first step in this direction by incorporating and extending some of the ideas by Holmström and Milgrom (1991) and Baker (1992, 2002) in the context of family businesses. As one important feature of this study, it recognizes that the top manager's tasks related to economic and non-economic goals interrelate with each other. In general, this study posits that the

¹⁷ This chapter is based on a working paper which is cooperated with Jörn Block (Universität Trier), Jenny Kragl (EBS Universität für Wirtschaft und Recht) and Alberto Palermo (EBS Universität für Wirtschaft und Recht). The working paper was presented by me at the "China 2015 Family Firm Conference" in Beijing on September 7th, 2015, and at the G-Forum conference in Oldenburg on November 14th, 2014.

¹⁸ Egon Zehnder. In interview with Jorgen Knudstorp. Retrieved from <http://www.egonzehnder.com/the-focus-magazine/topics/the-focus-on-identity/interview/every-year-we-throw-away-the-trophies-and-start-all-over-again.html> on July 5th, 2017.

tasks related to fulfilling economic and non-economic goals in family firms can be complements or substitutes; that is, they can either reinforce or exclude each other. As an example for the latter situation, consider the case of Krister Ahlström, former CEO of the Ahlström Corporation in the family's fourth generation. He tried to persuade the family board into selling out an unprofitable traditional business unit but received harsh criticism from the board members.¹⁹ Shutting down an unprofitable business and laying off its employees may help the firm enhance economic performance, but doing so may harm the family's reputation in the public since the Ahlström family's name is strongly connected to its original business. By contrast, tasks are complementary if economic and non-economic goals complement each other. For instance, family firms set up philanthropic foundations in the name of the family alongside their core business in order to build up a positive public image that may attract more customers and competent employers. This study aims to understand how task interdependence influences top manager hiring decisions in family firms.

To investigate this research question, this study uses a multitask principal-agent model in the spirit of Holmström and Milgrom (1991).²⁰ In this model setting, the family firm owner (principal) chooses a manager (agent) between a family and a nonfamily member. The firm owner values both economic and non-economic goals, and the manager has to work on tasks related to both types of goals. In this model, it is assumed that a manager's achievement of economic goals can be well captured by available performance measures such as accounting profit; by contrast, the achievement of non-economic goals is captured only to a smaller extent, because these goals contain non-financial and long-term aspects such as family reputation that can hardly be measured (Chrisman et al., 2012). Moreover, this study models two important characteristics in which the two types of managers typically differ. Firstly, the nonfamily manager will typically have a higher ability than the family manager with regard to economic goals as he is drawn from a large pool of suitable candidates (Burkart et al., 2003; Pérez-González, 2006). On the contrary, this study argues that the family manager will usually have a higher ability in fulfilling the family's non-economic goals because as part of the family, he knows better how to communicate with the family and fulfill the family's goals. Secondly, Chrisman et al. (2012) argue that family managers have a personal

¹⁹ See Magretta (1998).

²⁰ Throughout the study, the male pronoun for the agent (manager) and the female pronoun for the principal (firm owner) are used.

interest in the pursuit of non-economic goals as opposed to non-family managers. This study extends this idea by assuming that the family manager has a personal interest in the welfare of the family firm.

In this framework, this study derives three main results highlighting the rationale as to why the firm owner sometimes finds it optimal to hire a family manager and sometimes prefers a non-family manager. First, in absence of ability difference between the family and the nonfamily manager, the firm owner will always hire the nonfamily manager if not the family manager exhibits intrinsic care for the firm. This is because the nonfamily manager is better at the economic task which can be more effectively incentivized. Second, this study verifies that task interdependence has a decisive effect on the firm owner's optimal hiring decision if the family and the nonfamily manager have different abilities. In particular, the more complementary the tasks, the more likely hiring a family manager will be optimal, because the family manager has a higher ability in the non-economic task and will hence not be willing to neglect this task as strongly as the nonfamily manager. This study further shows that the foregoing conclusion holds more often as the non-economic task can be better measured and incentivized. Third, this study finds that if the tasks are highly substitutable, the firm owner will deliberately neglect the family's non-economic goals and turn to hiring the nonfamily manager.

With this result, this paper contributes to prior research about the top management hiring decisions in family firms (Chrisman et al., 2012; Vandekerckhof et al., 2015; Salvato et al., 2012). This model shows that the firm owner's decision of hiring a family or a nonfamily manager is driven not only by the managers' abilities (Burkart et al., 2003; Salvato et al., 2012), but also by the measurement of non-economic tasks and task interdependence between economic and non-economic tasks. Thus, this model offers a new explanation why some family firms choose family members as top managers whereas others choose nonfamily members. Next to the literature about the top management hiring decisions in family firms, this paper contributes to the discussion about how family firm's economic and non-economic goals interrelate with each other and how this influences family firm's strategy and behavior (Chrisman et al., 2012; Memili et al., 2013; Martin and Gómez-Mejía, 2016).

The remainder of the paper is structured as follows. The next section provides a literature review of the relevant literature on family firms' goals and top management hiring decisions as well as the economic literature on incentive contracting under multitasking. In Sections 6.3 and 6.4,

this study presents the model and a benchmark case with contractible effort, respectively. In the Section 6.5, this study solves for the optimal incentive contract for each manager type and analyzes the effects of intrinsic care, task interdependence, and the alignment of the performance measure with firm value. Section 6.6 presents the main findings regarding the optimal hiring decision. Section 6.7 offers a discussion of the main results and the final section concludes, thereby highlighting the avenues for further research

6.2 Literature review

6.2.1 Choosing a family versus a nonfamily manager

Hall and Nordqvist (2008) elaborate two types of abilities that are required to run a family business, namely formal ability and cultural ability. The former is attained through formal education and occupational experience; the latter refers to the ability of understanding family goals, values, and norms. With regard to the former ability, nonfamily managers compete in the job market by using former employer's financial record as a signal of their management ability (Block, 2011). Because nonfamily managers are selected from a larger sample pool of talents (Burkart et al., 2003; Pérez-González, 2006), they are more likely to have greater management skills and experience than family managers. Regarding the cultural ability, it is obvious that family managers are superior to nonfamily managers because, as part of the family, they can better understand the family's objectives and prospects.²¹ The managers' abilities are major concerns for family firms, but the firms' hiring decision depends on other factors as well.

Appointing a family manager ensures that the family can exert its influence directly and easily on its business through strategic and operational plans (Klein et al., 2005). Agency conflict between the family and the manager is less of an issue for family managers whose goals are usually aligned with the family (Chrisman et al., 2004; Chrisman et al., 2012; Schulze et al., 2003). In contrast to nonfamily managers who may only focus on the family firm's short-time performance, family managers are more concerned with the firm's long-term performance as well as the family's reputation and its public image, which are also in the interest of family firms (Chrisman et al., 2012; Block, 2011). Family managers attain additional benefit from an increase in firm value beyond the

²¹ In the model section, it is argued that nonfamily managers are better than family managers at achieving the firm's economic goals. In contrast, family managers have higher abilities than nonfamily managers to fulfill the family's non-economic goals.

incentive pay (Memili et al., 2013), as it is argued that family managers have personal interest in the pursuit of the family's goals (Chrisman et al., 2012).²² Furthermore, choosing a family manager can save cost for the family firm, as previous empirical studies show that family CEOs are paid less than nonfamily CEOs working in family firms (Gómez-Mejía et al., 2003; McConaughy, 2000).

However, the promotion of family members in family firms may jeopardize firm performance (Dyer, 2006). On one hand, nepotism creates a negative perception and emotion among nonfamily employees against the firm, resulting in low work performance (Barnett and Kellermanns, 2006; Padgett and Morris, 2005). On the other hand, family members that are selected as managers may not have the capability and skills to successfully run the family business (Dyer, 2006). In fact, because family firms view management skills as more critical than nepotism when choosing a new manager (Salvato et al., 2012), nonfamily managers are preferred over family managers considering that the former have higher management skills. Furthermore, nonfamily managers bring into family firms outside resources such as business networks and financial capitals (Sonfield and Lussier, 2009), and hiring them can avoid within-family conflict (Lee and Rogoff, 1996). In some cases where none of the family candidates are qualified, hiring a nonfamily manager is the only option the family has.

This study presents the arguments that support the recruitment of a family versus a non-family manager in Table 6-1.

²² According to Chrisman et al. (2012), this study argues that moral-hazard problem can be mitigated with family managers by assuming that family managers intrinsically care about the family firm's overall value (see Section 6.3).

Table 6-1: Arguments that support hiring a family versus a nonfamily manager

Family manager	Maintain family influence (Klein et al., 2005) Lower agency cost (Chrisman et al., 2004; Schulze et al., 2003) Goal alignment (Chrisman et al., 2012) Lower pay (Gómez-Mejía et al., 2003; McConaughy, 2000)
Nonfamily manager	Avoid nepotism (Barnett and Kellermanns, 2006; Dyer, 2006; Padgett and Morris, 2005) Higher management ability (Burkart et al., 2003) Bring in outside resources (Sonfield and Lussier, 2009) Mediate family conflict (Lee and Rogoff, 1996)

6.2.2 Economic and non-economic goals

As it is discussed in Section 5.2, family business literature acknowledges that in addition to economic goals, family firms also pursue non-economic goals, which consist of family harmony, family social status, family identity linkage, philanthropy, environmental preservation and emotional value (Chrisman et al., 2005; Chrisman et al., 2012; Zellweger and Astrachan, 2008). Although Gómez-Mejía et al. (2007) show that family firms are willing to preserve SEW at the cost of the firms' financial performance, it is also argued that family firms' financial and non-financial goals can be beneficial to each other (Kabbach de Castro et al., 2016). In a conceptual work of Martin and Gómez-Mejía (2016), the relationship between financial wealth and SEW is not only negative, as most previous studies have assumed (e.g., Berrone et al., 2010; Gómez-Mejía et al., 2007; Stockmans et al., 2010), but can also be positive, namely the pursuit of economic goals can increase the value of SEW.

Arguably, the family manager is motivated to fulfill both economic and non-economic goals of the family firm, whereas the nonfamily manager, as an outsider, may focus only on economic performance and ignore the non-economic goals since he does not benefit from pursuing these goals (Chrisman et al., 2012; Gómez-Mejía et al., 2007; Lee and Rogoff, 1996). Although previous research has pointed out the importance of the non-economic goals for family firms, little is known about how the interrelationship between economic and non-economic goals affects managers' efforts exerted in pursuing these goals, and consequently, how the resulted effort levels affect the family firm's decision to hire a family or nonfamily manager.

6.2.3 Multitask principal-agent model

The family firm's economic and non-economic goals correspond to two types of tasks that a manager has to perform. Each of the two tasks contributes to the realization of the two goals respectively. To model this situation, this study implements a multitask principal-agent model proposed by Holmström and Milgrom (1991). In their model, a risk-neutral principal designs an incentive contract for a risk-averse agent to direct his time and effort between two tasks that can be either substitutes or complements. Also, the agent's effort in one task can be measured and incentivized by a piece-rate, whereas the effort in another task cannot be observed and therefore, is excluded from the incentive contract. Holmström and Milgrom (1991) find that task interdependence and performance measure have an impact on the incentive contract offered by the principal to the agent. More specifically, the incentive pay for the measurable task increases if the two tasks are complement, because compensating more on one task can induce the agent to exert more effort in both tasks. On the contrary, if the two tasks are substitute, the incentive pay is lowered to prevent the agent from distorting his effort towards the measurable and well-paid task while neglecting the unobservable task. In particular, in a case of perfect task substitute, an optimal contract includes only a fixed pay, which explains the prevalence of fix-pay scheme in business world.

The compensation scheme that a firm designs for its manager may not (fully) contribute to the realization of the firm's true objectives (Kerr, 1975). A typical example is that the firm hopes for long-term profit for its business, but can only compensate the manager for observable short-term financial performance, which induces the manager to act shortsightedly and opportunistically to the detrimental of the firm's long-term sustainability. Kerr (1975) suggests that the reason the agent deviates from the principal's expectation is that the principal is unable to specify her objective in the agent's incentive contract. Baker (1992) shows that an imperfect performance measure distorts an agent's effort in a way the principal does not desire. The distortion between the principal's objective and the performance measure leads to a second-best effort even for a risk-neutral agent. The principal will then lower the piece-rate to mitigate the distortion caused by the imperfect performance measure. Moreover, the more inaccurate the performance measure is, i.e., the lower the correlation between the principal's objective and the performance measure is, the lower the incentive power will be.

The multitask model has been further extended and applied in various fields. For example, Holmström and Milgrom (1994) extend the multitask principal-agent model to analyze the measuring cost and its impact on the incentive contract; Hellmann (2007) explains that some employees leave their firms to become entrepreneurs because their innovative activities are not in line with their core tasks and are not encouraged by their employers; Block (2011) analyzes the incentive contract offered for nonfamily managers in a family business by using multitask model and signaling theory; Kragl and Schöttner (2014) find that if the minimum wage imposed on the incentive contract is sufficiently large, the principal will hire one agent and spare him the necessity of doing the competing task that is less productive.

Though multitask principal-agent model is widely used in understanding agent's behavior and in designing optimal incentive contract, it is the first time, to our knowledge, that this model is applied to investigating a family firm's hiring decision between a family versus a nonfamily manager. This paper aims at filling the research gap by implementing the multitask model in the family business context.

6.3 The model

This study models a principal-agent relationship in which the family firm owner (principal) selects one out of two candidates (agent) to manage the firm. The former has two options; hiring a family manager (F), that is, a person with family ties to the firm, or a nonfamily manager (N), that is, somebody who is not part of the business-owning family. All parties are risk neutral. Managing the firm requires fulfilling two tasks; enhancing the firm's economic performance (henceforth denoted by task 1) and realizing the family's non-economic goals such as preserving and fostering the family's reputation (henceforth denoted by task 2). The tasks cannot be split between managers; that is, just one manager will be hired.²³ With $i \in \{F, N\}$ denoting the manager's type, by effort $e_{i,1}$ this study refers to all the activities manager i undertakes to raise the firm's economic performance, e.g., the stock price. Effort $e_{i,2}$ summarizes the manager's efforts related to achieving the family's non-economic goals. Effort levels are not observable by the firm owner, implying a moral-hazard problem.

²³ Separating the tasks between managers is not plausible in many management cases. Notably, also if the tasks could be assigned to different managers, hiring just one manager will oftentimes be optimal if tasks are interdependent.

The firm owner's non-verifiable valuation of the manager i 's effort in the two tasks is given by:²⁴

$$V_i = e_{i,1} + e_{i,2}. \quad (6-1)$$

That is, for simplicity, this study assumes that both tasks are equally important to the firm owner.²⁵ The contractible performance measure reflects that achievement in the non-economic task can typically not be measured as well as achievement in the economic task:

$$p_i = e_{i,1} + \alpha e_{i,2}, \quad (6-2)$$

where $\alpha \in (0, 1)$ denotes the impact of the non-economic task on the performance measure.²⁶ Accordingly, the performance measure is distorted towards task 1 as the impact of task 2 on firm value cannot be measured perfectly. In the sense of Baker (2002), the performance measure is the more (mis)aligned with firm value the higher (lower) is α .²⁷

The firm owner pays manager i a fixed wage w_i and an incentive rate $\gamma_i \in [0, 1]$ per unit of p_i . Moreover, this study assumes that a manager's wage cannot be negative in any state, i.e., there is limited liability on the side of the manager.

The firm owner's utility when hiring manager i is thus given by the profit:

$$\pi_i = (1 - \gamma_i)(e_{i,1} + \alpha e_{i,2}) + (1 - \alpha) e_{i,2} - w_i. \quad (6-3)$$

Similar to Holmström and Milgrom (1991), manager i 's private cost of exerting effort is described by:

$$C(e_{i,1}, e_{i,2}, D_i, d_i; s) = \frac{D_i}{2} e_{i,1}^2 + \frac{d_i}{2} e_{i,2}^2 + s e_{i,1} e_{i,2}, \quad (6-4)$$

²⁴ This is in line with the argument from Chrisman et al. (2014), who states: "the utility of family owners is a function of the extent to which economic and noneconomic goals are valued and achieved" (p. 12).

²⁵ Obviously, the assumption can easily be relaxed.

²⁶ Note that, for simplicity, this study disregards uncertainty in both firm value and the performance measure. The moral-hazard problem however persists because, due to the multitasking problem, the principal cannot infer $e_{i,1}$, $e_{i,2}$ from the observed realization of p .

²⁷ In Baker's model, in case of two tasks, the non-contractible firm value is given by $V = f_1 a_1 + f_2 a_2 + \varepsilon$, where a_1, a_2 are the effort levels in the two tasks, $f = (f_1, f_2)$ is the vector of the marginal products, and ε is a random term. The contractible performance measure is given by $P = g_1 a_1 + g_2 a_2 + \phi$, where $g = (g_1, g_2)$ is the vector of the tasks' marginal products on the performance measure, and ϕ is the random term. The misalignment between V and P is then reflected by the angle between f and g . Applying this framework to this model, there is: $f_1 = f_2 = g_1 = 1$ and $g_2 = \alpha$. Accordingly, the lower α , the larger will be the angle between f and g and the higher will thus be the misalignment between the firm value and the performance measure.

where D_i , d_i are inverse measures of the manager's ability in the economic task 1 and the non-economic task 2, respectively and the parameter $s \in (-\sqrt{D_i d_i}, \sqrt{D_i d_i})$ measures the task interdependence.²⁸ If $s > 0$, the tasks are *substitutes*, i.e., the tasks compete for the manager's attention so that he finds it harder to engage in one task when he is already working on the other. Formally, effort in one task increases the manager's marginal effort costs for the other task. By contrast, if $s < 0$, the tasks are *complements*. In that case, performing one task facilitates the manager's efforts in the other task, i.e., reduces his marginal effort costs for the other task. Obviously, tasks are independent if $s = 0$.²⁹

This study makes the following assumptions regarding the managers' relative abilities across tasks and manager type:³⁰

Assumption 1: (i) $D_N < d_N$, (ii) $d_F < D_F$, (iii) $d_F < d_N$, and (iv) $D_N < D_F$.

Assumption 1 ensures that, within manager types, (i) the nonfamily manager is relatively better at task 1 whereas (ii) the family manager is relatively better at task 2. Across manager types, (iii) the family manager has a higher ability in task 2 than the nonfamily manager whereas (iv) the nonfamily manager has a higher ability in task 1 than the family manager.

To simplify the further exposition of the model, this study introduces the following definition:

Definition 1: *Family and nonfamily managers are symmetric in terms of ability if $d_N = D_F$ and $d_F = D_N$.*

That is, managers are said to be symmetric if the family manager is as good at task 2 as is the nonfamily manager at task 1 and vice versa.

Manager i 's utility is given by:

²⁸ The restriction on s ensures that the first-order conditions to the optimization problems are sufficient for interior solutions.

²⁹ In modeling the task interdependence, this study uses a simplified version of the effort-cost function presented by Holmström and Milgrom (1991). Alternatively, the interdependence can be modeled in the production function. However, the results are not affected.

³⁰ See Sections 6.2.1 and 6.2.2 and the references therein for the underlying arguments and evidence.

$$U_i = w_i + \gamma_i (e_{i,1} + \alpha e_{i,2}) - \frac{D_i}{2} e_{i,1}^2 - \frac{d_i}{2} e_{i,2}^2 - s e_{i,1} e_{i,2} + \theta_i \pi_i, \quad (6-5)$$

where $\theta_N = 0$ and $\theta_F \in [0, \frac{1}{2}]$ measures the family manager's personal (intrinsic) interest in the total value of the family firm. That is, the nonfamily manager is purely self-regarding and does not exhibit any personal valuation of the family firm while the family manager may exhibit other-regarding preferences towards his family's firm and attach personal value to it.³¹ As verified below, it is straightforward that θ_i can be regarded as an inverse measure of the magnitude of the moral-hazard conflict.³²

The timing is as follows. First, the firm owner decides whether to hire the family or the nonfamily manager. Then she offers the manager an employment (incentive) contract. Third, the manager decides whether to accept the contract or reject it in favor of his outside option, which, for simplicity, is set to zero. If the manager accepts the contract, he chooses his effort levels in task 1 and 2. Finally, the firm value and the performance measure are realized and the manager is paid according to the contract. All proofs are relegated to the Appendix.

