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Virgilio Failla

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Three Essays on the Dynamics of Entrepreneurs in the Labor Market

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Ph.D. School in Economics and Management

Copenhagen Business School

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ENGLISH SUMMARY

New firms are a driving force of innovation and creative destruction, promoting social mobility and welfare creation. These result from the effort of entrepreneurial individuals who identify an opportunity, evaluate it, and create new organizations to exploit its business potential. Entrepreneurship is connected to existing organizations because the phenomenon of new firm foundation can be viewed in the vast majority of cases as a career choice of workers who found new firms following a period in wage employment. Extant literature in labor economics however prevalently focuses on individuals viewed as employees, thus overlooking the dynamic and transitory nature of entrepreneurship. This thesis consists of three essays on entrepreneurship that integrate the labor market literature with the entrepreneurship research. The first essay considers the entrepreneurial implications the founders' pre-entry experiences in the labor market, by studying the impact of a varied career pattern in connection to the performance of new ventures. The second essay regards one important dimension of labor markets, i.e. the turnover of workers, in connection to entrepreneurship. The essay provides a dynamic analysis of an experience in entrepreneurship and its impact on workers' turnover. The third essay explores how the existing organizations impact on the choices to become an entrepreneur. In particular, it is shown that a firm attribute such as tournament might produce a different effect on entrepreneurial individuals working in small firms as opposed to those employed in larger firms.

All the essays draw on the IDA database, the integrated database for labor market research that is maintained by Statistics Denmark. The rich set of information available in IDA makes it possible to track individuals, their employers and the founders of new firms, thus enabling the study of entrepreneurs in connection to their experience in the labor market.

DANSK SAMMENDRAG

Nye virksomheder er drivkraften bag innovation og kreativ destruktion ved at promovere social mobilitet og skabelse af velfærd. Disse skyldes iværksætteres bestræbelse på at identificere en mulighed, evaluere den og skabe en ny organisation for at udnytte dens forretningspotentiale. Iværksætteri forbundet med allerede eksisterende organisationer idet er virksomhedsskabelsesfænomenet i de fleste tilfælde kan ses som en medarbejders karrierevalg, som grundlægger af en ny virksomhed, efter en periode i lønnet beskæftigelse. Eksisterende litteratur inden for arbejdsmarkedsøkonomi fokuserer imidlertid overvejende på individer som medarbejdere og overser dermed dynamikken og den transitoriske karakter af iværksætteri. Denne afhandling består af tre artikler om iværksætteri ved at integrere litteratur om arbejdsmarkedsøkonomi med forskning om iværksætteri. Den første artikel handler om de iværksættermæssige konsekvenser af grundlæggerens tidligere erfaring på arbejdsmarkedet ved at fokusere på indvirkningen af et varieret karrieremønster på succesen af den nye virksomhed. Den anden artikel omhandler én vigtig dimension af arbejdsmarkedet i forbindelse med iværksætteri, nemlig personaleomsætning. Artiklen præsenterer en dynamisk analyse af erfaring inden for iværksætteri og dettes indflydelse på personaleomsætning. Den tredje artikel udforsker hvordan den eksisterende organisation påvirker valget om at blive iværksætter. I særdeleshed påvises det, at en virksomhedsegenskab så som 'tournament' kan have en anden effekt på entreprenante individer der arbejder i små virksomheder end dem der er ansat i store virksomheder. Alle artiklerne benytter IDA databasen, den integrerede database for arbejdsmarkedsforskning, som varetages af Danmarks Statistik. Den omfattende mængde af information tilgængelig i IDA gør det muligt at følge individer, deres arbejdsgivere og grundlæggerne af nye virksomheder, hvilket muliggjorde studiet af iværksættere i tilknytning til deres erfaring på arbejdsmarkedet.

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1 Introduction

1.1 Overall aim and motivation

This thesis investigates relationships between the phenomenon of job hopping and new firms foundation by combining the literature on labor economics and the research in entrepreneurship.

Entrepreneurship is thus viewed by taking a labor market perspective in order to incorporate the tenets of labor economics.

Building on these two literatures has the advantage of providing an interesting point of view on entrepreneurship for different reasons: first, since entrepreneurship can be viewed as a career choice and the mechanisms governing career decisions in wage employment can be transferred to career decisions regarding self-employment (Sorensen and Sharkey, 2014), and second, because the dynamics of individuals in the labor market are closely interconnected to transitions to entrepreneurship. The vast majority of individuals (almost the totality of entrepreneurs) start their own firms after leaving their jobs as employees (Bruce and Schuetze, 2004, Carroll and Mosakowski, 1987, Evans and Leighton, 1989).