6.4 Benchmark case

As a benchmark, this study first determines the effort levels that maximize the joint net surplus from the employment relationship. That is, the manager's optimal effort levels and the resulting profit in the absence of any agency problem are derived. In this section, the analysis focuses on purely self-regarding preferences ($\theta_i = 0$).³³ The solution to the problem is relegated to the Appendix. Below it summarizes the main results regarding the impact of task interdependence s and the manager's abilities in task 1 and 2, D_i, d_i , on the efficient effort levels, the expected firm

³¹ This study restricts $\theta_F \in [0, \frac{1}{2}]$ because, for $\theta_F = \frac{1}{2}$, the family manager's optimal incentive (and total) pay becomes just zero. In the given model, $\theta_F > \frac{1}{2}$ implies such a strong personal valuation of firm profit on the side of the family manager that he would be willing to work for free (if $\theta_F \in [\frac{1}{2}, 1]$) or even put funds in the firm in order to work as a manager (if $\theta_F > 1$). While the latter two cases may be of interest in general, they are beyond the scope of the given paper.

³² See Sections 5.3 and 6.2.1 and the literature therein. The assumption is in line with the well-known reasoning regarding the effects of a separation of ownership and control (Jensen and Meckling, 1976) on the magnitude of the moral-hazard conflict.

³³ Note that the solution is equivalently computed by considering an agency scenario with contractible effort and no financial constraints. The (fixed) wage contract then stipulates the benchmark effort levels. For the considered case ($\theta_i = 0$), the solution is equivalent to the first-best scenario.

profit, and the optimal hiring decision. Throughout the paper, the analyses focus on cases with both effort levels strictly positive, i.e., this study assumes that s is not too large.

The following lemma establishes the findings regarding the impact of managerial ability on the managers' optimal effort levels.

Lemma 1: *In the benchmark case, for manager $i, i = F, N$, this study finds:*

- i) The optimal effort level $e_{i,1}^*$ in task 1 is (a) decreasing in D_i for all s , (b) decreasing in d_i for $s < 0$, and (c) increasing in d_i for $s > 0$.*
- ii) The optimal effort level $e_{i,2}^*$ in task 2 is (a) decreasing in d_i for all s , (b) decreasing in D_i for $s < 0$, and (c) increasing in D_i for $s > 0$.*

Intuitively, regardless of the manager type, as D_i (d_i) increases, the manager's marginal effort cost for task 1 (2) increases. In other words, working more in the respective task gets relatively more costly as the manager's ability is lower. As a result, the manager exerts less effort in the respective task. Moreover, if tasks are complements ($s < 0$), this negatively affects the effort in the respectively other task as well. The reason is that, ceteris paribus, lowering the effort exerted in one task raises the marginal effort cost for the other task. Since the marginal return from effort in a given task is not affected, a lower ability on one task reduces effort in the other task as well. By contrast, if tasks are substitutes ($s > 0$), lowering the effort in one task reduces the marginal effort cost for the other task. Accordingly, a lower ability in one task will lead to a higher level effort in the other task as the manager reallocates effort in line with his abilities.

By equations (A-4) and (A-5) in the Appendix, the manager's optimal effort levels depend on the task, the degree of task interdependence s , and the manager type as stated in the following lemma.

Lemma 2: *In the benchmark case, this study finds:*

- i) *For the family manager ($i = F$):*
 - a) *the optimal effort level $e_{F,1}^*$ in task 1 is decreasing in s for all s , and*
 - b) *the optimal effort level $e_{F,2}^*$ in task 2 is decreasing in s if $s < \tilde{s}$ with $\tilde{s} > 0$ and increasing in s otherwise.*
- ii) *For the nonfamily manager ($i = N$):*
 - a) *the optimal effort level $e_{N,1}^*$ in task 1 is decreasing in s if $s < \hat{s}$ with $\hat{s} > 0$ and increasing in s otherwise, and*
 - b) *the optimal effort level $e_{N,2}^*$ in task 2 is decreasing in s for all s .*

As s increases, ceteris paribus, the two tasks turn to be relatively more exclusive (or less complementary) to each other. Each manager then reduces his effort exerted in the task he finds harder. That is, the (non)family manager's effort level in task 1 (2) is strictly decreasing in s . If $s < 0$ each manager will moreover reduce his effort in the task for which he has a relatively higher ability as tasks are complements and reducing effort in one task will have a negative effect also on the other. The manager will continue to lower his effort in that task also if $s > 0$ and tasks are substitutes until s reaches a certain value (\tilde{s}). As s increases above this threshold, the manager will start to increase his effort in the relatively more productive task again. That is, for $s > 0$ the (non)family manager's effort in task 2 (1) is a U-shaped curve in s . Intuitively, as tasks are sufficiently strong substitutes, the manager will be better off by devoting his capacity mainly to the task which he is better at.³⁴

³⁴ Decisive for whether the manager lowers or raises effort in the more productive task is the overall impact of an increase in s on the respective marginal effort costs. Note that an increase in s can in- or decrease these marginal costs. For instance, the family manager's marginal cost of doing task 2 is given by $d_F e_{F,2} + s e_{F,1}$. The impact of s on the marginal effort costs is hence positive if s is large enough compared to $e_{F,1}$. From Lemma 2 i)a), it is known that equilibrium effort $e_{F,1}^*$ is however decreasing in s . For \tilde{s} , that effort becomes eventually so small that the effect of an increase in s is overcompensated, thereby causing a decrease in the marginal cost of task 2 and hence an increase in the optimal effort $e_{F,2}^*$ in that task. For the nonfamily manager, analogous reasoning applies with respect to task 1.

Investigating how the foregoing results affect the firm owner's utility, this study finds:

Lemma 3: *In the benchmark case, the firm owner's utility is decreasing in D_i , d_i , and s .*

With respect to the manager's ability, note that Lemma 1 shows a decrease of effort in both tasks as D_i or d_i increases if tasks are complements ($s < 0$). The firm owner's utility will accordingly decrease. If tasks are substitutes ($s > 0$), the optimal levels of effort in task 1 and 2 alter in different directions as D_i and d_i increase. However, due to the convexity of the effort-cost function in each task, more different levels of effort in the two tasks are more costly and hence lead to lower profit. Intuitively, as managers become less skilled but the marginal return is constant, total effort (and hence wage) cost go up and overall less efficient effort levels will be implemented.

In terms of task interdependence, varying s from the minimum to the maximum value implies that the task interdependence shifts from high complementarity to high substitutability. That is, as s increases, the manager's benefit from concurrently working on both tasks first diminishes and then turns into a cost. Consequently, as s increases, total exerted efforts go down while effort costs go up, resulting in a decrease of the firm owner's overall utility.

From the foregoing two lemmas and their proofs this study can directly draw a conclusion regarding the relative attention that managers devote to the different tasks, depending on their type and the associated relative abilities.

Corollary 1: *In the benchmark case, for any given s , the nonfamily manager focuses relatively more on the economic task while the family manager focuses relatively more on the non-economic task. A manager's effort difference across tasks is smallest when tasks are independent; otherwise the difference in effort is increasing as the absolute value of s increases.*

Intuitively, because a manager's marginal cost of doing the more productive task is lower than for the other task, each manager will pay relatively more attention to the task he is more skilled in regardless of task interdependence. However, the degree of the managers' relative attention to the two tasks varies in s . First, as s increases in the range of $s < 0$, for both managers, the difference between $e_{i,1}^*$ and $e_{i,2}^*$ is decreasing in s . To understand the intuition, recall from Lemma 2 that each

manager's effort levels in both tasks, $e_{i,1}^*$ and $e_{i,2}^*$, are decreasing in s for $s < 0$. As a manager reduces efforts, his ability advantage of doing the more productive task diminishes so that at the point $s = 0$, the manager's effort difference between the two tasks is the lowest. Second, as s increases in the range of $s > 0$, from Lemma 2 it is known that each manager reduces his effort in the task in which he is less skilled, and for s sufficiently large, he will moreover increase his effort in the more productive task. This implies that, as the tasks become more exclusive to each other, a manager is better off by diverting his attention to the more productive task. As a result, the difference between $e_{i,1}^*$ and $e_{i,2}^*$ increases in s for $s > 0$.

As explained in the Appendix, in the benchmark case, the firm owner extracts all the surplus whereas the manager obtains only his outside option. For any given s , the manager will work at the efficient level in both tasks, according to his respective abilities. By the foregoing results and the optimal profit function in equation (A-6) in the Appendix the following conclusion regarding the family firm owner's optimal hiring decision is straightforward.

Proposition 1: *In the benchmark case, as long as managers are symmetric in terms of ability, the firm owner is indifferent as to whom to hire. Once managers are not symmetric, the optimal hiring decision depends on the manager's abilities. In particular, for any given s , manager i is preferred to manager j if $\min\{D_i, d_i\} < \min\{D_j, d_j\}$ and either (i) $D_i + d_i < D_j + d_j$ or (ii) $D_i + d_i \geq D_j + d_j$ and $\min\{D_i, d_i\}$ sufficiently small.*

As to the first part of the proposition, it is straightforward that the firm owner's utility coincides for symmetric managers as both tasks are equally important. As to the case of asymmetric managers, the above result implies that, if managers differ regarding their ability only with respect to one task, i.e., either $d_N = D_F$ or $d_F = D_N$, then the manager for whom $(D_i + d_i)$ is lower will be hired, i.e., the overall more efficient or skilled manager. Once managers are asymmetric with different levels of abilities in both tasks, the firm owner will hire a manager only if he is more skilled in his more productive task than is the other candidate in his respective more productive task ($\min\{D_i, d_i\} < \min\{D_j, d_j\}$). Under this condition, a manager will be preferred by the firm owner if he is either (i) overall more efficient or (ii) he is particularly skilled in his more productive

task. Intuitively, even if manager i is not globally more skilled ($D_i + d_i \geq D_j + d_j$), this may be outweighed by an extraordinary performance in one of the tasks.

6.5 The moral-hazard problem

This section analyzes the case where a manager's effort levels are his private information, firm value V_i is non-verifiable, and the firm owner uses an incentive contract based on the distorted performance measure p_i to mitigate the resulting moral-hazard problem. Since, due to limited liability of the managers, wages cannot be negative, the well-known trade-off between rent and efficiency arises, and providing the manager with effort incentives leads to the payment of an information rent, thereby raising the firm owner's wage costs. This section first solves for the second-best solution for both manager types i , that is, derives the optimal effort levels in the two tasks, the respectively optimal incentive contract, and the firm owner's utility. This section also discusses the impact of the manager's personal valuation of firm profit on the optimal contract and the firm owner's utility. Then this section compares the results for the family and the nonfamily manager and analyze the effects of managerial abilities, the distortion created by the performance measure, and the task interdependence on the solution.

6.5.1 The optimal incentive contract

The firm owner's profit maximization problem when hiring manager i is given by:

$$\max_{w_i, \gamma_i, e_{i,1}, e_{i,2}} \pi_i = (1 - \gamma_i)(e_{i,1} + \alpha e_{i,2}) + (1 - \alpha) e_{i,2} - w_i \quad (I)$$

s.t.

$$U_i = w_i + \gamma_i (e_{i,1} + \alpha e_{i,2}) - C(e_{i,1}, e_{i,2}, D_i, d_i; s) + \theta_i \pi_i \geq 0 \quad (PC)$$

$$e_{i,1}, e_{i,2} \in \arg \max_{\hat{e}_{i,1}, \hat{e}_{i,2}} U_i = w_i + \gamma_i (e_{i,1} + \alpha e_{i,2}) - C(e_{i,1}, e_{i,2}, D_i, d_i; s) + \theta_i \pi_i \quad (IC)$$

$$w_i + \gamma_i (e_{i,1} + \alpha e_{i,2}) \geq 0 \quad (NNC)$$

The first constraint (PC) is the participation constraint which guarantees that the manager is not worse off if accepting the contract rather than rejecting it in favor of his outside option. The second constraint (IC) is the incentive-compatibility constraint according to which the manager chooses his effort levels so as to maximize his own utility for any given incentive contract. The last constraint (NNC) ensures that manager i 's wage payment $w_i + \gamma_i p_i$ is non-negative for any pair of efforts $(e_{i,1}, e_{i,2})$. The formal solution to the problem is relegated to the Appendix.

Recall that a manager's personal (intrinsic) interest in the total value of the family firm is measured by θ_i with $\theta_N = 0$ and $\theta_F \in [0, \frac{1}{2}]$. The optimal incentive contract is characterized by the following lemma.

Lemma 4: *The optimal incentive contract $\langle \gamma_i^{**}, w_i^{**} \rangle$ for manager $i = \{F, N\}$ is given by:*

$$w_i^{**} = 0 \quad (6-6)$$

$$\gamma_i^{**} = \frac{1 - 2\theta_i}{1 - \theta_i} \times \frac{(d_i - \alpha s) + (D_i \alpha - s)}{2[(d_i - \alpha s) + \alpha(D_i \alpha - s)]} \quad (6-7)$$

As it will be shown below, the manager always obtains a rent in the given setting. The firm owner will thus set the fixed wage as low as possible to minimize wage costs. Given the lower bound on the wage, the optimal fixed wage will hence be set at zero. Three further observations regarding the incentive pay are notable. First, it is easily verified that $\gamma_F^{**} > \gamma_N^{**}$ if $\theta_F = 0$. That is, the optimal incentive pay is in that case relatively higher-powered for the family manager. Intuitively, the piece-rate is based on the distorted performance measure p_i and thus less strongly rewards effort in task 2. As a result, both managers' effort levels will be distorted towards task 1. However, because the family manager is relatively better at task 2, the effort distortion will be less strong for this type of manager so that the piece-rate is more effective regarding the firm owner's objective. It will hence be set higher at the optimum. By contrast, the incentive pay is relatively more harmful with respect to effort misallocation for the nonfamily manager and will be set lower to avoid that the manager strongly neglects task 2. In Lemma 9 below this study investigates the impact of α on the optimal levels of effort in more detail.

Second, γ_i^{**} is decreasing in θ_i for given d_i, D_i . This is due to the fact that the family manager attaches a personal valuation to firm value and must hence, ceteris paribus, not be incentivized as strongly as the nonfamily manager to exert some given levels of effort. The foregoing implies that, although it is found that $\gamma_F^{**} > \gamma_N^{**}$ for $\theta_F = 0$, eventually the result on the relative size of incentive pay will turn into $\gamma_F^{**} < \gamma_N^{**}$ for θ_F sufficiently large. In fact, previous literature on incentive payments in family firms shows that family CEOs receive lower total compensation (monetary payment and long-term payment) than nonfamily CEOs (McConaughy, 2000; Gómez-Mejía et al., 2003). Finally, note that $\gamma_i^{**} = 0$ if $\theta_F = \frac{1}{2}$. Intuitively, in that case, the family manager is suffi-

ciently “intrinsically” motivated to work efficiently because of his strong attachment with the family firm and the associated personal utility from raising firm value. Clearly, this is an extreme case of a family manager who highly identifies himself with the family business, shares the same values and goals with the family firm, and highly commits himself to the family business.

The following result establishes the rent payment for the managers arising in this model due to limited liability.

Lemma 5: *Given the optimal incentive contract $\langle \gamma_i^{**}, w_i^{**} \rangle$ and for the optimal effort levels $e_{i,1}^{**}$ and $e_{i,2}^{**}$, manager $i = \{F, N\}$ always gets a positive rent:*

$$U_i^{**} = \frac{[(d_i - s) + \alpha(D_i - s)]^2}{8(D_i d_i - s^2)[(d_i - s\alpha) + \alpha(D_i \alpha - s)]} + \frac{\theta_i^2 (1 - \alpha)^2}{2[(d_i - s\alpha) + \alpha(D_i \alpha - s)]} \quad (6-8)$$

Because the manager is protected by limited liability, the manager attains a rent $U_i^{**} > 0$. Observe that the second summand in the right-hand side of U_i^{**} is zero for the nonfamily manager and hence constitutes the additional rent which the family manager obtains due to his intrinsic valuation of the firm value. Note that, although the latter may receive a lower piece-rate than the nonfamily manager, his total rent may be larger due to the additional utility generated by the personal attachment to the family firm.³⁵ Finally, recall that if $\theta_i = \theta_F = \frac{1}{2}$, the family manager so strongly cares for the firm that he receives no piece-rate at all. Notably, he then still obtains a positive rent but the rent becomes independent of α :

$$U_F^{**} = \frac{\theta_F^2 (d_F - s) + (D_F - s)}{2(D_F d_F - s^2)} \text{ if } \theta_F = \frac{1}{2} \quad (6-9)$$

³⁵ More precisely, if the managers are symmetric and $\theta_F = 0$, the nonfamily manager will obtain higher rent, i.e., $U_N^{**} > U_F^{**}$. If however, $\theta_F \in [0, \frac{1}{2})$, then $U_N^{**} < U_F^{**}$ if θ_F is sufficiently large.

Finally, the impact of the family manager's personal valuation of the family firm, θ_F , on the firm owner's utility under the optimal contract is analyzed.

Lemma 6: *When hiring a family manager, the firm owner's optimal utility is strictly increasing in θ_F .*

This result verifies that θ_i is in fact an inverse measure of the magnitude of the moral-hazard conflict. The more the manager personally cares for the family firm, the more he will work even for low (or no) incentive pay and the higher will be the firm profit. It directly follows that, ceteris paribus, this provides a relative advantage to family managers compared to nonfamily managers in terms of the firm owner's utility.

6.5.2 Relative abilities, task interdependence, and effort distortion

By the results presented in the foregoing subsection, the direct effect of θ_i on incentive pay, the manager's and the firm owner's utility is straightforward. For the sake of exposition of the analysis, this subsection will hence focus on the case $\theta_F (= \theta_N) = 0$. That is, the family and non-family manager are assumed indifferent in their emotional attachment to the family firm; they are distinguished only by their abilities of performing both tasks. This study now analyzes the impact of the two manager types' relative abilities, the extent of the measurement problem, and the task interdependence on the optimal effort levels and the relative attention they pay to different tasks. This will allow us to compare the performance of the two types of managers and derive the firm owner's optimal hiring decision in the ensuing section.

In line with the benchmark case, this study first analyzes how effort levels are affected by the managers' relative abilities.

Lemma 7: *In the moral-hazard case, for manager $i, i = F, N$, this study finds:*

- i) *The optimal effort level $e_{i,1}^{**}$ in task 1 is:*
 - a) *decreasing in D_i for all α and s ,*
 - b) *decreasing in d_i for all α if $s < 0$, and increasing in d_i for a relatively large $s > \bar{s} > 0$.*
 - c) *increasing and/or decreasing in d_i for $s \in (0, \bar{s})$.*
- ii) *The optimal effort level $e_{i,2}^{**}$ in task 2 is:*
 - a) *decreasing in d_i for all α and s ,*
 - b) *decreasing in D_i if $s < \bar{s} < 0$, otherwise increasing.*

Comparing the above results with the related results for the benchmark case presented in Lemma 1, one can observe some similarities regarding the impact of abilities on the effort levels. For instance, the manager's effort level in task 2 is always decreasing in d_i for all s in both the benchmark and the moral-hazard scenario (compare the results in Lemma 1 ii)a) and in Lemma 7 ii)a)). However, in the moral-hazard case, the manager's optimal effort allocation is not only affected by his abilities and task interdependence, but also by the alignment of the performance measure with firm value, i.e., α . In the benchmark case this study finds that as long as the two tasks are substitutes ($s > 0$), the effort level in task 1 is increasing in d_i ; however in the moral-hazard case, for a relatively small s ($0 < s < \bar{s}$), the impact of d_i on effort level in task 1 can be increasing and/or decreasing depending on the magnitude of s . As the two tasks are sufficiently substitutable, ($s > \bar{s} > 0$), effort level in task 1 will be increasing in d_i for both moral-hazard and benchmark case (compare the results in Lemma 1 i)c) and in Lemma 7 i)b)).

Likewise, the impact of D_i on effort level in task 1 in the moral-hazard case is the same as in the benchmark case (compare the results in Lemma 1 i)a) and in Lemma 7 i)a)). As regard to task 2, manager's behavior in moral-hazard case deviates from the benchmark case for $\bar{s} < s < 0$. This distortion results from the presence of imperfect measurement of task 2.

The next result presents the impact of the task interdependence s on the optimal effort levels in both tasks.

Lemma 8: *In the moral-hazard case, for manager $i, i = F, N$, this study finds:*

- i) *The optimal effort level $e_{i,1}^{**}$ in task 1 is:*
 - a) *decreasing in s for $s < 0$ and for all α . Otherwise,*
 - b1) *if $d_F < D_F\alpha^2$, it is decreasing in s for $s > 0$ and for all α ;*
 - b2) *if $d_i > D_i\alpha^2$, it is decreasing in s for $s > 0$ if $\alpha \leq \frac{1}{2}$ and strictly convex in s if $\alpha > \frac{1}{2}$. In particular, for $\alpha > \frac{1}{2}$ and for d_i relatively large it is a U-shaped function of s ; otherwise strictly decreasing and strictly convex in s .*
- ii) *The optimal effort level $e_{i,2}^{**}$ in task 2 is:*
 - a) *decreasing in s for $s < 0$ and for all α . Otherwise,*
 - b1) *if $d_i > D_i\alpha^2$, it is decreasing in s for $s > 0$ and for all α ;*
 - b2) *if $d_F < D_F\alpha^2$, it is always strictly convex in s . In particular, for D_F relatively large it is a U-shaped function of s ; otherwise strictly decreasing and strictly convex in s .*

As in the benchmark case (Lemma 2), if the two tasks are complements ($s < 0$), the second-best effort levels in both tasks are decreasing in s for both types of managers. Different from the benchmark case, however, the performance measure imposes a strong impact on the manager's effort allocation if $s > 0$. For instance, both effort levels in moral-hazard case are strictly decreasing in $s > 0$ unless d_i or D_i is large enough. The decreasing trend for both effort levels can be explained by the fact that decreasing one effort result in reducing the detrimental factor coming from the substitutability ($se_{i,1}e_{i,2}$). While for s increasing, this effect is overcompensated, resulting in increasing marginal effort cost for both tasks. The only exception happens when either d_i or D_i is large enough. More specifically, if the manager's ability of doing one task is rather low, as s reaches a certain level, he will turn to working more in the other task.

Different from the benchmark case, a manager's optimal effort allocation is not only affected by his relative abilities d_i, D_i and the task interdependence s , but also by the quality of the performance measure, i.e., how well it captures achievement in the non-economic task, as reflected

by α . First, the next lemma analyzes how the effort levels induced in the optimal contract, $e_{i,1}^{**}$, $e_{i,2}^{**}$, are affected by the alignment of the performance measure with firm value. i.e., by variations in α .

Lemma 9: *In the moral-hazard case, for manager i , $i = F, N$, this study finds:*

- i) *For effort level $e_{i,1}^{**}$ in task 1:*
 - a) *if $d_i - \alpha^2 D_i > 0$, the optimal effort level $e_{i,1}^{**}$ in task 1 is (a) an inverted U-shaped function of α if $s < 0$ or if $0 < s < \frac{D_i}{2}$, and is (b) strictly decreasing in α if $s > \frac{D_i}{2}$.*
 - b) *if $d_F - \alpha^2 D_F < 0$, the optimal effort level $e_{F,1}^{**}$ in task 1 is decreasing in α for any given s .*
- ii) *The optimal effort level $e_{i,2}^{**}$ in task 2 is increasing in α for any given s .*

The impact of the performance measure on the manager's effort in task 2 is straightforward to understand. The more influence the outcome of task 2 has on the performance measure, the more effort the manager will put into this task. However, the effect of α on task 1 depends on task interdependence s as well as the level of α itself. The nonfamily manager's effort in task 1 is decreasing in α if tasks are sufficiently strong substitutes because he focuses more on task 2. For the same reason, the forgoing also holds true for the family manager if α is sufficiently large. By contrast, if tasks are either complements ($s < 0$) or weak substitutes, the nonfamily manager's effort in task 1 will first increase and then decrease in α . The same holds for the family manager if α is sufficiently small and thus the performance measure is rather distortive. Intuitively, in these cases, increasing effort in task 2 reduces the marginal cost of doing task 1, and as a result, the manager will exert more effort in task 1 initially. However, as α increases, the firm owner will lower the piece-rate to avoid effort distortion. Hence, the manager's marginal benefit from doing task 1 will be decreasing in α . Altogether, for s sufficiently low ($s < \frac{D_i}{2}$), the optimal effort level in task 1 is an inverted U-shaped curve on s .

Finally, the above results imply that the two managers will behave differently regarding the relative attention they devote to the different tasks.

Corollary 2: *In the moral-hazard case, for manager $i, i = F, N$, this study finds:*

- i) *The nonfamily manager puts more effort in task 1 than in task 2 for any given s and α . As α decreases, this effect is amplified.*
- ii) *The family manager puts:*
 - a) *more effort in task 2 if s is sufficiently small or if s is sufficiently large and α is relatively large. As α increases, this effect is amplified.*
 - b) *more effort in task 1 if s is sufficiently large and α is relatively small. As α decreases, this effect is amplified.*

The nonfamily manager has higher ability to do the economic task, which can be better rewarded than the non-economic task. Thus, for any given α and s , he will devote more attention to the economic task. By contrast, the family manager's effort distortion depends on d_i, D_i, s . First, if two tasks are highly complementary (s is sufficiently small), that is, doing two tasks are significantly beneficial to each other, the family manager will exert more effort in task 2 because he is better at doing this task. However, if s is sufficiently large, the degree to what extent the non-economic task can be measured will play an important role in the family manager's decision upon effort allocation between the two tasks. For a sufficiently large α , he will still put relatively more effort in task 2 as his ability advantage in that task leads to greater benefits for himself. However if α becomes sufficiently low, he will pay more attention to task 1 as this is more rewarding in terms of expected incentive pay.

Corollary 2 i) and ii)b) point out cases in which effort levels are distorted towards task 1 due to imperfect performance measure. Intuitively, the worse the non-economic task can be rewarded (lower α), the more the manager focuses on task 1, namely the effort distortion will be amplified as α decreases. In contrast, case ii)a) shows that if the two tasks are highly complementary or if the performance measure is relatively good, increasing α will motivate the family manager to work more on the non-economic task, thereby increasing the gap between the manager's effort levels devoted in task 2 and task 1.

6.6 The optimal hiring decision

To determine which manager the firm owner should optimally hire, consider the firm owner's value function when hiring manager i , i.e., the owner's utility under the optimal contract,

$$\widehat{\pi}_i \equiv \pi_i |_{e_{i,1}^{**}, e_{i,2}^{**}}:$$

$$\pi_i^{**} = \frac{[(d_i - s) + \alpha(D_i - s)]^2}{4(D_i d_i - s^2)[(d_i - s\alpha) + \alpha(D_i \alpha - s)]} \quad (6-10)$$

Before making comparisons for $i = F, N$, the next proposition analyzes how the firm owner's utility is shaped by the managers' abilities, task interdependence, and performance measure in general for manager i .

Lemma 10: *In the moral-hazard case, the firm owner's utility is decreasing in s , but increasing in α .*

As s increases, Lemma 8 suggests that the manager's effort levels in task 1 and task 2 are both decreasing in s for a negative s . Similarly, both effort levels are decreasing in $s > 0$ as long as d_i or D_i is not too large. However, even if d_i or D_i is large enough, the slight increase of effort level in one task will not exceed the decrease of effort input in the other task caused by a lower ability. Overall, this study observes a decrease of the firm owner's utility as s increases.

Regarding the impact of α , intuitively as the performance measure gets more aligned with firm value (α increases), the distortion of efforts caused by the incentive pay will be less severe. Altogether, the firm owner can more efficiently incentivize efforts and better direct them towards both tasks. Accordingly, firm profit will increase as the moral hazard problem can be more effectively mitigated.

According to the foregoing results, the optimal hiring decision, i.e., whether $\pi_N^{**} \geq \pi_F^{**}$, is determined by the manager's abilities D_i, d_i , the alignment of the performance measure with firm value as reflected by α , and by the task interdependence s .

Even in this study's simple setting, the optimal hiring decision is hence highly complex and depends on the relative values of all aforementioned variables. For the sake of exposition, this section presents graphical illustrations of the two manager types' relative performance using numerical results obtained from the model. Thereby, it highlights the importance of relative abilities,

task interdependence, the quality of the performance measure, and the personal valuation by the family manager. In all graphs below, the firm owner's value functions for both manager types are plotted, depending on the task interdependence s and for different values of α and θ_F . This study focuses on the range of s in which both effort levels are still strictly positive. This section divides the presentation in two subsections showing the case of symmetric and asymmetric abilities, respectively. For each of these cases, purposive values for the managers' abilities in line with Assumption 1 are chosen.

6.6.1 Symmetric abilities

This subsection considers the case where the nonfamily and the family manager have symmetric abilities. As what it has been defined in Definition 1, symmetric abilities mean that the nonfamily manager's ability in the economic task equals the family manager's ability regarding the non-economic goals ($D_N = d_F$) and the nonfamily manager's ability in the non-economic task equals the family manager's ability in the economic task ($d_N = D_F$).

First, the situation in which the family manager does not share personal evaluation towards the family firm, i.e., $\theta_F = 0$, is analyzed. The following proposition is formulated regarding the firm owner's hiring decision in this case.

Proposition 2: *If the family manager and the nonfamily manager only differ in ability, and their abilities are symmetric, the firm owner will always hire the nonfamily manager.*

To better illustrate the firm owner's hiring decision, this study plots graphs showing the performance of the two manager types by replacing model results with numerical values. In Figure 6-1-1 and Figure 6-1-2, this study assumes that $D_N = d_F = 0.4$, $D_F = d_N = 0.7$, $\theta_F = 0$, and varies α to see its impact on the firm owner's utility curves. In all figures throughout the paper, the solid curve indicates the firm owner's optimal utility when hiring the nonfamily manager while the dashed/dash-dotted curves refer to the owner's optimal utility when hiring the family manager.

Regarding the relative performance of the two managers, one can observe in Figure 6-1-1 that in absence of the family manager's personal evaluation of the family firm ($\theta_F = 0$) as well as symmetric abilities of the family and nonfamily manager, for a relatively low performance measure hiring the nonfamily manager will always be optimal. The intuition is that each manager distorts

his effort towards the task that he has a higher ability to do. In this regard, the nonfamily manager, whose ability of performing economic task is higher, is more advantageous than the family manager as the economic task can be better observed.

Moreover, as α increases, the firm owner's utility curves for hiring the family or the nonfamily manager both shift upwards; in particular, the dashed curve representing the family manager draws closer to the solid curve representing the nonfamily manager (Figure 6-1-2). That is, as the non-economic task can be better contracted, the firm owner's utility difference between hiring a family versus a nonfamily manager reduces. This can be explained by the fact that effort misallocation is mitigated for both managers if the performance measure gets improved. As a result, the firm owner's utility of hiring a family manager will converge to her utility of hiring the nonfamily manager. However, as long as the non-economic goals cannot be perfectly measured, the nonfamily manager will always be preferred.

Figure 6-1: Hiring decision: symmetric abilities and different levels of distortion

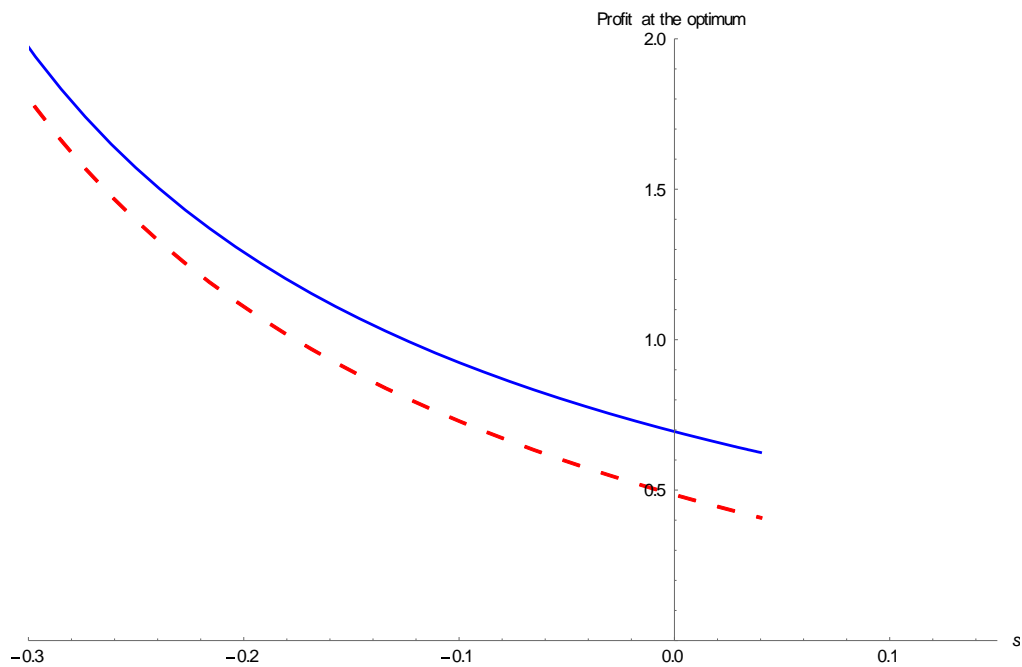


Figure 6-1-1: $\alpha = 0.1$

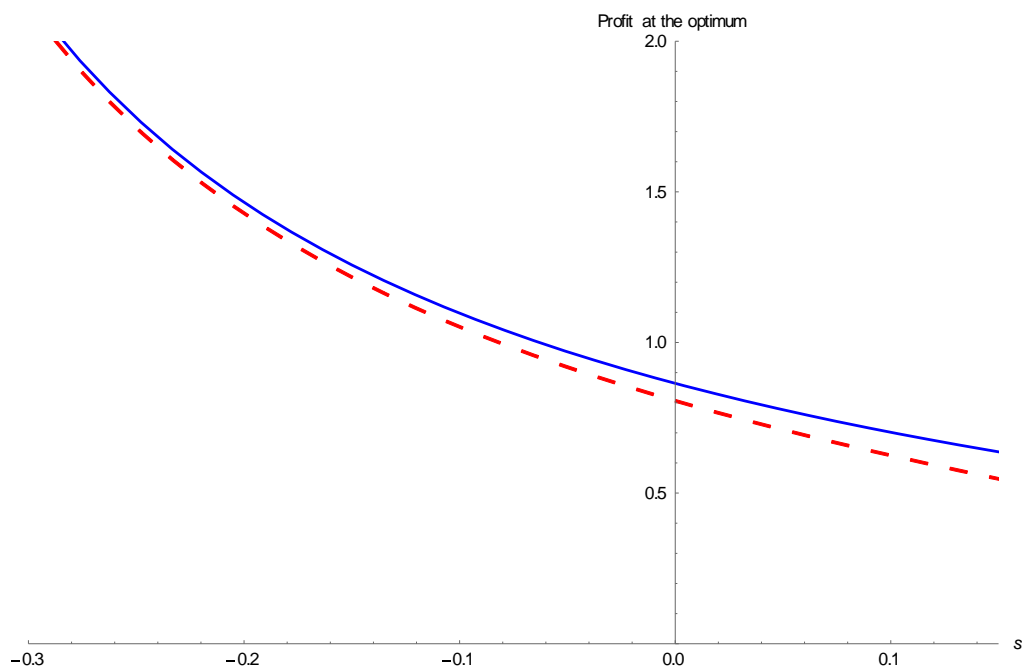


Figure 6-1-2: $\alpha = 0.4$

Notes: $\hat{\pi}_N$ (solid) and $\hat{\pi}_F$ (dashed) with $D_N = d_F = 0.4, d_N = D_F = 0.7, \theta_F = 0$.

6.6.2 Asymmetric abilities

This subsection considers a scenario where the managers' abilities are asymmetric in the sense that the family manager is relatively more capable than the nonfamily manager, i.e., $D_F + d_F < D_N + d_N$. Specifically, this section assumes that the family manager's ability of doing task 2 is higher than the nonfamily manager's ability of doing task 1 ($d_F < D_N$).³⁶ In Figures 6-2-1, 6-2-2 and 6-2-3, it is set that $D_N = 0.5$, $d_F = 0.4$, $d_N = D_F = 0.7$, $\theta_F = 0$ and the level of α is varied from 0.1 to 0.75.

In contrast to the symmetric case, this section finds that the firm owner's hiring decision upon hiring a family or a nonfamily manager depends not only on task interdependence s but also on performance measure α . Figure 6-2-1 considers a situation where α is relatively low. The figure shows that if the two tasks are highly complementary, i.e. s is relatively small, the family manager will be preferred over the nonfamily manager. Intuitively, if doing one task enables the manager to do another task, the more capable manager will be hired. However, as s increases, the firm owner's utilities of hiring the family or the nonfamily manager converge, and if $s > 0$, the nonfamily manager will be preferred over the family manager.

In Figure 6-2-2, a relatively higher performance measure ($\alpha = 0.3$) is chosen. It shows that the nonfamily manager will be hired for a greater level of s than that in Figure 6-2-1. That is, as the performance measure gets improved, the family manager, who is more capable of doing task 2, will be more likely to get hired. The intuition is straightforward: under an improved performance measure, the family manager's relatively higher ability enables him to contribute more to firm value, thereby increasing the likelihood of him being chosen as the manager. Moreover, for a sufficiently large α ($\alpha = 0.75$), Figure 6-2-3 shows that hiring the family manager will always be the optimal solution for any given s .

³⁶ In this case, $D_i\alpha^2 < d_i$, that is, the family manager's ability regarding the non-economic goals is not too large. In other words, the family manager is more capable than the nonfamily manager, but the ability difference between these two managers shall not be too large.