Third, the experience in the workplace has been shown to impact the transition to entrepreneurship: among others, Elfenbein et al. (2010) documented a "small firm effect" and Ozcan and Reichstein (2009) show how the public sector is associated with lower hazards of transition to entrepreneurship, while Nanda and Sørensen (2010) study how co-workers influence the departure to entrepreneurship.

Lastly, since entrepreneurship is of a transitory nature, entrepreneurs who leave selfemployment will find themselves in the labor market in order to look for a job in an existing firm (Bruderl et al., 1992, Kaiser and Malchow-Moller, 2011).

1.2 Theoretical framework

Throughout the thesis, the notion of job-hopping is presented as one of the main variables of the study. It defines and captures the situation in which a focal individual in wage employment moves to another employer. Job hopping has a central place in the thesis because it has a number of implications for individuals in the job market. First, workers' turnover can be viewed as an event aimed at obtaining a better match with the new employer, which has been highlighted as one of the positive and desirable outcomes of job-hopping (Jackson, 2013, Jovanovic, 1979). Moreover, individuals who change employers are exposed to the environment of different firms, and thus accumulate experience in a multitude of contexts that may affect in different ways their choice to enter self-employment (Sorensen and Sharkey, 2014). Furthermore, the characteristics of individuals with higher rates of job hopping seem to be systematically different from workers who accumulate longer tenure at the same employer, as shown by Munaisnghe and Sigman, (2004), who find a detrimental effect on wages for the so-called "hobos", i.e. the individuals who change employer more frequently.

It is worth noting – as anticipated earlier – that job-hopping is not necessarily limited to movements of employees to different employers. The particular transition from wage employment to entrepreneurship is central to the entrepreneurship research and is one of the main variables and objects of study in the thesis. More specifically, a transition to entrepreneurship is here defined as the situation in which individuals in wage employment found a new firm. By adopting such a

definition, two main advantages are achieved. The first is to avoid ambiguity since the event of firm foundation is univocal and can be easily identified from the data records. Second, identifying and studying entrepreneurship as represented by the event of new firm foundation would provide a direct connection to the extant literature, thereby facilitating the comparison of the results of the present study with the other findings in the field.

If on the one hand, labor market dynamics contribute to explaining the transition to entrepreneurship, on the other hand, the experience in entrepreneurship – which is of a transitory nature – has a substantial impact on the labor market. Understanding the kind of implications job hopping has on entrepreneurship is crucial, because entrepreneurship is indeed a mobility process. Studying this relationship (i.e. between job hopping and employees' mobility to entrepreneurship) is particularly important for a number of reasons.

In fact, employee turnover is an increasingly common phenomenon (Farber, 1999) characterizing labor markets. It has been shown that job hopping in the context of wage employment has a number of implications for workers, such as being associated, *ceteris paribus*, with a lower wage (Munasinghe and Sigman, 2004). Understanding the implications of the preentry job hopping patterns in wage employment contributes to shedding light on the triggers of entrepreneurship and on the implications for the quality and performances of the new firms. Moreover, the patterns of job turnover in wage employment are directly connected to entrepreneurship: individuals who exhibit relatively higher employment turnover rates are the ones more likely to transition to entrepreneurship (Astebro and Thompson, 2011, Hyytinen and Ilmakunnas, 2007, Silva, 2007, Wagner, 2006). Lastly, the characteristics of labor market pre-entry experiences and the mechanisms that trigger entrepreneurship on behalf of high turnover individuals have relevance for policy makers and the private sector - for instance, by enabling interventions specifically targeted to the more entrepreneurial employees in order to retain them.

1.3 Structure of the dissertation

The thesis consists of three main research objectives: 1) to uncover the performance implications of job hopping for entrepreneurs, 2) to study and disentangle the implications of an entrepreneurial experience in the labor market and 3) to examine contextual effects, and specifically the turnover that explain what triggers the decision to become an entrepreneur.

All the three following chapters rely on Danish register data maintained by Statistics Denmark and referred to as IDA (from the Danish acronym for *Integrerede Database for Arbejdsmarkedsforskning*, the Integrated Database for Labor Market Research). IDA is a matched employer-employee database containing fine-grained information about individuals and firms that makes it possible to track down the job-hopping pattern of individuals and is therefore central to the analysis of individuals' job hopping and entrepreneurial outcomes. All the empirical analyses in the chapters are based on this data and benefit equally from the detail and richness of the IDA database. The commonalities of the various chapters are therefore not limited to the theoretical backbone represented by the combination of the entrepreneurship and labor economics literature, as illustrated in the previous section.