Figure 6-2: Hiring decision: asymmetric abilities and different levels of distortion

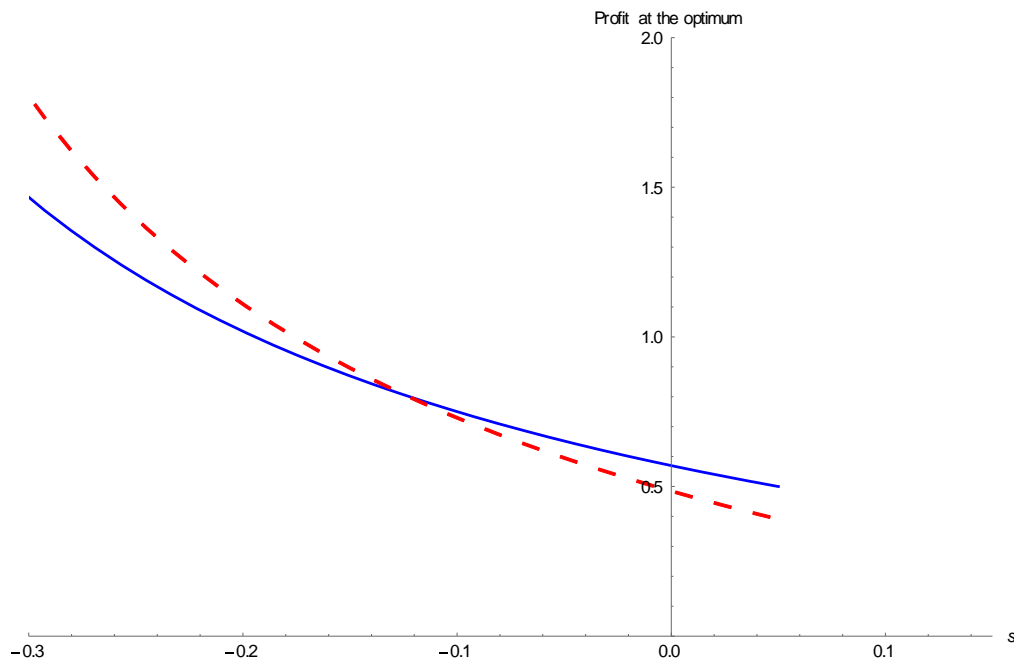


Figure 6-2-1: $\alpha = 0.1$

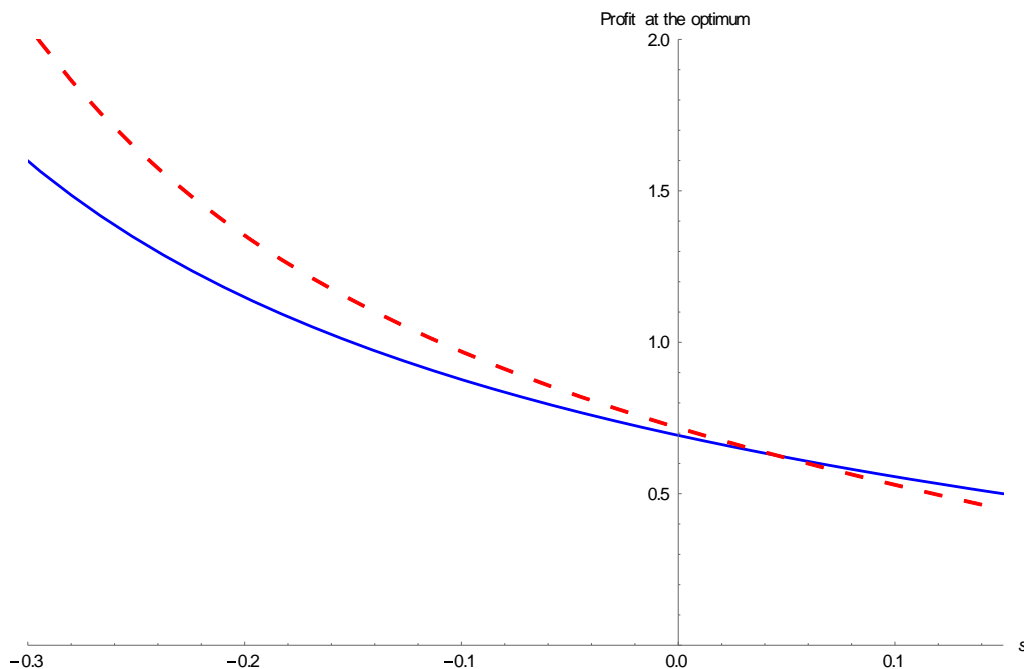


Figure 6-2-2: $\alpha = 0.3$

Notes: $\hat{\pi}_N$ (solid) and $\hat{\pi}_F$ (dashed) with $D_N = 0.5, d_F = 0.4, d_N = D_F = 0.7, \theta_F = 0$.

Figure 6-2 (continued): Hiring decision: asymmetric abilities and different levels of distortion

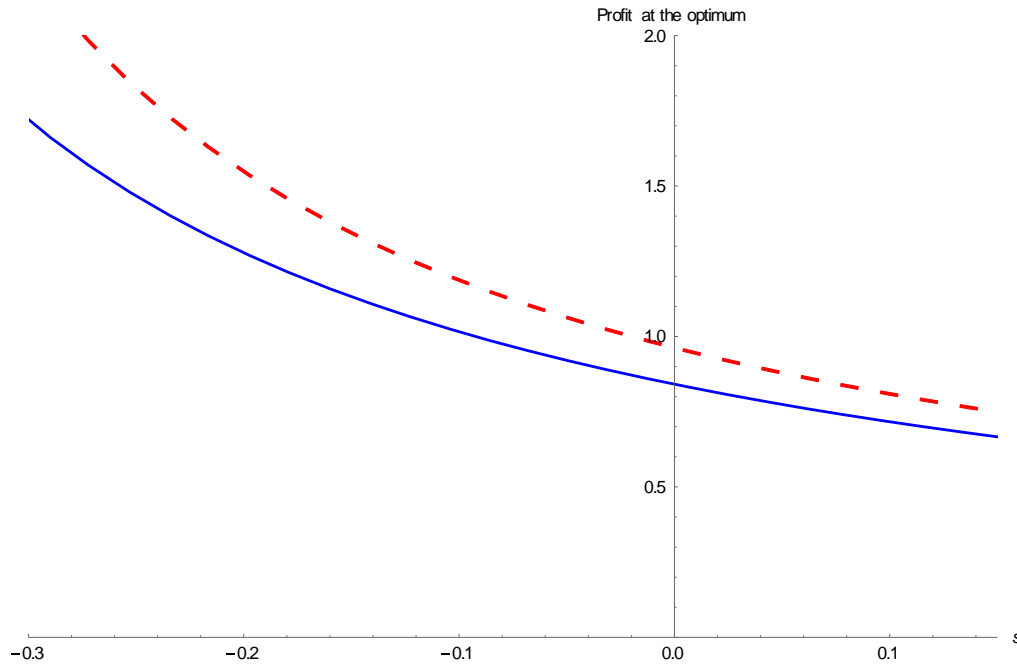
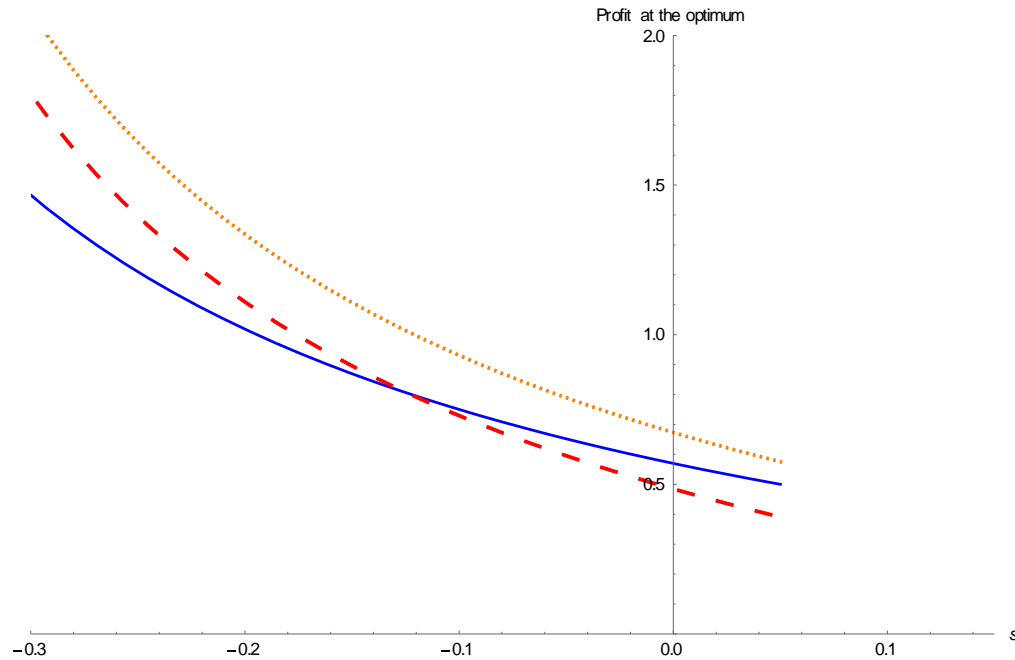


Figure 6-2-3: $\alpha = 0.75$

Notes: $\hat{\pi}_N$ (solid) and $\hat{\pi}_F$ (dashed) with $D_N = 0.5, d_F = 0.4, d_N = D_F = 0.7, \theta_F = 0$.

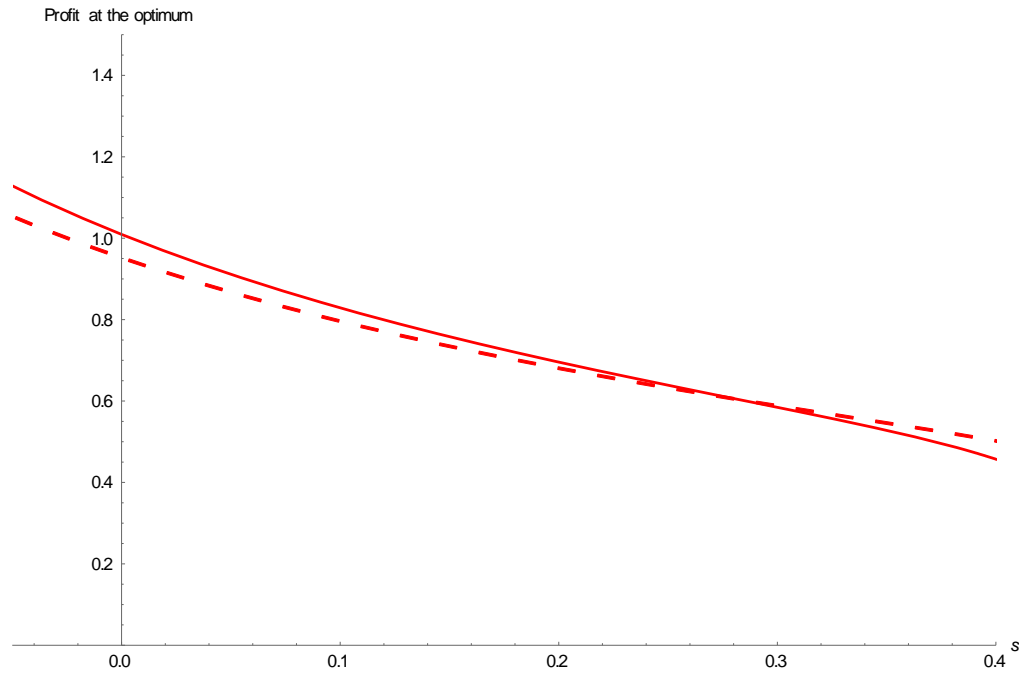
The above cases show the impact of α on the firm owner’s hiring decision while in Figure 6-3, the focus is on the influence of θ_F , namely how the family manager’s valuation of the family firm affects the owner’s hiring decision. In Figure 6-3 it is set that $D_N = 0.5, d_F = 0.4, d_N = D_F = 0.7, \alpha = 0.1$, and the magnitude of θ_F is varied from 0 to 0.075. The solid curve refers to the nonfamily manager, whereas the large dashed and small dashed curves represent family managers with lower and higher levels of personal valuation of the family firm’s welfare, respectively. One can observe that the firm owner’s utility curve for hiring the family manager shifts upwards as θ_F increases, as is proved in Lemma 6. As a result, the firm owner’s hiring decision will depend on θ_F and s . More specifically, the family manager will be more likely to get hired if he attaches a high value of θ_F onto the family firm, or if the two tasks are highly complementary.

Figure 6-3: Hiring decision: asymmetric abilities and different levels of personal valuation of the family firm



Notes: $\hat{\pi}_N$ (solid), $\hat{\pi}_F$ ($\theta_F = 0$; large dashed) and $\hat{\pi}_F$ ($\theta_F = 0.075$; small dashed) with $D_N = 0.5, d_F = 0.4, d_N = D_F = 0.7, \alpha = 0.1$.

Finally and beyond the purpose of the current paper, it is worth noting a final case which this model in general also allows to discuss and that highlights an interesting result. Suppose that the firm owner has to make a choice between two managers of the same type. Then this model shows that counterintuitively, the firm owner may prefer to hire the generally less efficient manager if tasks are highly substitutable. Consider such a case for two family managers: family manager 1 has a higher ability than family manager 2 in the economic task ($D_{F1} < D_{F2}$), but both managers have an equal ability in performing the non-economic task ($d_{F1} = d_{F2}$). For simplicity, assuming that $D_{F1} = 0.6, D_{F2} = 0.7, d_{F1} = d_{F2} = 0.4, \alpha = 0.7$, and $\theta_F = 0$. This case is presented in Figure 6-4.

Figure 6-4: Hiring decision: two managers of the same type

Notes: $\hat{\pi}_{F1}$ (solid) and $\hat{\pi}_{F2}$ (dashed) with $D_{F1} = 0.6$, $D_{F2} = 0.7$, $d_{F1} = d_{F2} = 0.4$,
 $\alpha = 0.7$, $\theta = 0$.

Figure 6-4 can be explained by referring to lemmas that are presented in the previous section. According to Lemma 7 i)a), all else being equal, the more productive family manager 1 exerts more effort in the economic task than family manager 2, because the former has higher ability in task 1. With respect to task 2, Lemma 7 ii)b) indicates that for a relative small s , the family manager 1's effort level in task 2 is higher, but for a relatively large s , the family manager 2's effort in task 2 will be higher. Meanwhile, intuitively, the firm owner can lower incentive pay if the manager's ability is higher (D_i is lower); hence, hiring the family manager 1 saves cost for the firm owner. The impacts of effort levels and piece-rate all together lead to the result that the family manager 1 will be hired if tasks are complements ($s < 0$). However as s increases, the family manager 1's ability advantage gradually vanishes, and the family manager 2 will be preferred.

6.7 Discussion

This study analyzes a family firm's optimal hiring decision between a family manager and a nonfamily manager by using a multitask principal-agent model. In this model, the manager's two

tasks are specified by incorporating the concept of family firm's economic and non-economic goals; each manager is assigned with two tasks to fulfil the respective two goals. With this model, three determinants of the family firm's hiring decision are investigated: task interdependence between the two goals (reflected by the two tasks), the measurement of non-economic tasks, and each manager's ability regarding the two tasks. The model results show that the family firm owner needs to weigh the trade-off between the manager's ability of fulfilling the economic and non-economic goals and the measurability of the non-economic goals when facing the hiring decision between family and nonfamily managers. Moreover, it shows that task interdependence affects the firm owner's hiring decision.

In a simplified case in which family and nonfamily managers have symmetric abilities of accomplishing economic and non-economic goals, the nonfamily manager is always the optimal option for the firm owner. This preference towards the nonfamily manager results from his higher competence of doing economic tasks which can be perfectly measured, while the family manager is not chosen because the task he is good at cannot be fully observed and compensated. This finding offers a new explanation for the recruitment of nonfamily managers in family firms. Previous literature on the inclusion of nonfamily managers has pointed out that nonfamily managers are preferred by large, international, and innovative family firms (Lee et al., 2003; Vandekerckhof et al., 2015), or family firms with a high percentage of independent directors (Ansari et al., 2014). This study adds to the relevant literature a new factor, the measurability of the non-economic goals, to explain why the nonfamily manager is preferred over the family manager.

Furthermore, this study analyzes a case where family and nonfamily managers have asymmetric abilities; in particular, the family manager is relatively more competent than the nonfamily manager. The findings of this model show that task interdependence and performance measurability influence the firm owner's hiring decision between a family and a nonfamily manager. Moreover, this study shows that even the family manager is more competent than the nonfamily manager, he is less likely to be hired if the two tasks become more substitutable. However, improving the quality of the performance measure increases the likelihood of the family manager being hired. This model sheds light on discussions regarding the recruitment of family or nonfamily managers in academics by providing a new explanation why family firms stick to family members as top managers even though they are not as qualified (in terms of economic goals) as outside nonfamily candidates. That is, it can be a rational and utility-maximizing choice for firm owners to hire the

family manager if the two tasks are highly complements or if the non-economic goals can be better measured. With these results, this study contributes to prior research about top management hiring decisions in family firms (Chrisman et al., 2014; Vandekerkhof et al., 2015; Salvato et al., 2012). It should be noted that the preference for the family candidate is not due to other reasons such as nepotism (Jaskiewicz et al., 2013), exploitation of minority shareholders (Morck and Yeung, 2003), the family firm's inability to attract good nonfamily candidates (Chrisman et al., 2014) or irrational decision making of family owners (Kets de Vries, 1993). As regards to nonfamily manager, the more the tasks of fulfilling economic and non-economic goals are substitutable, the higher the likelihood of him getting hired over the family manager. These findings help to understand why in some industries and some family contexts the family manager is the preferred and optimal choice, whereas in other circumstances the nonfamily manager is preferred.

Next to the literature of top management hiring decisions in family firms, this study also contributes to the discussion on how family firm's economic and non-economic goals interrelate with each other and how this interrelationship influences hiring decisions in family firms. In the conceptual work of Martin and Gómez-Mejía (2016), they posit that the relationship between family firms' financial performance and the five dimensions of socioemotional wealth (SEW) can be positive or negative, i.e., the pursuit of economic goals can detriment the preservation of SEW, as many previous studies have assumed (Berrone et al., 2010; Gómez-Mejía et al., 2007; Stockmans et al., 2010), but can also increase SEW. This study features this association between family firms' economic goals and non-economic goals in a multitask principal-agent model and assumes that the two types of goals can be substitutes or complements. The findings of this study extend our knowledge of managers' behavior by examining how the relationship between these two types of goals affects the managers' effort allocation between the two tasks that are relevant to the fulfilment of the firms' goals. Furthermore, previous studies have investigated the influence of pursuing SEW on earnings management (Stockmans et al., 2010), diversification decisions (Gómez-Mejía et al., 2010), decisions on joining a cooperative (Gómez-Mejía et al., 2007), incentive compensation (Memili et al., 2013) and environment policy (Berrone et al., 2010), this study contributes to relevant literature by showing that pursuing non-economic goals can also affect a family firm's hiring decision between family and nonfamily managers.

6.8 Future research

The model offers several interesting avenues for further research. First, this model is about the selection of a single family or nonfamily manager. The model could be extended to the case of management teams, where both family and nonfamily managers prevail (Patel and Cooper, 2014). In this case, the family owner being principal hires two or more managers, rather than hiring only one person. Taken into account possible group conflicts and cooperation opportunities, future research can look at how the family firm's decision can be made upon the hiring of management teams.

Second, this study accounts for the reciprocal emotion of the family manager to his family business as a positive impact, based on the fact that family members are likely to inherit the family businesses once the incumbent retires. However, family members may also generate some negative emotion against the family firm when working in it. For instance, Norman Waterman, president of a construction family business, feels that "the emotional ties to his family impede his ability to run his company effectively" (Brännback and Carsrud, 2012, p. 69). These negative feelings generated from family conflict or the heir's unwillingness to take over the business may affect the family manager's effort input and consequently, the firm owner's hiring decision.

Third, another avenue for future research will be to extend the model to cases where several principals with different objectives exist. For instance, nonfamily owners in family firms do not regard the family's non-economic goals as important target, therefore they may be against projects that support non-economic goals but do not help increase the firm's economic value. This potential rising conflict between family and nonfamily shareholders may also affect the family firm's hiring decision between family managers and nonfamily managers.

7 Summary and practical implications

This chapter summarizes findings in each chapter and answers research questions that are proposed in Section 1.2, and then provides practical implications for relevant stakeholders.

7.1 Summary

Chapter 2 replies to **RQ 1**, which concerns how an individual's work experience affects one's entry mode choice between new venture start-up and business takeover. Using a sample of 29,489 French new venture creators and business acquirers, Chapter 2 examines the effects of small firm experience, management experience, and sector experience on entrepreneurship entry mode. A Heckman selection model is conducted to deal with selection bias. The findings are threefold. First, small firm experience from previous paid employment increases the likelihood for business takeover entry mode. This study argues that the non-financial aspects of entrepreneurship play an important role in motivating large firm employees to start new ventures (Garvin, 1983; Millán et al., 2013), while small firm employees can better use accumulated experience and networks to run an already established business (O'Gorman et al., 2005; Elfenbein et al., 2010; Gompers et al., 2005). Second, the finding that same sector experience promotes new venture start-up is in line with the finding of Bastié et al. (2013). Third, management experience increases the likelihood for new venture start-up entry mode. This finding is contradictory to what Bastié et al. (2013) and Parker and Van Praag (2012) have found, suggesting further analyses are needed regarding the effect of management experience.

In reply to **RQ 2**, **Chapter 3** selects a sample of 9,032 hybrid entrepreneurs through which to investigate the relationship between individual-level and firm-level characteristics and entrepreneurship entry mode. The main findings indicate that each entry mode is associated with particular factors regarding the profiles of entrepreneurs as well as the profiles of the firms they choose. First, the Heckman regression results show that hybrid entrepreneurs who were formerly senior managers or liberal professionals tend to choose new venture start-up as an entrepreneurship entry mode. By contrast, workers and individuals who have received social benefit are more likely to take over an existing firm. In line with previous research this chapter finds that higher educational attainment leads to new venture start-up (Bastié et al., 2013; Block et al., 2013b; Parker and Van Praag, 2012).

In addition, female hybrid entrepreneurs prefer business takeover to new venture start-up. Finally, with respect to firm characteristics, takeovers require greater start-up capital, while new venture start-ups are more dependent on self-funding and public aid. Moreover, urban entrepreneurs are more likely than rural entrepreneurs to start a new venture rather than taking over an existing firm.

Chapter 4 answers **RQ 3.1** and **RQ 3.2**. In contrast to previous studies that mainly focus on newly founded firms, this chapter analyzes separately survival rates for new venture start-ups and business takeovers. It then compares those individual- and firm-level determinants across these two types of entrepreneurship entry modes. This chapter uses a large sample of business takeovers and new ventures start-ups over an observation period of 68 months to perform survival analysis. With respect to **RQ 3.1**, this chapter shows that business takeovers survive longer than new venture start-ups (Bates, 1990; Dyke et al., 1992). Furthermore, before comparing survival determinants between new venture start-ups and takeovers, this chapter uses propensity score matching to construct a sample of new venture start-ups that has similar characteristics to business takeovers. Afterwards, using this selected sample and the takeover sample, this study conducts a Cox regression analysis to examine the survival determinants for these two types of entrepreneurs.

In terms of **RQ 3.2**, **Chapter 4** finds that some individual and firm characteristics affect the survival chances of new venture start-ups and takeovers in similar ways. In line with previous research, educational attainment, same sector experience, and long-term orientation are positively linked to the survival chances for new venture start-ups and takeovers (Bates, 1990; Bosma et al., 2004; Boyer and Blazy, 2014; Cooper et al., 1994; Ganotakis, 2012; Gimeno et al., 1997). Moreover, entrepreneurs aged 35 to 49 years are more likely to keep their business alive, regardless of whether these firms are newly created or acquired. With respect to firm-level characteristics, urban firms are more likely to exit than rural located firms. In spite of the similarities regarding the survival determinants across the two types of entrepreneurship, this chapter identifies three factors that influence the survival chances for business takeovers and comparable new venture start-ups (matched sample) in distinctive ways. First, an entrepreneur's small firm experience increases the survival rates for new venture start-ups, but does not affect business takeovers. Second, new firm creators whose entrepreneurial motivation involves opportunity seeking are more successful than those who are forced into entrepreneurship. In contrast, such a relationship does not exist for business acquirers. Third, this chapter finds a negative association between a takeover's public aid and its survival chance, while for new venture start-ups public aid has an insignificant effect.

Chapter 6 presents a multitask principal-agent model incorporating family firm goals to analyze top management hiring decisions in family firms. In this model, each agent (manager) is assigned with two tasks that are related to fulfilling the firm's economic goals and the family's non-economic goals. The results show that a family and nonfamily manager's differences in ability, in terms of performing the economic task and the non-economic task, the interdependence between these two tasks, and the measurability of the non-economic task explain why a family or nonfamily manager is hired. More specifically, if the family and the nonfamily manager have symmetric abilities, i.e., each manager is equally good at doing one task and equally bad at doing the other task, the nonfamily manager will always be the optimal option for family firms if not the family manager exhibits intrinsic care for the firm. However, if both managers have asymmetric abilities, e.g., in this chapter it considers a case in which the family manager is generally more competent than the nonfamily manager, the model results show that, surprisingly, the family firm will not always prefer the family manager even if he has generally higher abilities. In this case, the firm owner's hiring decision not only depends on the managers' ability differences, but also relies on the relationship between the managers' two tasks and the measurability of the non-economic task. If the economic and non-economic tasks are strong substitutes, a nonfamily manager will likely be hired. In contrast, the more complementary the two tasks become, the more likely that a family manager will be hired. Moreover, hiring a family manager becomes optimal when the non-economic task can be better measured.

7.2 Practical implications

This dissertation provides practical implications for individuals who intend to be or already are involved in entrepreneurial activities, for entrepreneurs who plan to transfer their business to the next generation, as well as for policy makers.

Individuals with entrepreneurial intention. This study addresses taking over an existing firm as a distinguished entrepreneurship path that is disparate to creating a new firm from scratch (Chapter 2 and Chapter 3). In light of this, people who have entrepreneurial interest can extend their entry method into self-employment from starting a new firm to purchasing an existing firm. Moreover, Chapter 4 shows that in terms of survival chances, acquired firms persist longer than new venture start-ups. Existing firms are more successful since they are likely to be comprised of established operations, skillful employees, and a customer base that remain after previous owners

depart (Bastié et al., 2013; Bates, 1990; Dyke et al., 1992). Instead of starting a new firm that needs time to develop, business acquirers can utilize existing establishments and resources in the firm to fulfill their entrepreneurial objectives. Therefore, this study suggests individuals consider business takeover as an option to enter into entrepreneurship if there is a chance.

Family firm owners. In Chapter 6, a multitask principal-agent model is implemented to analyze a family firm's optimal hiring decision between a family and nonfamily manager. The implications of the findings for family firm owners are twofold. First, family firms should improve the quality of measuring the family's non-economic goals in order to better incentivize managers as well as to increase the firm's overall utility. Moreover, if the family firm has an inclination for hiring family members as new managers, improving the quality of the performance measure can help the family manager to concentrate on what he or she is good at, thereby allowing him or her to contribute more to the family firm. Second, family firms need to consider the interrelationship between economic and non-economic tasks when deciding whether or not to hire a family or non-family manager. Given a case in which the family manager is in general more capable than the nonfamily manager, as the economic and non-economic tasks become more complementary, a manager from within the family circle is more likely to be an optimal option. On the contrary, the nonfamily manager is more likely to be a better choice if the two tasks become more substitutable. That is, if the firm's expectations regarding its financial objectives and the family's non-economic goals are conflicting, hiring a nonfamily manager, who is more rational and capable of performing the economic task, will be a better choice than a family manager. Recall the case of the Ahlström family introduced in Section 6.1: Shutting down a traditional family business deviates from the family board's intention, making it difficult for the family manager to proceed with his reform plans in the family firm. In this case, the task of reducing cost and the task of preserving traditional business are substitutable for the family manager. Despite the fact that the family manager shares the same value with the family, a nonfamily manager who can, in case of tasks being substitutes, better focus on the financial performance may be an optimal choice to safeguard the family business through turmoil.

Family managers. The analysis on the family firm's optimal hiring decision in Chapter 6 highlights two ways to increase the chances of hiring a family manager. According to Hall and Nordqvist (2008), managers in family firms need the ability to realize financial profit, understand the family's values, and fulfill family goals. As regards to family managers, increasing his or her

ability to perform the economic task will increase the effort level in that task, thereby increasing the firm's financial profit and the likelihood of family managers being hired. The managerial ability can be enhanced through education and work experience in and outside the family firm (Fairlie and Robb, 2007; Le Breton-Miller et al., 2004). Furthermore, the findings of this dissertation show that family members who are more identified with the family firm and intrinsically caring for family welfare will be more likely to be hired. Such an emotional attachment to the family firm mitigates goal misalignment and reduces agency conflict between the family manager and the firm owner, which can compensate for a relatively lower managerial ability.

Nonfamily managers. Chapter 6 highlights situations in which nonfamily managers are a better choice than family managers to manage family firms. In line with the implications for family managers, improving the nonfamily manager's ability regarding the economic task will increase one's chance of being selected as the new manager. Moreover, nonfamily managers should also try to enhance their ability to perform the family's non-economic task. This can be done through strengthening communication with the family, attending the family's formal or informal meetings, and participating in family activities like family gatherings (Blumentritt et al., 2007). Moreover, results in Chapter 6 show that when the two tasks are highly substitutable, nonfamily managers are an optimal choice for family firms. This finding implies that family managers have higher chances of being recruited provided that the family firm has competing tasks that exclude each other. For example, if the family firm has conflicting goals between the pursuit of financial performance and the protection of family value, it is better off choosing a nonfamily manager to avoid family disputes, such that this outsider can increase the family's overall utility. In order to find a suited position, nonfamily managers should consult the family firm's attitude towards firm goals when searching for positions in family firms.

Policy makers. This dissertation provides several important implications for policy makers. First, business ownership transfer has been a focus of EU entrepreneurship policy, and several proposals have been initiated to facilitate the business transfer process, including (inheritance) tax reduction, training courses, and financial support (European Commission, 2012). The findings of Chapter 2 and Chapter 3 suggest that business takeover is preferred as a mode of entry for individuals with certain profiles. Chapter 2 implies that the likelihood of taking over an existing firm is higher for small firm employees. Chapter 3 shows that amongst others, females and workers prefer business takeover to new venture start-up. In light of the differences in profiles of new firm creators

and business acquirers, policy makers should distinguish between these two types of entrepreneurs and provide them with tailored entrepreneurship training programs to facilitate start-up as well as business transfer. In addition, Chapter 4 shows that public aid towards business takeovers has a negative effect on firm survival, which raises concerns for financial policies that aim at improving entrepreneurship. On one hand, the efficiency of public aid should be evaluated separately for business takeovers and new venture start-ups. On the other hand, specialized training programs should be designed for business acquirers to assist them in successfully transferring business ownership and further developing the business. Furthermore, the finding that urban and rural entrepreneurs choose different entrepreneurship entry modes and have different survival chances suggest that policy measures regarding entrepreneurship should be differentiated across regions.

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Appendix

Table A2-1: List of variables

Variable	Description	Used in chapter
Business takeover	Dummy =1 if the entrepreneur has taken over a firm from outside; dummy = 0 if the entrepreneur has started a new venture (Q5/7/17).	2, 3, 4
Survival months	The number of months between the new venture or takeover's creation or acquisition and its cessation.	4
<i>Type of work experience from previous paid employment</i>		
Small firm experience	Dummy =1 if the entrepreneur has principal work experience gained from firm(s) with less than 50 employees (Q9).	2, 3, 4
Medium firm experience	Dummy =1 if the entrepreneur has principal work experience gained from firm(s) with 50 to 249 employees (Q9).	2, 3, 4
Large firm experience	Dummy =1 if the entrepreneur has principal work experience gained from firm(s) with over 250 employees (Q9).	2, 3, 4
Management experience	Dummy =1 if the entrepreneur has worked as a CEO or a senior manager prior to entrepreneurship (Q5/6).	2, 4
Same sector experience	Dummy =1 if the entrepreneur has worked in the same sector before (Q10).	2, 3, 4
<i>Entrepreneur's prior occupation</i>		
CEO	Dummy =1 if the entrepreneur was a CEO prior to entrepreneurship (Q5/6).	3
Self-employed	Dummy =1 if the entrepreneur was self-employed prior to entrepreneurship (Q5/6).	3
Senior manager, liberal professional ^a	Dummy =1 if the entrepreneur was a senior manager or liberal professional prior to entrepreneurship (Q5/6).	3
Worker	Dummy =1 if the entrepreneur was a worker prior to entrepreneurship (Q5/6).	3
Not-working	Dummy =1 if the entrepreneur was not working or was a student prior to entrepreneurship (Q5/6).	3
Other types of employees	Dummy =1 if the entrepreneur was a regular employee prior to entrepreneurship (Q5/6).	3
<i>Educational attainment</i>		
No diploma	Dummy =1 if the entrepreneur had no diploma at the entry time (Q4).	2, 3, 4
Lower than A-level diploma	Dummy =1 if the entrepreneur had lower than A-level diploma at the entry time (Q4).	2, 3, 4
A-level diploma	Dummy =1 if the entrepreneur had A-level diploma at the entry time (Q4).	2, 3, 4
A-level plus two years education	Dummy =1 if the entrepreneur had A-level diploma plus two years education at the entry time (Q4).	2, 3, 4

Notes: Q=Question in the SINE questionnaire. Liberal professionals include lawyers, notaries, engineers, architects, doctors, dentists, and accountants (European commission definition).

Table A2-1 (continued): List of variables

Variable	Description	Used in chapter
<i>Educational attainment</i>		
A-level plus over two years education	Dummy =1 if the entrepreneur had A-level diploma plus more than two years education at the entry time (Q4).	2, 3, 4
Received entrepreneurial training	Dummy =1 if the entrepreneur has received specific training for his or her business (Q21).	2, 3, 4
<i>Support for entrepreneurship</i>		
Entrepreneurs in close relational circle	Dummy =1 if the entrepreneur had business leaders or self-employed people in his or her close relational circle (Q12).	2, 3, 4
Received social benefit	Dummy =1 if the entrepreneur has received social benefit (Q8).	2, 3, 4
Sole entrepreneur	Dummy =1 if the entrepreneur started the business by him or herself (Q19).	2, 4
<i>Entrepreneurial motivation and ambition</i>		
Full-time entrepreneurship	Dummy =1 if the entrepreneur claimed not to be involved in any other business activities in addition to his or her entrepreneurial project (Q14).	4
Motivation: new idea of product or marketing	Dummy =1 if the entrepreneur had a new idea of product or marketing (Q18).	2
Motivation: independent	Dummy =1 if the entrepreneur wanted to be independent (Q18).	2
Motivation: a sense of entrepreneurship	Dummy =1 if the entrepreneur had a sense of entrepreneurship (Q18).	2
Motivation: opportunity	Dummy =1 if the entrepreneur discovered a business opportunity (Q18).	2
Motivation: entrepreneurs in entourage	Dummy =1 if the entrepreneur had in the entourage successful examples of entrepreneurs (Q18).	2
Motivation: unemployed and chose entrepreneurship	Dummy =1 if the entrepreneur was unemployed and then chose to build a business (Q18).	2
Motivation: unemployed and constraint	Dummy =1 if the entrepreneur was unemployed and constraint (Q18).	2
Motivation: other reasons	Dummy =1 if the entrepreneur had other reasons to enter into entrepreneurship (Q18).	2
Entrepreneurial motivation: opportunity motivation	Dummy =1 if the entrepreneur chose entrepreneurship because s/he had a new business idea or discovered a business opportunity (Q18).	4
Entrepreneurial motivation: necessity motivation	Dummy =1 if the entrepreneur reported to be forced into entrepreneurship (Q18).	4
Entrepreneurial motivation: mixed motivation of opportunity and necessity	Dummy =1 if the entrepreneur felt constraint, but proactively chose entrepreneurship (Q18).	4

Notes: Q=Question in the SINE questionnaire. Liberal professionals include lawyers, notaries, engineers, architects, doctors, dentists, and accountants (European commission definition).

Table A2-1 (continued): List of variables

Variable	Description	Used in chapter
<i>Entrepreneurial motivation</i>		
Growth ambition	Dummy =1 if the entrepreneur's primary goal was to develop his or her business; dummy = 0 if the primary goal was to ensure his or her own job (Q16).	2, 3, 4
Long-term entrepreneurship	Dummy =1 if the entrepreneur was long-term oriented to be an entrepreneur (Q15).	2, 3, 4
<i>Socio-demographic status</i>		
Age under 35	Dummy =1 if the entrepreneur was less than 35 years old at the entry time (Q1).	2, 3, 4
Age between 35 and 49	Dummy =1 if the entrepreneur was between 35 and 49 years old at the entry time (Q1).	2, 3, 4
Age over 50	Dummy =1 if the entrepreneur was over 50 years old at the entry time (Q1).	2, 3, 4
Female	Dummy =1 if the entrepreneur is female (Q2).	2, 3, 4
French	Dummy =1 if the entrepreneur is French (Q3).	2, 3, 4
<i>Firm-level characteristics</i>		
No innovation	Dummy =1 if the firm was not innovative (Q36).	2, 4
Product innovation	Dummy =1 if the firm introduced new products, sales concepts and services to the market (Q36).	2, 4
Process innovation	Dummy =1 if the firm introduced new production processes or new methods (Q36).	2, 4
Organizational innovation	Dummy =1 if the firm has implemented a new organizational method in business practice (Q36).	2, 4
Start-up capital: <2k	Dummy =1 if the start-up capital was less than 2,000 € (Q23).	2, 3, 4
Start-up capital: 2-16k	Dummy =1 if the start-up capital was from 2,000 € to less than 16,000 € (Q23).	2, 3, 4
Start-up capital: 16-80k	Dummy =1 if the start-up capital was from 16,000 € to less than 80,000 € (Q23).	2, 3, 4
Start-up capital: >80k	Dummy =1 if the start-up capital was more than 80,000 € (Q23).	2, 3, 4
Received public aid	Dummy =1 if the firm has received public aid (Q27).	2, 3, 4
Percentage of self-funding	The percentage of self-funding or funding from families or associates in the total amount of start-up capital (Q25).	2, 3, 4
<i>Other control variables</i>		
Industry dummies	9 industries: Agricultural food, non-agricultural food, construction, commerce, transport, real estate, business services, personal services, education, health and social work. The definition is based on French Classification of Activities (NAF).	2, 3, 4
Region dummies	26 regions: Alsace, Aquitaine, Auvergne, Basse-Normandie, Bourgogne, Bretagne, Centre, Champagne-Ardenne, Corse, Franche-Comté, Guadeloupe, Guyane, Haute-Normandie, Île-de-France, Languedoc-Roussillon, La Réunion, Limousin, Lorraine, Martinique, Midi-Pyrénées, Nord-Pas-de-Calais, Pays de la Loire, Picardie, Poitou-Charentes, Provence-Alpes-Côte d'Azur, Rhône-Alpes.	2
Urban	Dummy =1 if the new venture or takeover occurred in a predominantly urban region.	3, 4

Notes: Q=Question in the SINE questionnaire. Liberal professionals include lawyers, notaries, engineers, architects, doctors, dentists, and accountants (European commission definition).