The three chapters are summarized below.

Chapter 2

The entrepreneurship literature suggests that individuals investing in a balanced set of skills become entrepreneurs, while those specializing in a particular skill will be more likely to choose wage employment. However, little is known about the entrepreneurial outcomes of individuals with highly varied work experiences as opposed to those with a less varied career. The aim of this chapter is to understand how the characteristics of the entrepreneurs' pre-entry job-hopping experience affect the performance of the new venture, and in particular, to identify what is the right experience that enhances the performance of the new ventures.

Experience in the labor market is associated with learning (Rosen, 1972), and individuals might move across firms in order to accumulate pre-entry experiences and invest in human capital (i.e. accumulate a varied set of the "right" experiences). To what extent is the learning process that takes place in the labor market in the form of job hopping the key to a new venture's success? To address this question, a unique longitudinal sample of first time Danish self-employed individuals in 2003 is used. Built from IDA this dataset contains information about individuals, firms, as well as the individual-firm link. Results from discrete time duration models show that individuals who accumulate a varied job history in terms of industries will be penalized, as will frequent job hoppers. Conversely, firms founded by individuals who held managerial positions survive longer. Successful jacks-of-all trades seem to be entrepreneurs who do not wander across industries or firms but who accumulate a variety of experiences by occupying specific roles in the parent organization. The contribution of this paper is directed at extending the implication of the Lazear's jack-of-all trades theory in entrepreneurship (Lazear, 2005). By showing that frequent job hoppers are more likely to found a new firm, the existing literature has established a link between pre-entry experience in the job market, the acquisition of a varied skill set and the transition to

entrepreneurship. However, the question of whether high job hopping is associated with better or worse entrepreneurial outcomes has not been answered. The second chapter of the dissertation contributes to the debate by showing that although frequent job hoppers may be more likely than others to start a new firm, they are not necessarily more likely to succeed as entrepreneurs.

Chapter 3

This chapter addresses the following research question: Does entrepreneurship lower individuals' employment turnover rates? Two reasons are put forward for why this is the case – a matching mechanism and a lock-in effect. Moreover, theoretical justifications are included in the analysis, which aims at empirically disentangling and teasing out the two mechanisms. A matched employer-employee data covering the entire Danish labor force (obtained from the IDA database) warrants the identification of a matched sample of entrepreneurs and non-entrepreneurs useful for rigorous analysis. The analysis supports the idea that self-employed retain their employment status longer compared to individuals in wage employment. This result is shown to be likely due to reduced attractiveness in the wage sector and sunk costs related to lock-in effects. Results, however, also indicate that entrepreneurship may resolve mismatches of individuals in the labor market. This counterintuitive finding – self-employment yields greater employment stability – has implications for the understanding of the returns (labor market outcomes) to entrepreneurship.

This chapter contributes to bridging the labor economics literature and the entrepreneurship literature by examining entrepreneurship as a form of career choice and by focusing on the entrepreneurs *after* the transition from the wage sector. Moreover, by showing that frequent job hoppers are more likely to enjoy a better match with the characteristics of self-employment, it contributes to the debate on the entrepreneurship earning puzzle by identifying a new element in the set of non-pecuniary rewards: job stability.

Chapter 4

Chapter 4 investigates how the likelihood of entrepreneurial activity is related to the tournament taking place within a firm as a function of firm size. Arguably, tournament – which is one of the most common tools employers use to create incentives and thus lower the monitoring costs - has different impacts on employees of small firms compared to those of larger firms because individuals select into small firms on the basis of a preference for autonomy and their skills. We argue that an increase in the tournament taking place in a firm relative to competitors has a negative effect on transitions to entrepreneurship in small firms, while it increases the likelihood of spawning entrepreneurs in larger firms. This association is tested on a comprehensive matched employeremployee longitudinal data set from Denmark (IDA), by focusing on newly hired employees in order to mitigate potential confounding mechanisms such as firm-employee matching. We find that individuals are less likely to become entrepreneurs if they start working for small firms exhibiting higher levels of tournament as measured by the Gini coefficient relative to direct competitors. This suggests that combining sources of incentives to entrepreneurship has a different effect based on the firm size. The chapter contributes to the entrepreneurship literature by showing that tournament triggers the transition to self-employment, and ultimately suggests that the sources of incentives to entrepreneurship have a different effect depending on firm size.

1.4 Implications

The three chapters have implications for the various actors involved in the entrepreneurial process. The second chapter proposes that the accumulation experience in the labor market as a function of job-hopping can be beneficial for the new venture survival. Potentially, policy makers could set up programs aimed at supporting entrepreneurship by targeting in specific ways

individuals with particular pre-entry managerial experience or those who do have not accumulated experiences in too many different industries. Also, investors could increase their success by adding a further dimension to the critical characteristics considered when evaluating nascent entrepreneurs.

The third chapter has implications for potential entrepreneurs who are considering changing their current work setting in order to look for a context providing an increased match to their preferences. Moreover, the fact that job matching is one of the major determinants of the stability of entrepreneurs compared to high turnover individuals is a key element that can be considered for designing programs aimed at targeting those individuals within the organization who possess an entrepreneurial mindset.

The fourth chapter has implications for employers since it sheds light on the effects that tournament relative to competitors has on the departure of the more entrepreneurial individuals. The structure of internal incentives has a noticeable secondary effect with its impact on individuals' choices to become entrepreneurs: these vary accordingly to the preferences of workers. Managers of existing firms can have an impact on the unintended departure of entrepreneurial workers by carefully designing their incentive structure.

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2 Pre-entry Career Experience and Start-up Survival

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Abstract

The entrepreneurship literature suggests that individuals who invest in a balanced set of skills become entrepreneurs, while those who specialize in a particular skill are more likely to choose wage employment. Do entrepreneurial outcomes of individuals with highly varied work experiences differ from those with a less varied career? More specifically, how are the characteristics of the entrepreneurs' working career reflected in the performance of the new venture? This study uncovers the features of pre-entry experience associated with the performance of new ventures. Entrepreneurs moving across various firms, industries, and positions in the same firm accumulate pre-entry experiences that impact on their human capital in a different way than those who instead are stable at the same employer. Is an individual's exposure to a variety of work experiences associated with success in a new venture? To address these questions a unique longitudinal sample of first time Danish self-employed individuals in 2003 is used. Built from the Integrated Database for Labor Market Research this dataset contains information about individuals, firms, and the individual-firm link, making it possible to construct precise measures about career patterns. Results from the discrete time duration model show that individuals who accumulate a varied job history in terms of industries will be penalized, as will those who work for a higher number of employers prior to becoming entrepreneurs. Conversely, firms founded by individuals who have held managerial positions survive longer. Successful jacks-of-all trades seem to be entrepreneurs who do not wander across industries or firms but who accumulate a variety of experiences by occupying specific roles in established organizations.

2.1 Introduction

Entrepreneurs are individuals who possess the skills needed to recognize, evaluate, and exploit opportunities (Shane Venkataraman, 2000). They can be viewed as generalist workers who have developed a broad set of abilities and differ from wage employees who on the contrary are specialized in one field (Lazear, 2005). Jack-of-all-trades – the individuals with a varied skill-set – are more likely to enter entrepreneurship compared to specialized workers (Lazear, 2005, Åstebro et al. 2011).

Moreover, recent evidence shows that entrepreneurs' more varied labor market experience is likely to be the result of a preference for job-related variety (Åstebro and Thompson, 2011). The link between career patterns and the transition to entrepreneurship has been well documented: Wagner (2006) uses German data to show that the number of fields of professional experience and the number of professional degrees have an impact on the probability of being a nascent entrepreneur. Silva (2007) documents how the jack-of-all-trades proxy increases (albeit modestly) the probability of being an entrepreneur but the effect disappears when individual fixed effects are accounted for, suggesting that the results could be interpreted as a result of the innate ability of individuals.

This evidence of the link between varied pre-entry experience and the transition to entrepreneurship is complemented with some studies about the variety of skills possessed by entrepreneurs and its effect on entrepreneurial outcomes (Bublitz and Noseleit, 2013 and Hartog et al., 2010 for instance examine entrepreneurial earnings). Suetzer et al. (2012, 2013) show that a balanced skill set contributes to the creation of a business and to the implementation of early stage activities. Oberschachtsiek (2012) found that experience in sales/business is one of the most

important factors in self-employment duration. Moreover, Rosendal Huber et al. (2013) show that a balanced skill set can be considered an aggregate measure at the team level.