Table A2-2: Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	VIF
1 Business takeover																		1.36
2 Medium firm experience	-0.03																	1.08
3 Large firm experience	-0.03	-0.15																1.19
4 Management experience	-0.06	0.10	0.20															1.48
5 Same sector experience	-0.05	-0.05	-0.14	-0.03														1.10
6 Lower than A-level diploma	0.07	-0.06	-0.15	-0.27	0.04													2.52
7 A-level diploma	0.02	-0.02	-0.01	-0.01	-0.04	-0.37												2.05
8 A-level plus two years education	-0.02	0.06	0.07	0.04	-0.05	-0.29	-0.16											1.83
9 A-level plus over two years education	-0.07	0.09	0.25	0.43	-0.03	-0.38	-0.21	-0.17										2.48
10 Received entrepreneurial training	-0.01	-0.05	-0.08	-0.23	0.02	0.21	0.00	-0.08	-0.20									1.17
11 Entrepreneurs in close circle	-0.01	0.00	-0.02	0.01	-0.01	-0.01	0.03	0.01	0.00	0.04								1.08
12 Received social benefit	-0.04	0.01	-0.04	-0.05	-0.09	0.05	0.00	-0.01	-0.05	0.05	0.01							1.10
13 Growth ambition	0.08	0.00	-0.03	0.05	0.04	-0.01	0.02	0.03	-0.04	0.02	0.05	-0.04						1.21
14 Long-term entrepreneurship	0.02	-0.03	-0.08	-0.11	0.03	0.05	0.00	0.00	-0.07	0.09	0.05	0.01	0.11					1.08
15 Age between 35 and 49	-0.01	0.04	0.02	0.05	-0.03	0.07	-0.05	-0.05	-0.02	-0.02	-0.03	0.04	-0.02	0.06				1.22
16 Age over 50	-0.05	0.03	0.12	0.21	-0.04	-0.05	0.01	-0.02	0.09	-0.12	-0.06	0.02	-0.10	-0.16	-0.34			1.34
17 Female	0.10	0.00	0.01	-0.06	-0.11	-0.08	0.08	0.05	0.08	-0.03	0.01	0.02	-0.10	-0.03	0.00	-0.03		1.10
18 French	0.05	0.04	0.07	0.07	-0.10	0.06	0.07	0.07	0.05	-0.01	0.07	0.00	-0.04	0.01	-0.03	0.03	0.10	1.14
19 Motivation: new idea of product or marketing	-0.08	0.02	0.06	0.12	-0.12	-0.07	0.04	0.05	0.06	-0.05	0.02	0.02	0.14	0.01	0.02	0.01	0.01	1.40
20 Motivation: independent	0.03	-0.03	-0.03	-0.12	0.04	0.03	-0.01	0.00	-0.02	0.08	0.00	-0.04	-0.07	0.09	0.00	-0.17	0.00	1.18
21 Motivation: a sense of entrepreneurship	0.03	0.02	0.03	0.05	-0.01	-0.03	0.04	0.03	0.00	0.03	0.02	-0.05	0.22	0.10	0.00	-0.10	-0.07	1.27
22 Motivation: opportunity	0.15	0.00	0.00	0.01	0.01	-0.01	0.02	0.02	0.02	-0.03	0.02	-0.07	0.07	-0.01	-0.02	-0.02	0.03	1.27
23 Motivation: entrepreneurs in entourage	-0.01	-0.01	-0.04	-0.11	0.06	0.04	0.00	-0.03	-0.07	0.09	0.20	-0.03	0.01	0.02	-0.05	-0.09	-0.04	1.26
24 Motivation: unemployed and chose entrepreneurship	-0.10	-0.01	-0.03	-0.03	-0.08	0.01	-0.01	0.00	-0.02	0.04	-0.01	0.22	-0.12	0.01	0.04	0.07	0.03	1.42
25 Motivation: unemployed and constraint	-0.05	0.00	0.01	0.03	-0.03	0.00	-0.02	0.00	0.01	-0.04	0.00	0.13	-0.10	-0.07	0.00	0.13	0.00	1.13
26 Motivation: other reasons	0.00	0.01	0.02	0.00	0.04	0.01	-0.01	-0.01	0.01	-0.02	-0.05	-0.04	-0.07	-0.05	-0.01	0.04	0.02	1.27
27 Sole entrepreneur	-0.15	0.01	0.05	0.10	0.03	-0.05	-0.02	0.00	0.08	-0.11	-0.08	0.00	-0.13	-0.07	0.01	0.07	-0.05	1.12
28 Product innovation	0.02	0.01	0.06	0.10	-0.10	-0.06	0.04	0.04	0.06	-0.04	0.05	0.04	0.11	0.04	0.00	-0.01	0.04	1.23
29 Process innovation	0.00	0.00	-0.01	0.02	0.03	0.02	0.01	-0.02	0.01	0.04	0.00	0.03	0.09	0.03	-0.01	-0.01	-0.01	1.05
30 Organizational innovation	0.10	0.02	0.00	0.04	-0.01	0.00	0.00	0.01	0.01	0.01	0.03	0.01	0.14	0.02	0.00	0.01	0.00	1.08
31 Start-up capital: 2-16k	-0.23	-0.01	-0.05	-0.04	0.04	0.02	-0.02	0.00	-0.05	0.02	0.01	0.03	-0.05	0.02	0.01	0.00	-0.07	2.06
32 Start-up capital: 16-80k	0.16	0.00	0.01	0.00	-0.05	0.02	0.04	0.00	-0.03	0.06	0.04	-0.03	0.13	0.05	0.00	-0.04	0.03	2.17
33 Start-up capital: >80k	0.38	0.01	0.04	0.12	-0.04	-0.04	0.00	0.02	0.07	-0.03	0.02	-0.05	0.12	0.03	0.02	0.00	0.02	1.84
34 Received public aid	-0.05	-0.02	-0.03	-0.11	-0.09	0.07	0.02	0.02	-0.04	0.19	0.05	0.19	0.00	0.08	0.00	-0.05	0.06	1.26
35 Percentage of self-funding	-0.22	0.04	0.08	0.15	-0.04	-0.14	-0.01	0.07	0.14	-0.12	-0.01	-0.01	-0.07	-0.03	0.02	0.08	-0.05	1.18

Notes: N entrepreneurs = 29,489. Correlation coefficients which are greater than or equal to 0.02 (in absolute value) are significant at 0.1% level. Variance inflation factor (VIF) measures the degree of multicollinearity. The lower the VIF, the less likely that multicollinearity is a concern.

Table A2-2 (continued): Correlation table

	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	VIF
19 Motivation: new idea of product or marketing	0.05																	1.40
20 Motivation: independent	0.01	-0.12																1.18
21 Motivation: a sense of entrepreneurship	0.03	0.05	0.11															1.27
22 Motivation: opportunity	0.03	-0.14	-0.07	-0.07														1.27
23 Motivation: entrepreneurs in entourage	-0.05	-0.16	0.01	-0.05	-0.11													1.26
24 Motivation: unemployed and chose entrepreneurship	-0.02	-0.09	-0.12	-0.21	-0.16	-0.10												1.42
25 Motivation: unemployed and constraint	0.03	-0.05	-0.15	-0.16	-0.07	-0.06	0.09											1.13
26 Motivation: other reasons	0.00	-0.13	-0.10	-0.17	-0.15	-0.12	-0.13	-0.05										1.27
27 Sole entrepreneur	-0.03	-0.03	0.00	-0.04	-0.07	-0.05	0.00	0.06	0.06									1.12
28 Product innovation	0.09	0.33	-0.06	0.06	-0.03	-0.07	0.00	-0.03	-0.07	-0.06								1.23
29 Process innovation	0.03	0.10	0.00	0.05	-0.02	-0.03	-0.02	-0.01	-0.01	0.01	-0.06							1.05
30 Organizational innovation	0.04	0.07	-0.04	0.10	0.01	-0.02	-0.02	0.00	-0.03	-0.02	-0.12	-0.02						1.08
31 Start-up capital: 2-16k	-0.07	-0.02	0.02	-0.02	-0.03	0.05	0.07	0.01	-0.03	0.04	-0.05	0.00	-0.03					2.06
32 Start-up capital: 16-80k	0.08	0.06	-0.02	0.06	0.05	-0.03	-0.04	-0.04	-0.02	-0.13	0.11	0.01	0.03	-0.56				2.17
33 Start-up capital: >80k	0.04	0.03	-0.03	0.07	0.08	-0.02	-0.08	-0.04	0.00	-0.14	0.04	0.01	0.08	-0.32	-0.16			1.84
34 Received public aid	0.10	0.05	0.02	0.01	-0.07	-0.01	0.29	0.06	-0.10	-0.11	0.09	0.03	0.00	0.03	0.11	-0.06		1.26
35 Percentage of self-funding	-0.05	0.04	-0.01	-0.04	-0.03	-0.04	0.09	0.05	0.00	0.09	0.00	-0.03	-0.04	0.14	-0.18	-0.16	-0.10	1.18

Notes: N entrepreneurs = 29,489. Correlation coefficients which are greater than or equal to 0.02 (in absolute value) are significant at 0.1% level. Variance inflation factor (VIF) measures the degree of multicollinearity. The lower the VIF, the less likely that multicollinearity is a concern.

Table A2-3: Determinants of having previous work experience

	Heckman probit model
	Coefficient
Benchmark: no diploma	
Lower than A-level diploma	0.34*** (20.30)
A-level diploma	0.24*** (12.52)
A-level plus two years education	0.40*** (17.94)
A-level plus over two years education	0.20*** (10.59)
Entrepreneurs in close relational circle	0.15*** (12.49)
Benchmark: age under 35	
Age between 35 and 49	0.04** (2.93)
Age over 50	-0.25*** (-14.32)
female	-0.39*** (-30.96)
French	-0.03 (-1.43)
Constant	-0.03 (-1.49)
N entrepreneurs	52,390
Log likelihood	-40,311.03

Notes: This table reports estimation results for the selection regression of the Heckman model. The dependent variable equals one if the individual had previous work experience, zero if s/he had no previous work experience. The variable *female* in the second stage of the Heckman selection model is dropped as this variable shows insignificant effect on entrepreneurship entry mode by previous findings (e.g., Block et al., 2013; Kay and Schlömer-Laufen, 2016; Parker and Van Praag, 2012), while in the above table, it is negatively related to having work experience preceding entrepreneurship. LR test of independent equations ($\rho = 0$): $\chi^2(1) = 2.04$, $\text{Prob} > \chi^2 = 0.1529$. Thus, the null hypothesis cannot be rejected. That is, the unobserved factors that affect the likelihood of getting employment experience prior to entrepreneurship is not related to the chance of choosing business takeover. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; t-statistic in parenthesis.

Table A3-1: Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	VIF
1 Business takeover															1.10
2 CEO	0.06														1.60
3 Self-employed	0.02	-0.11													1.09
4 Senior manager, liberal professional	-0.08	-0.25	-0.11												1.47
5 Worker	0.05	-0.15	-0.06	-0.14											1.21
6 Not-working	-0.02	-0.13	-0.05	-0.13	-0.07										1.19
7 Small firm experience	0.04	0.09	0.05	-0.13	0.05	-0.05									2.33
8 Medium firm experience	0.00	0.05	-0.01	0.06	-0.05	-0.04	-0.43								1.76
9 Large firm experience	-0.06	-0.06	-0.06	0.22	-0.08	-0.05	-0.50	-0.17							1.98
10 Same sector experience	0.02	0.10	0.01	0.05	-0.01	-0.06	0.15	0.02	-0.03						1.10
11 Lower than A-level diploma	0.10	-0.01	0.06	-0.20	0.16	-0.02	0.09	-0.06	-0.12	-0.04					2.43
12 A-level diploma	-0.03	0.04	-0.02	-0.06	-0.06	-0.02	0.07	-0.03	-0.04	-0.04	-0.28				2.31
13 A-level plus two years of education	-0.03	0.00	-0.03	0.00	-0.07	0.00	-0.03	0.07	0.01	-0.06	-0.23	-0.20			2.09
14 A-level plus over two years of education	-0.11	0.00	-0.04	0.34	-0.16	-0.01	-0.19	0.08	0.22	0.10	-0.37	-0.33	-0.26		3.06
15 Received entrepreneurial training	0.00	-0.13	-0.01	-0.12	0.14	0.04	0.05	-0.05	-0.04	-0.02	0.12	0.00	-0.04	-0.11	1.09
16 Age between 35 and 49	0.02	0.05	0.04	0.00	-0.02	-0.08	-0.03	0.03	0.03	-0.02	0.01	-0.01	-0.03	0.01	1.36
17 Age over 50	0.02	0.21	0.02	0.03	-0.06	-0.07	-0.01	0.06	0.00	0.06	0.02	0.02	-0.03	0.00	1.44
18 Female	0.02	-0.20	0.01	-0.06	-0.07	0.06	0.02	-0.05	-0.04	-0.11	-0.02	0.00	0.05	-0.01	1.11
19 French	-0.04	0.05	-0.04	0.07	-0.19	0.00	-0.10	0.07	0.07	-0.05	0.03	-0.04	0.08	0.11	1.12
20 Growth ambition	0.06	0.24	0.02	0.03	-0.04	-0.04	0.06	0.03	0.01	0.02	-0.02	0.07	0.03	-0.07	1.24
21 Long-term entrepreneurship	0.01	0.10	-0.03	-0.07	-0.01	-0.01	0.06	0.03	-0.06	0.03	0.00	0.01	0.06	-0.03	1.07
22 Entrepreneurs in close relational circle	-0.02	0.07	0.02	-0.01	-0.07	0.00	0.06	0.02	-0.05	0.03	-0.02	0.03	0.08	-0.02	1.04
23 Received social benefit	0.02	-0.05	0.04	-0.07	0.05	0.24	0.03	0.00	-0.05	0.02	0.03	-0.01	-0.03	-0.03	1.14
24 Start-up capital: 2-16k	-0.12	-0.09	-0.01	0.00	0.04	0.04	0.06	-0.05	-0.01	-0.04	0.02	0.01	-0.01	-0.04	1.75
25 Start-up capital: 16-80k	0.17	0.09	0.04	0.01	-0.03	-0.03	0.03	0.02	-0.03	-0.03	0.02	0.02	0.01	-0.04	1.70
26 Start-up capital: >80k	0.14	0.25	0.00	0.02	-0.07	-0.06	0.00	0.04	0.03	0.09	-0.02	-0.02	0.03	0.05	1.63
27 Percentage of self-funding	-0.13	-0.11	-0.02	0.08	-0.06	-0.01	-0.03	0.02	0.05	-0.05	-0.12	0.01	0.02	0.12	1.13
28 Received public aid	-0.01	-0.11	-0.01	-0.04	0.04	0.16	0.02	-0.01	-0.03	0.01	0.05	-0.02	0.00	-0.04	1.13
29 Urban	-0.03	0.01	0.00	0.03	-0.03	-0.02	0.02	-0.04	0.04	0.03	-0.05	-0.01	0.01	0.03	1.02

Notes: Number of hybrid entrepreneurs = 9,032. Correlation coefficients that are above 0.04 (in absolute value) are significant at 0.1% significance level. . Variance inflation factor (VIF) measures the degree of multicollinearity. The lower the VIF, the less likely that multicollinearity is a concern.

Table A3-1 (continued): Correlation table

	15	16	17	18	19	20	21	22	23	24	25	26	27	28	VIF
16 Age between 35 and 49	-0.03														1.36
17 Age over 50	-0.08	-0.46													1.44
18 Female	0.04	0.02	-0.05												1.11
19 French	-0.05	0.00	0.00	0.03											1.12
20 Growth ambition	-0.06	-0.01	0.02	-0.13	-0.01										1.24
21 Long-term entrepreneurship	0.01	0.07	-0.08	-0.04	0.02	0.15									1.07
22 Entrepreneurs in close relational circle	-0.02	0.03	-0.05	0.01	0.04	0.06	0.09								1.04
23 Received social benefit	0.02	0.01	-0.02	0.00	-0.07	-0.05	-0.02	-0.03							1.14
24 Start-up capital: 2-16k	0.07	-0.03	-0.04	0.05	-0.04	0.04	0.03	-0.02	0.05						1.75
25 Start-up capital: 16-80k	-0.02	0.01	0.03	-0.05	0.01	0.14	0.05	-0.01	-0.05	-0.45					1.70
26 Start-up capital: >80k	-0.06	0.03	0.09	-0.10	0.04	0.19	0.07	0.08	-0.03	-0.34	-0.15				1.63
27 Percentage of self-funding	-0.04	-0.02	-0.03	0.03	-0.02	-0.07	-0.01	-0.03	-0.05	0.15	-0.12	-0.20			1.13
28 Received public aid	0.13	-0.01	-0.07	0.04	-0.01	-0.03	0.03	0.00	0.25	0.03	0.04	-0.03	-0.10		1.13
29 Urban	-0.03	0.01	0.02	0.00	-0.05	0.03	0.00	-0.01	-0.01	0.05	-0.01	-0.03	0.06	-0.06	1.02

Notes: Number of hybrid entrepreneurs = 9,032. Correlation coefficients that are above 0.04 (in absolute value) are significant at 0.1% significance level. .
Variance inflation factor (VIF) measures the degree of multicollinearity. The lower the VIF, the less likely that multicollinearity is a concern.

Table A3-2: Determinants of hybrid entrepreneurship vs. full-time entrepreneurship

	Heckman probit model	
	Coefficient (standard error)	
<i>Entrepreneur's work experience</i>		
Benchmark: other types of employees		
CEO	0.82 ^{***}	(0.02)
Self-employed	-0.37 ^{***}	(0.03)
Senior manager, liberal professional	0.18 ^{***}	(0.02)
Worker	-0.26 ^{***}	(0.02)
Not-working	-0.81 ^{***}	(0.02)
Benchmark: no prior work experience		
Small firm experience	-0.03	(0.02)
Medium firm experience	0.07 ^{**}	(0.03)
Large firm experience	-0.06 [*]	(0.02)
Same sector experience	-0.28 ^{***}	(0.01)
<i>Entrepreneur's educational attainment</i>		
Benchmark: no diploma		
Lower than A-level diploma	-0.09 ^{***}	(0.02)
A-level diploma	0.08 ^{***}	(0.02)
A-level plus two years of education	0.11 ^{***}	(0.03)
A-level plus over two years of education	0.15 ^{***}	(0.03)
<i>Entrepreneur's socio-demographic status</i>		
Benchmark: age under 35		
Age between 35 and 49	0.02	(0.01)
Age over 50	0.01	(0.02)
Female	-0.02	(0.02)
French	-0.09 ^{***}	(0.02)
<i>Support for the hybrid entrepreneur</i>		
Entrepreneurs in close relational circle	0.01	(0.01)
<i>Firm's financial structure</i>		
Benchmark: start-up capital: <2k		
Start-up capital: 2-16k	-0.09 ^{***}	(0.02)
Start-up capital: 16-80k	-0.29 ^{***}	(0.02)
Start-up capital: >80k	-0.24 ^{***}	(0.03)
Urban	0.12 ^{***}	(0.01)
Industry dummies are included	Yes ^{***}	
Constant	-0.65 ^{***}	(0.05)
N entrepreneurs	61,362	
Log likelihood	-23,988.40	
Chi2	905.15 ^{***}	
Rho	-0.77	(p= 0.1131)

Notes: This table reports estimation results of the selection regression of the Heckman model; the estimates of the outcome regression are reported in Table 3-2. The dependent variable is coded as one if the individual chose hybrid entrepreneurship, zero if s/he is a full-time entrepreneur. The independent variables are chosen based on previous literature (Wennberg et al., 2006; Folta et al., 2010; Petrova, 2012; Raffiee and Feng, 2014). Categorical variables regarding small firm, medium firm, and large firm experience in the second stage of the Heckman selection model are dropped. Significance level: * p < 0.05, ** p < 0.01, *** p < 0.001; standard errors are in the parentheses.

Appendix: Proofs relegated to Chapter 6

A6.4 Benchmark case

As a benchmark, this proof solves for the contract that maximizes the firm owner's overall utility in absence of any agency problem. Let the emotional factor equal to zero, i.e. $\theta_i = 0$.

$$\max_{e_{i,1}, e_{i,2}} \pi_i = e_{i,1} + e_{i,2} - D_i \frac{e_{i,1}^2}{2} - d_i \frac{e_{i,2}^2}{2} - se_{i,1}e_{i,2} \quad (\text{A-1})$$

The first order conditions with respect to abilities are:

$$1 - D_i e_{i,1} - se_{i,2} = 0, \quad (\text{A-2})$$

$$1 - d_i e_{i,2} - se_{i,1} = 0, \quad (\text{A-3})$$

which lead to the optimal efforts in the benchmark case:

$$e_{i,1}^* = \frac{d_i - s}{D_i d_i - s^2}, \quad (\text{A-4})$$

$$e_{i,2}^* = \frac{D_i - s}{D_i d_i - s^2}. \quad (\text{A-5})$$

As this study focuses on case where both efforts are strictly positive, it assumes $D_i > s$ and $d_i > s$ throughout the paper.

Substitute equations (A-4) and (A-5) in the maximization problem (A-1), this study obtains the firm owner's benchmark optimal utility:

$$\pi_i^* = \frac{d_i + D_i - 2s}{2(D_i d_i - s^2)}. \quad (\text{A-6})$$

Lemma 1.

Differentiating equations (A-4) and (A-5) with respect to abilities D_i and d_i :

$$\frac{\partial e_{i,1}^*}{\partial D_i} = -\frac{d_i(d_i - s)}{(D_i d_i - s^2)^2} < 0, \quad (\text{A-7})$$

$$\frac{\partial e_{i,1}^*}{\partial d_i} = \frac{s(D_i - s)}{(D_i d_i - s^2)^2} \begin{cases} < 0 & \text{if } s < 0 \\ > 0 & \text{if } s > 0 \end{cases}, \quad (\text{A-8})$$

$$\frac{\partial e_{i,2}^*}{\partial D_i} = \frac{s(d_i - s)}{(D_i d_i - s^2)^2} \begin{cases} < 0 & \text{if } s < 0 \\ > 0 & \text{if } s > 0 \end{cases}, \quad (\text{A-9})$$

$$\frac{\partial e_{i,2}^*}{\partial d_i} = -\frac{D_i(D_i - s)}{(D_i d_i - s^2)^2} < 0, \quad (\text{A-10})$$

given that $D_i > s$ and $d_i > s$.

Lemma 2.

Here it only shows the proof for effort in task 1 the proof for task 2 can be achieved following the same steps. The derivative of $e_{i,1}^*$ with respect to s yields:

$$\frac{\partial e_{i,1}^*}{\partial s} = \frac{d_i(2s - D_i) - s^2}{(D_i d_i - s^2)^2}. \quad (\text{A-11})$$

If $s < 0$, it is straightforward to see $\frac{\partial e_{i,1}^*}{\partial s} < 0$. If $s > 0$, for the family manager:

$$\frac{\partial e_{F,1}^*}{\partial s} = \frac{d_F(2s - D_F) - s^2}{(D_F d_F - s^2)^2} < -\frac{(d_F - s)^2}{(D_F d_F - s^2)^2} < 0, \quad (\text{A-12})$$

where the first inequality comes from $d_F < D_F$ for the family manager. If $s > 0$, for the nonfamily manager, it remains to decide the sign of the numerator $[d_N(2s - D_N) - s^2]$. It is found that as s converges to 0 from the right, $[d_N(2s - D_N) - s^2]$ converges to $-d_N D_N$, which is strictly negative; as s converges to D_N from the left, $[d_N(2s - D_N) - s^2]$ converges to $D_N(d_N - D_N)$, which is always positive, given that $d_N - D_N > 0$ for the nonfamily manager. It remains to prove that $[d_N(2s - D_N) - s^2]$ is increasing in $s \in [0, D_N)$.

Note that the function $[d_N(2s - D_N) - s^2]$ is a parabola of s that is concave. The global maximizer and the maximum of this function is $[d_N, d_N(d_N - D_N)]$, that is, this function is increasing in $s \in (0, d_N)$. Observe that the upper bound of s , d_N , is smaller than the maximizer d_N .

Lemma 3.

Differentiating equation (A-6) on D_i and d_i . It is obvious to see that:

$$\frac{\partial \pi_i^*}{\partial D_i} = -\frac{(d_i - s)^2}{2(D_i d_i - s^2)^2} < 0, \quad (\text{A-13})$$

$$\frac{\partial \pi_i^*}{\partial d_i} = -\frac{(D_i - s)^2}{2(D_i d_i - s^2)^2} < 0. \quad (\text{A-14})$$

Differentiating equation (A-6) on s it concludes:

$$\frac{\partial \pi_i^*}{\partial s} = \frac{(d_i - s)(s - D_i)}{(D_i d_i - s^2)^2} < 0, \quad (\text{A-15})$$

which holds as $D_i > s$ and $d_i > s$.

Corollary 1.

Here only the proof for the family manager is provided, while for the nonfamily manager, the proof can be done following the same steps. From equations (A-4) and (A-5) it is observed that for the family manager, $e_{F,1}^* < e_{F,2}^*$, given that $d_F < D_F$. The difference between the family manager's efforts exerted in task 2 and task 1 is given by:

$$\Psi \equiv e_{F,2}^* - e_{F,1}^* = \frac{D_F - d_F}{D_F d_F - s^2}. \quad (\text{A-16})$$

Differentiating equation (A-16) twice with respect to s :

$$\frac{\partial^2 \Psi}{\partial s^2} = 2 \frac{(D_F - d_F)(D_F d_F + 3s^2)}{(D_F d_F - s^2)^3} > 0, \quad (\text{A-17})$$

which proves that Ψ is a strictly convex function. It is straightforward to see that Ψ reaches the minimum for $s = 0$.

Proposition 1.

The difference for the realized profits is:

$$\pi_F^* - \pi_N^* = \frac{d_F + D_F - 2s}{2(D_F d_F - s^2)} - \frac{d_N + D_N - 2s}{2(D_N d_N - s^2)}. \quad (\text{A-18})$$

Then, the claim follows immediately for symmetric abilities. In case of asymmetric abilities, w.l.o.g., suppose that $D_F + d_F < D_N + d_N$ and $d_F < D_N$. Therefore, the aim is to show that $\pi_F^* > \pi_N^*$ for every s . To simplify the algebra, let:

$$D_F = D_N + \sigma; \quad d_N = d_F + \epsilon, \quad (\text{A-19})$$

where σ and ϵ are positive. Observe that from $D_F + d_F < D_N + d_N$, the following holds:

$$D_N + \sigma + d_F < D_N + d_F + \epsilon \Rightarrow \sigma < \epsilon. \quad (\text{A-20})$$

With the above substitutions there is:

$$\begin{aligned} \pi_F^* - \pi_N^* &= \frac{d_F + D_F - 2s}{2(D_F d_F - s^2)} - \frac{d_N + D_N - 2s}{2(D_N d_N - s^2)} \\ &= \frac{\epsilon(D_N - s)^2 - \sigma(d_F - s)^2 + \sigma\epsilon(D_N - d_F)}{2[(s^2 - D_N(d_F + \epsilon))[(s^2 - d_F(D_N + \sigma))]} \\ &= \frac{\epsilon(D_N - s)^2 - \sigma(d_F - s)^2 + \sigma\epsilon(D_N - d_F)}{2[(s^2 - D_N d_N)[(s^2 - d_F D_F)]}. \end{aligned} \quad (\text{A-21})$$

The denominator of the above expression is positive given that $s^2 < D_i d_i$. Also, the numerator is positive because $d_F < D_N$ and $\sigma < \epsilon$.

Suppose instead that $D_i + d_i \geq D_j + d_j$ and $\min\{D_i, d_i\}$ are verified; w.l.o.g. the aim is to show that $\pi_F^* > \pi_N^*$. Then, from equation (A-18) it follows by assumption that the numerator of π_F^* is, at least, as large as the numerator of π_N^* ; with in addition d_F sufficiently small it yields $\pi_F^* > \pi_N^*$ for every s .

A6.5 The moral-hazard problem

Recall that for the family manager $\theta_F \in [0, \frac{1}{2}]$, whereas for the nonfamily manager $\theta_N = 0$. This proof first considers the case where $\theta_F \in [0, \frac{1}{2}]$. The aim is to solve the firm owner's utility maximization problem (I) when hiring a manager i .

The manager maximizes his utility (6-5) by choosing optimal efforts. The first order conditions are:

$$\gamma_i - D_i e_{i,1} - s e_{i,2} + \theta_i(1 - \gamma_i) = 0, \quad (\text{A-22})$$

$$\gamma_i \alpha - d_i e_{i,2} - s e_{i,1} + \theta_i(1 - \alpha \gamma_i) = 0. \quad (\text{A-23})$$

The manager's optimal effort levels are solved as:

$$e_{i,1} = \gamma_i(1 - \theta_i) \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \theta_i \frac{(d_i - s)}{D_i d_i - s^2}, \quad (\text{A-24})$$

$$e_{i,2} = \gamma_i(1 - \theta_i) \frac{(D_i \alpha - s)}{D_i d_i - s^2} + \theta_i \frac{(D_i - s)}{D_i d_i - s^2}. \quad (\text{A-25})$$

This study considers cases in which both managers exert positive efforts into the two tasks; therefore, to allow the nonfamily manager's effort in task 2 to be positive (in this case $\theta_N = 0$), this study assumes that $D_i \alpha - s > 0$.

The participation constraint (PC) is always slack at the optimum. Consequently, in designing optimal incentive contracts the principal sets $w_i^{**} = 0$, and the agent always gets a rent. Substituting equations (A-24) and (A-25) in the firm owner's objective function (I), the first order condition yields the optimal incentive rate presented in (6-7). Given the optimal piece-rate, this study obtains the manager's optimal effort levels in task 1 and task 2.

Substituting the optimal effort levels, the piece-rate, and fix pay into the managers' utility function (6-5) and the firm owner's utility function (6-3) respectively, this study obtains the managers' information rent presented in (6-8), and the firm owner's optimal utility presented in (6-10). It is obvious that the manager always attains a positive rent.

For simplicity, the following proofs for lemmas and propositions consider the case where $\theta_F = 0$. Hence, the optimal effort levels in task 1 and task 2 are presented as:

$$e_{i,1}^{**} = \gamma_i^{**} \frac{(d_i - \alpha s)}{D_i d_i - s^2}, \quad (\text{A-26})$$

$$e_{i,2}^{**} = \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2}. \quad (\text{A-27})$$

For $\theta_F = \frac{1}{2}$, the optimal incentive rate for the family manager is set to zero, i.e. $\gamma_F^{**} = 0$. Provided that both efforts are positive, the family manager's second-best effort levels are given by:

$$e_{F,1}^{**} = \theta_F \frac{(d_F - s)}{D_F d_F - s^2}, \quad (\text{A-28})$$

$$e_{F,2}^{**} = \theta_F \frac{(D_F \alpha - s)}{D_F d_F - s^2}. \quad (\text{A-29})$$

Using equations (A-28) and (A-29) this study obtains the family manager's information rent presented in (6-9).

Lemma 6.

The profit at the optimum for a family manager can be written as:

$$\pi_F^{**} = (e_{F,1}^{**} + e_{F,2}^{**}) - \gamma_F^{**} (e_{F,1}^{**} + \alpha e_{F,2}^{**}) - w_F \quad (\text{A-30})$$

Differentiating the previous expression w.r.t. θ_F :

$$\begin{aligned} \frac{\partial \pi_F^{**}}{\partial \theta_F} &= \frac{\partial (e_{F,1}^{**} + e_{F,2}^{**})}{\partial \theta_F} - \frac{\partial [\gamma_F^{**} (e_{F,1}^{**} + \alpha e_{F,2}^{**})]}{\partial \theta_F} \\ &= \frac{(1 - \alpha)^2}{[(d_F - \alpha s) + \alpha(D_F \alpha - s)]} + \frac{[(d_F - \alpha s) + (D_F \alpha - s)]^2}{4(D_F d_F - s^2)(1 - \theta_F^2)[(d_F - \alpha s) + \alpha(D_F \alpha - s)]} > 0 \end{aligned} \quad (\text{A-31})$$

Lemma 7.

i) This section analyzes how effort in task 1 changes in abilities D_i and d_i . The proof for effort in task 2 follows the same steps. For limited space it is omitted from the paper, and it is available upon request.

a) Let $\theta_i = 0$. Differentiating equation (A-26) with respect to D_i :

$$\frac{\partial e_{i,1}^{**}}{\partial D_i} = \frac{\partial \gamma_i^{**}}{\partial D_i} \frac{(d_i - \alpha s)}{D_i d_i - s^2} - \gamma_i^{**} \frac{d_i(d_i - \alpha s)}{(D_i d_i - s^2)^2}. \quad (\text{A-32})$$

To simplify the notation, let $\gamma_i^{**} = \frac{G}{H}$, with G and H the numerator and denominator as defined in equation (6-7). Therefore, $\frac{\partial \gamma_i^{**}}{\partial D_i} = \frac{\alpha H - 2\alpha^2 G}{H^2}$ and it can be written that:

$$\begin{aligned} \frac{\partial e_{i,1}^{**}}{\partial D_i} &= \frac{\alpha H - 2\alpha^2 G}{H^2} \frac{(d_i - \alpha s)}{D_i d_i - s^2} - \frac{G}{H} \frac{d_i (d_i - \alpha s)}{(D_i d_i - s^2)^2} \\ &= \frac{(d_i - \alpha s)}{H(D_i d_i - s^2)} \left(\alpha - \frac{2\alpha^2 G}{H} - \frac{G d_i}{D_i d_i - s^2} \right). \end{aligned} \quad (\text{A-33})$$

To show that $\frac{\partial e_{i,1}^{**}}{\partial D_i} < 0$, it is sufficient to show that $\alpha - \frac{G d_i}{D_i d_i - s^2} < 0$. Using the expression of G and rearranging:

$$\alpha - \frac{G d_i}{D_i d_i - s^2} = -\frac{(d_i - s)(d_i - \alpha s)}{D_i d_i - s^2} < 0. \quad (\text{A-34})$$

b) Let $\theta_i = 0$. Differentiating equation (A-26) with respect to d_i :

$$\frac{\partial e_{i,1}^{**}}{\partial d_i} = \frac{\partial \gamma_i^{**}}{\partial d_i} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \gamma_i^{**} \frac{s(D_i \alpha - s)}{(D_i d_i - s^2)^2}, \quad (\text{A-35})$$

which is negative if $s < 0$, given that $\frac{\partial \gamma_i^{**}}{\partial d_i} < 0$, $D_i \alpha - s > 0$ and $d_i - \alpha s > 0$.

c) If $s > 0$, the sign of $\frac{\partial e_{i,1}^{**}}{\partial d_i}$ is not straightforward to decide. Expanding and rearranging:

$$\frac{\partial e_{i,1}^{**}}{\partial d_i} = \frac{(D_i \alpha - s) \Phi(d_i)}{2 \{(D_i d_i - s^2) [(d_i - \alpha s) + \alpha (D_i \alpha - s)]\}^2} \quad (\text{A-36})$$

where Φ decides the sign and here it is considered as a function of d_i :

$$\Phi(d_i) = d_i^2 [s - D_i(1 - \alpha)] + 2d_i(D_i - 2s)s\alpha + s\alpha \{D_i \alpha [D_i \alpha - s(3 + \alpha)] + s^2(1 + 3\alpha)\} \quad (\text{A-46})$$

Therefore, $\Phi(d_i)$ is a parabola and the concavity/convexity depends on $s - D_i(1 - \alpha) \leq 0$. In any case, the maximizer (minimizer) d_i^m and maximum (minimum) $\Phi(d_i^m)$ are:

$$d_i^m = s\alpha \frac{(D_i - 2s)}{D_i(1 - \alpha) - s} \quad (\text{A-37})$$

$$\Phi(d_i^m) = \frac{(D_i - s)s\alpha(1 - \alpha)(D_i \alpha - s)^2}{D_i(1 - \alpha) - s} \quad (\text{A-38})$$

Suppose $s - D_i(1 - \alpha) > 0$. Then, $\Phi(d_i)$ is a convex parabola with a negative minimum. Moreover, for positive $e_{i,1}^{**}$ there is: $d_i > s > s\alpha > d_i^m$. Then, it is sufficient to show that for this lower bound

for d_i , the parabola $\Phi(d_i)$ is already positive: $\Phi(d_i = s\alpha) = s\alpha(D_i \alpha - s)^2 > 0$.

Suppose $s - D_i(1 - \alpha) < 0$. Then, $\Phi(d_i)$ is a concave parabola with a positive maximum. Therefore, $\Phi(d_i)$ is positive or negative.

Lemma 8.

i) Let $\theta_i = 0$. Here it provides a proof only for $e_{i,1}^{**}$ since the proof for $e_{i,2}^{**}$ follows the same steps.

Differentiating equation (A-26) with respect to s :

$$\frac{\partial e_{i,1}^{**}}{\partial s} = \frac{\partial \gamma_i^{**}}{\partial s} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \gamma_i^{**} \frac{-d_i(\alpha D_i - s) + s(d_i - \alpha s)}{(D_i d_i - s^2)^2}. \quad (\text{A-39})$$

a) If $s < 0$, first consider the case when $d_i - \alpha^2 D_i > 0$. The derivative of equation (6-7) with respect to s is given by:

$$\frac{\partial \gamma_i^{**}}{\partial s} = \frac{(\alpha - 1)(d_i - \alpha^2 D_i)}{2(d_i + \alpha(\alpha D_i - 2s))^2}. \quad (\text{A-40})$$

If $d_i - \alpha^2 D_i > 0$, $\frac{\partial \gamma_i^{**}}{\partial s} < 0$. Then, it is straightforward to see that $\frac{\partial e_{i,1}^{**}}{\partial s} < 0$. Then, the aim is to prove that $\frac{\partial e_{i,1}^{**}}{\partial s} < 0$ also holds for $d_i - \alpha^2 D_i < 0$. Rearranging equation (A-39):

$$\frac{\partial e_{i,1}^{**}}{\partial s} = \frac{1}{H(D_i d_i - s^2)} \left[-(d_i - \alpha s) + 4\alpha \frac{G}{H} (d_i - \alpha s) - \alpha (d_i - \alpha s) - G \frac{d_i(\alpha D_i - s)}{D_i d_i - s^2} + G \frac{s(d_i - \alpha s)}{D_i d_i - s^2} \right] \quad (\text{A-41})$$

It remains to prove that the equation in the above bracket is negative. To show that, it only needs

to prove that $\left[4\alpha \frac{G}{H} (d_i - \alpha s) - G \frac{d_i(\alpha D_i - s)}{D_i d_i - s^2} \right]$ is negative:

$$\begin{aligned} & 4\alpha \frac{G}{H} (d_i - \alpha s) - G \frac{d_i(\alpha D_i - s)}{D_i d_i - s^2} \\ &= \frac{G}{H} \left[4\alpha (d_i - \alpha s) - H \frac{d_i(\alpha D_i - s)}{D_i d_i - s^2} \right] \\ &= \frac{G}{H} \frac{2[d_i D_i \alpha (d_i - \alpha^2 D_i) + d_i^2 s + d_i D_i s \alpha^2 - 4\alpha d_i s^2 + 2\alpha^2 s^3]}{D_i d_i - s^2} < 0, \end{aligned} \quad (\text{A-42})$$

given that $d_i - \alpha^2 D_i < 0$ and $s < 0$.

b) If $s > 0$, first consider the case when $d_i - \alpha^2 D_i > 0$. In this case, firstly two intermediate results

are shown: if $\alpha \leq \frac{1}{2} \implies \frac{\partial e_{i,1}^{**}}{\partial s} < 0$ and if $\alpha > \frac{1}{2} \implies \frac{\partial^2 e_{i,1}^{**}}{\partial s^2} > 0$.

$\alpha \leq \frac{1}{2} \implies \frac{\partial e_{i,1}^{**}}{\partial s} < 0$. Rearranging $\frac{\partial e_{i,1}^{**}}{\partial s}$, it can be written as:

$$\begin{aligned} \frac{\partial e_{i,1}^{**}}{\partial s} &= -\frac{1}{H} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \frac{4\alpha}{H} \gamma_i^{**} \frac{(d_i - \alpha s)}{D_i d_i - s^2} - \frac{d}{D_i d_i - s^2} \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2} \\ &\quad - \frac{\alpha}{H} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \frac{s}{D_i d_i - s^2} \gamma_i^{**} \frac{(d_i - \alpha s)}{D_i d_i - s^2}. \end{aligned} \quad (\text{A-43})$$

This section proves separately that the first and the second line of the previous expression are negative. For the first line:

$$\begin{aligned} & -\frac{1}{H} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \frac{4\alpha}{H} \gamma_i^{**} \frac{(d_i - \alpha s)}{D_i d_i - s^2} - \frac{d}{D_i d_i - s^2} \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2} \\ = & -\frac{1}{D_i d_i - s^2} \left[\frac{(d_i - \alpha s)}{H} - \frac{4\alpha}{H} \gamma_i^{**} (d_i - \alpha s) + d \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2} \right] \end{aligned} \quad (\text{A-44})$$

Then, it needs to show that the term in the square bracket is positive or, and it is the same, that the following term is positive:

$$(d_i - \alpha s) - 4\alpha \gamma_i^{**} (d_i - \alpha s) + 2d \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2} (d_i - \alpha s) + 2d \gamma_i^{**} \frac{(D_i \alpha - s)}{D_i d_i - s^2} \alpha (D_i \alpha - s) \quad (\text{A-45})$$

Considering only the first three terms of the previous expressions, and simplifying:

$$\frac{2(d_i - \alpha s)^2}{H(D_i d_i - s^2)} [d_i (D_i - s) - \alpha (D_i d_i + D_i s - 2s^2)] > 0 \quad (\text{A-46})$$

To see that the square bracket of the previous equation is always positive, observe that $D_i \alpha - s > 0$ and $\alpha \leq \frac{1}{2}$ imply (at least) $D_i > 2s$. Then, suppose that $\alpha = \frac{1}{2}$ making the expression as smaller as possible. In this case, the term in the square bracket is $\frac{1}{2} (D_i - 2s) (d_i - s) > 0$.

For the second line:

$$\begin{aligned} & -\frac{\alpha}{H} \frac{(d_i - \alpha s)}{D_i d_i - s^2} + \frac{s}{D_i d_i - s^2} \gamma_i^{**} \frac{(d_i - \alpha s)}{D_i d_i - s^2} \\ = & -\frac{(d_i - \alpha s)}{(D_i d_i - s^2)^2 H} [\alpha (D_i d_i - s^2) - sG] \\ = & -\frac{(d_i - \alpha s)}{(D_i d_i - s^2)^2 H} [(d_i - s) (D_i \alpha - s)] < 0 \end{aligned} \quad (\text{A-47})$$

$\alpha > \frac{1}{2} \implies \frac{\partial^2 e_{i,1}^{**}}{\partial s^2} > 0$. Since the algebra is intractable for the second derivative of $e_{i,1}^{**}$, the answer is attained using Mathematica.³⁷

³⁷ Mathematica code: Reduce[Simplify[D[D[effort1moha[d, D1, s, alpha], s], s]] > 0 && s^2 < D1d && D1 > s && d > s && D1 > 0 && d > 0 && D1alpha > s && 0 < alpha < 1 && s > 0 && d > D1alpha^2 && alpha > 1/2]. Note that here $D1$ is used instead of D as “ D ” usually indicates “differentiation” in Mathematica.

Then, strict convexity implies uniqueness and it remains to prove that there exists a threshold for s where $e_{i,1}^{**}$ is increasing. Remember that $d_i - \alpha^2 D_i > 0$ and therefore the maximum s is $s_{\max} = \min \{D_i \alpha, d_i\}$. Computing the limit of $\frac{\partial e_{i,1}^{**}}{\partial s}$ in the two possible upper bounds:

$$\lim_{s \rightarrow \alpha D_i^-} \frac{\partial e_{i,1}^{**}}{\partial s} = -\frac{1 - 2\alpha}{2D_i(d_i - D_i \alpha^2)} > 0, \quad (\text{A-48})$$

where the inequality follows from $\alpha > \frac{1}{2}$ and $d_i - D_i \alpha^2 > 0$.

$$\lim_{s \rightarrow d_i^-} \frac{\partial e_{i,1}^{**}}{\partial s} = \frac{-2D_i d_i \alpha^3 + D_i^2 \alpha^4 + d_i^2 (1 - 4\alpha + 6\alpha^2 - 2\alpha^3)}{2d_i (d_i - D_i) (d_i - 2d_i \alpha + D_i \alpha^2)^2}. \quad (\text{A-49})$$

The previous expression is always positive if $d_i > D_i$ and positive if $d_i < D_i$ but d_i large enough.

If $s > 0$, only for the family manager, there is $d_F - D_F \alpha^2 \leq 0$. In this case, to show that $\frac{\partial e_{F,1}^{**}}{\partial s} < 0$ also for any positive s , the proof proceeds as follows. Observe that:

$$\frac{\partial e_{F,1}^{**}}{\partial \alpha \partial s} = \frac{-(2 - \alpha) \alpha (D_F \alpha^2 - d_F) - 2\alpha^2 (d_F - s\alpha)}{[(d_F - s\alpha) + \alpha (D_F \alpha - s)]^3} < 0. \quad (\text{A-50})$$

Then, since the lower bound for α must satisfy $d_F - \alpha^2 D_F = 0$ where $\frac{\partial \gamma_{i,1}^{**}}{\partial s} = 0$, it obtains:

$$\begin{aligned} \lim_{\alpha \rightarrow \sqrt{\frac{d_F}{D_F}}} \frac{\partial e_{i,1}^{**}}{\partial s} &= \lim_{\alpha \rightarrow \sqrt{\frac{d_F}{D_F}}} \gamma_i^{**} \frac{\partial}{\partial s} \left(\frac{d_F - s\alpha}{D_F d_F - s^2} \right). \text{ Hence, the sign of the limit depends on } \frac{\partial}{\partial s} \left(\frac{d_F - s\alpha}{D_F d_F - s^2} \right): \\ \frac{\partial}{\partial s} \left(\frac{d_F - s\alpha}{D_F d_F - s^2} \right) &= \frac{2d_F s - D_F d_F \alpha - s^2 \alpha}{(D_F d_F - s^2)^2} = \frac{2d_F s - \frac{d_F^2}{\alpha} - s^2 \alpha}{(D_F d_F - s^2)^2} = \\ \frac{2d_F s \alpha - d_F^2 - s^2 \alpha^2}{\alpha (D_F d_F - s^2)^2} &= -\frac{(d_F - s\alpha)^2}{\alpha (D_F d_F - s^2)^2} < 0, \end{aligned} \quad (\text{A-51})$$

where the second equality uses $D_F = \frac{d_F}{\alpha^2}$.

Lemma 9.

i) Let $\theta_i = 0$. This proof checks the impact of α on $e_{i,1}^{**}$ for $d_i - \alpha^2 D_i > 0$ and $d_i - \alpha^2 D_i < 0$.

a) First consider the case when $d_i - \alpha^2 D_i > 0$. Differentiating equation (A-26) with respect to α :

$$\frac{\partial e_{i,1}^{**}}{\partial \alpha} = \frac{d_i(1 - 2\alpha) - (D_i - 2s)\alpha^2}{2[(d_i - \alpha s) + \alpha(D_i \alpha - s)]^2}. \quad (\text{A-52})$$

Since the sign of $\frac{\partial e_{i,1}^{**}}{\partial \alpha}$ depends on the expression of the numerator, this proof studies:

$$\Phi(\alpha) \equiv -(D_i - 2s)\alpha^2 - 2d_i\alpha + d_i. \quad (\text{A-53})$$

$\Phi(\alpha)$ is a quadratic function of α and the concavity/convexity depends on $D_i - 2s > 0$ or < 0 . The maximum/minimum is for:

$$\hat{\alpha} = -\frac{d_i}{D_i - 2s}, \quad \Phi(\hat{\alpha}) = \frac{d_i}{D_i - 2s}[(d_i - s) + (D_i - s)] \geq 0. \quad (\text{A-54})$$

Suppose $D_i - 2s > 0$, then $\Phi(\alpha)$ is a concave function of α with $\hat{\alpha} < 0$ and $\Phi(\hat{\alpha}) > 0$. Remember that α has two lower-bounds: either $\alpha > \frac{s}{D_i}$ (if $s > 0$) or $\alpha > 0$ (if $s < 0$). In both cases:

$$\lim_{\alpha \rightarrow 0^+} \Phi(\alpha) = d_i > 0, \quad (\text{A-55})$$

$$\lim_{\alpha \rightarrow (\frac{s}{D_i})^+} \Phi(\alpha) = \frac{(D_i d_i - s^2)(D_i - 2s)}{D_i^2} > 0. \quad (\text{A-56})$$

Then this proof studies the sign of $\Phi(\alpha)$ as α approaches its upper bound: $\alpha < 1$ (for the nonfamily manager) or $\alpha < \sqrt{\frac{d_F}{D_F}}$ (for the family manager). The following computes the limit of $\Phi(\alpha)$ as follows:

$$\lim_{\alpha \rightarrow 1^-} \Phi(\alpha) = (s - d_N) + (s - D_N) < 0, \quad (\text{A-57})$$

$$\lim_{\alpha \rightarrow (\sqrt{\frac{d_F}{D_F}})^-} \Phi(\alpha) = \frac{2d_F(s - \sqrt{d_F D_F})}{D_F} < 0. \quad (\text{A-58})$$

Therefore, by continuity arguments and by the fact that $\Phi(\alpha)$ is a parabola, it is concluded that if $D_i > 2s$, an increase of α leads to an increase of effort exerted in task 1 if α is relatively small, otherwise to a decrease of effort in task 1.

Suppose $D_i - 2s < 0$, then $\Phi(\alpha)$ is a convex function of α with $\hat{\alpha} > 0$ and $\Phi(\hat{\alpha}) < 0$. In this case, s cannot be negative. Hence, the lower bound of α is $\frac{s}{D_i}$. The limit of $\Phi(\alpha)$ around $(\frac{s}{D_i})^+$ is calculated as:

$$\lim_{\alpha \rightarrow (\frac{s}{D_i})^+} \Phi(\alpha) = \frac{(D_i d_i - s^2)(D_i - 2s)}{D_i^2} < 0. \quad (\text{A-59})$$

Recall that it is found in equations (A-57) and (A-58) that as α converges to its upper bounds, $\Phi(\alpha)$ always converges to a negative value. Moreover, observe that $\hat{\alpha} > 1$. Given that $\alpha < 1$, and $\Phi(\alpha)$ is a parabola, it is concluded that if $D_i < 2s$, an increase of α always leads to a decrease of effort level in task 1.

b) If $d_i - D_i\alpha^2 < 0$, the following holds:

$$\frac{\partial e_{i,1}^{**}}{\partial \alpha} = \frac{d_i(1-2\alpha) - (D_i - 2s)\alpha^2}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)]^2} < \frac{-2\alpha(d_i - \alpha s)}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)]^2} < 0. \quad (\text{A-60})$$

The first inequality in the above equation comes from $d_i - D_i\alpha^2 < 0$.

ii) Let $\theta_i = 0$. Differentiating equation (A-27) with respect to α :

$$\frac{\partial e_{i,2}^{**}}{\partial \alpha} = \frac{(d_i - s) + D_i\alpha(1 - \alpha) + (D_i\alpha - s)}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)]^2} > 0, \quad (\text{A-61})$$

given that $d_i - s > 0$, $1 - \alpha > 0$ and $D_i\alpha - s > 0$.

Corollary 2.

Using equations (A-26) and (A-27) the difference between the manager's efforts exerted in task 1 and task 2 is calculated as:

$$e_{i,1}^{**} - e_{i,2}^{**} = \frac{[(d_i - \alpha s) + (D_i\alpha - s)][(d_i - \alpha s) - (D_i\alpha - s)]}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)](D_i d_i - s^2)}. \quad (\text{A-62})$$

Given that $d_i - \alpha s > 0$, $D_i\alpha - s > 0$ and $D_i d_i - s^2 > 0$, the sign of equation (A-62) depends on the expression $[(d_i - \alpha s) - (D_i\alpha - s)]$.

i) For the nonfamily manager, $(d_N - \alpha s) - (D_N\alpha - s) > (d_N + s)(1 - \alpha) > 0$. Hence, $e_{N,1}^{**} - e_{N,2}^{**} > 0$.

Moreover, differentiating equation (A-62) with respect to α using Mathematica 11³⁸:

$$\frac{\partial(e_{N,1}^{**} - e_{N,2}^{**})}{\partial \alpha} = \frac{-(D_N\alpha - s) - \alpha(d_N - \alpha s)}{[(d_N - \alpha s) + \alpha(D_N\alpha - s)]^2} < 0, \quad (\text{A-63})$$

given that $d_i - \alpha s > 0$ and $D_i\alpha - s > 0$.

ii) For the family manager, first solve the inequality $e_{F,1}^{**} - e_{F,2}^{**} > 0$ for α . The solution is $d_F + s > 0$ and $\alpha < \frac{d_F + s}{D_F + s}$. The proof regarding how α impacts equation (A-62) is the same as for the nonfamily manager.

Second, solve the inequality $e_{F,1}^{**} - e_{F,2}^{**} < 0$ for α , and the solution is $d_F + s < 0$ or $d_F + s > 0$ and $\alpha > \frac{d_F + s}{D_F + s}$. The effort difference is given by:

$$e_{F,2}^{**} - e_{F,1}^{**} = -\frac{[(d_F - \alpha s) + (D_F\alpha - s)][(d_F - \alpha s) - (D_F\alpha - s)]}{2[(d_F - \alpha s) + \alpha(D_F\alpha - s)](D_F d_F - s^2)}. \quad (\text{A-64})$$

³⁸ Mathematica code: D[$e_{i,1}^{**} - e_{i,2}^{**}$, α].

Differentiating equation (A-64) with respect to α using Mathematica 11³⁹:

$$\frac{\partial(e_{F,2}^{**} - e_{F,1}^{**})}{\partial\alpha} = \frac{(D_F\alpha - s) + \alpha(d_F - \alpha s)}{[(d_F - \alpha s) + \alpha(D_F\alpha - s)]^2} > 0, \quad (\text{A-65})$$

given that $d_F - \alpha s > 0$ and $D_F\alpha - s > 0$.

A6.6 The optimal hiring decision

Lemma 10.

Differentiating equation (6-10) with respect to α :

$$\frac{\partial\pi_i^{**}}{\partial\alpha} = \frac{(1 - \alpha)[(d_i - s) + \alpha(D_i - s)]}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)]^2} > 0, \quad (\text{A-66})$$

given that $d_i > s$, $D_i > s$, and $0 < \alpha < 1$.

To study the effect of an increase in s on the profit, this proof checks the impact for $d_i - \alpha^2 D_i > 0$ and $d_i - \alpha^2 D_i < 0$ and it shows that in both cases $\frac{\partial\pi_i^{**}}{\partial s} < 0$. For $d_i - \alpha^2 D_i > 0$, there is: $\pi_i^{**} = \frac{1}{2}(e_{i,1}^{**} + e_{i,2}^{**})$. Hence, the derivative of equation (6-10) with respect to s can be written as:

$$\frac{\partial\pi_i^{**}}{\partial s} = \frac{1}{2}\left(\frac{\partial e_{i,1}^{**}}{\partial s} + \frac{\partial e_{i,2}^{**}}{\partial s}\right). \quad (\text{A-67})$$

Using Mathematica 11 to compute the following:

$$\frac{\partial e_{i,1}^{**}}{\partial s} + \alpha \frac{\partial e_{i,2}^{**}}{\partial s} = \frac{-(D_i\alpha - s)(d_i - s) - (d_i - \alpha s)(D_i - s)}{2(D_i d_i - s^2)^2} < 0, \quad (\text{A-68})$$

given that $d_i > s$, $D_i > s$, and $D_i\alpha > s$. Remember that from Lemma 8 there is $\frac{\partial e_{i,2}^{**}}{\partial s} < 0$, hence,

$$\frac{\partial e_{i,1}^{**}}{\partial s} + \frac{\partial e_{i,2}^{**}}{\partial s} < \frac{\partial e_{i,1}^{**}}{\partial s} + \alpha \frac{\partial e_{i,2}^{**}}{\partial s}. \text{ Therefore, } \frac{\partial\pi_i^{**}}{\partial s} < 0.$$

For $d_i - \alpha^2 D_i < 0$ the following holds:

$$\frac{\partial\pi_i^{**}}{\partial s \partial \alpha} = \frac{(1 - \alpha) \{ (D_i\alpha^2 - d_i) (1 - \alpha) + 2\alpha [(d_i - \alpha s) + (D_i\alpha - s)] \}}{2[(d_i - \alpha s) + \alpha(D_i\alpha - s)]^3} > 0. \quad (\text{A-69})$$

Then, it is sufficient to show that $\frac{\partial\pi_i^{**}}{\partial s} < 0$ for $\alpha = 1$: $\lim_{\alpha \rightarrow 1^-} \frac{\partial\pi_i^{**}}{\partial s} = -\frac{(d_i - s)(D_i - s)}{2(D_i d_i - s^2)^2} < 0$.

³⁹ Mathematica code: D[e_{i,2}^{**} - e_{i,1}^{**}, α].

Proposition 2.

In this case, $D_N = d_F$, $D_F = d_N$, and $\theta_F = 0$. The firm owner's utility difference when hiring a family or a nonfamily manager is given by:

$$\begin{aligned}
\pi_F^{**} - \pi_N^{**} &= \frac{[(d_F - s) + \alpha(D_F - s)]^2}{4(D_F d_F - s^2)[(d_F - s\alpha) + \alpha(D_F \alpha - s)]} - \frac{[(d_N - s) + \alpha(D_N - s)]^2}{4(D_N d_N - s^2)[(d_N - s\alpha) + \alpha(D_N \alpha - s)]} \\
&= \frac{[(d_F - s) + \alpha(D_F - s)]^2}{4(D_F d_F - s^2)[(d_F - s\alpha) + \alpha(D_F \alpha - s)]} - \frac{[(D_F - s) + \alpha(d_F - s)]^2}{4(d_F D_F - s^2)[(D_F - s\alpha) + \alpha(d_F \alpha - s)]} \\
&= \frac{(\alpha - 1)^3(\alpha + 1)(d_F - D_F)}{-4(d_F \alpha^2 + D_F - 2\alpha s)[\alpha(D_F \alpha - s) + (d_F - \alpha s)]}.
\end{aligned} \tag{A-70}$$

The numerator is positive given that $0 < \alpha < 1$ and $d_F < D_F$. Regarding the denominator, it is obvious that $[\alpha(D_F \alpha - s) + (d_F - \alpha s)] > 0$. Moreover, $d_F \alpha^2 + D_F - 2\alpha s > 0$ if $s < 0$. If $s > 0$, $d_F \alpha^2 + D_F - 2\alpha s > s\alpha^2 + s - 2\alpha s = s(\alpha - 1)^2 > 0$. Therefore, it always holds that $\pi_F^{**} - \pi_N^{**} < 0$.