This evidence however still leaves an open question regarding the characteristics of preentry career-patterns associated with entrepreneurial outcomes of individuals transitioning to entrepreneurship: how does the performance of new ventures whose founders have varied labor market experience in different firms compare to that of new ventures whose founders have a less varied background? The focus of this paper is on the role of the entrepreneur's pre-entry experience on the performance of the new firm in the early life-cycle stage of the new venture, when the founder's role is particularly important for the start-up's performance. Arguably, individuals who have accumulated pre-entry work experience in different firms, positions, and industries are likely to draw on a broader set of experiences and abilities than entrepreneurs with a less varied career history, who rely on a narrower set of knowledge and skills. Entrepreneurial outcomes are therefore considered to be the product of the various combinations of firms, positions, and industries in which entrepreneurs have worked prior to their transition to entrepreneurship. Past work experience contributes to a great extent to the development of new skills (Rosen, 1972), and for entrepreneurs, pre-entry experience in various firms, as well as in different positions and industries, can promote the qualities of jacks-of-all-trades and thus be associated to more successful entrepreneurs. The contribution of this paper is to provide a better understanding of the relationship between more detailed dimensions of the pre-entry work experience and their effects on entrepreneurial outcomes. By considering first-time Danish entrepreneurs and the details of their career histories with respect to the firms, positions, and industries, this study focuses on the new firms' survival. While distinguishing between failures and other types of exit, it is shown that job hopping has different effects for early and late-career entrepreneurs. Having managerial experience is correlated with a

higher chance of firm survival, and this holds true especially for entrepreneurs in the earlier stages of their career. Conversely, a large number of experiences in various firms is associated with a higher likelihood of failure. Furthermore, the higher the number of industries in which individuals have worked prior to the establishment of a new firm, the earlier entrepreneurs are likely to close down the firm and leave self-employment.

The remainder of the paper is organized as follows: the next section, section 2, contains references to the relevant literature; in section 3, hypotheses are developed; in section 4, details about the data and methods are provided; section 5 presents the results; and section 6 contains the conclusions and the discussion of the findings.

2.2 Theory

This paper builds on the idea that prior to become self-employed, entrepreneurs have acquired the combination of skills necessary to be able to efficiently assemble the required factors of production, consisting of human, physical, and information resources (Lazear, 2005, p. 649). In this view, compared to more specialized employees, entrepreneurs are at a disadvantage in terms of one single skill but combine a rich number of abilities that make them *jacks-of-all-trades*. When focusing on pre-entry experience and the transition to entrepreneurship, the prediction stemming from the jack-of-all-trades has received empirical support. Similarly, Åstebro et al. (2011) argue that a history of job hopping is associated with a greater likelihood of entry into self-employment, and use a Korean dataset to show empirically that a higher number of job changes is indeed positively related to transition into self-employment. Further, Åstebro and Thompson (2011) use a dataset of Canadian inventors to investigate the motivations governing the choices of a varied labor market experience; they find that greater variety in labor market experience results from the "taste

for variety" hypothesis, i.e. individuals are willing to forego income in exchange for non-pecuniary benefits deriving from variety in the labor market. Building on this evidence – that entrepreneurs have, *ceteris paribus*, a richer job history and more varied experiences compared to wage employees – the objective of this paper is to explore in more detail the relationships between the characteristics of entrepreneurs' pre-entry job experiences and the performance of the new venture.

How do entrepreneurial outcomes of individuals with highly varied work experience differ from entrepreneurs with a less varied career? More specifically, how do the characteristics of the entrepreneurs' pre-entry job hopping affect the performance of the new venture?

Delmar and Shane (2006) show a positive association between the entrepreneurs' past experience and start-up performance: the founding team's experience enhances both the survival and sales of the new venture, but these effects are non-linear, and vary with venture age. Pre-entry industry knowledge and managerial experience is argued to enhance the likelihood of survival for new firms, as confirmed by Dencker, Gruber, and Shah (2008), who further explain how learning activities may also be constrained or facilitated by the founders' pre-entry knowledge and experience.

Pre-entry experience is therefore key to understanding how the human capital accumulated can contribute to the performance of the individual as an entrepreneur. It can be argued that individuals might consider the labor market a resource for acquiring the skills and knowledge that will be pivotal for the establishment and management of their start-up. As shown by Rosen (1972), "a large fraction of the directly marketable skills possessed by individuals are not acquired from formal schooling, but rather from work experience". Experience in the wage sector provides skills, information, and abilities also useful for entrepreneurs (Chatterj, 2009; Unger et al. 2009).

In other words, learning can be seen as an investment in human capital that takes place in the job market. And this investment can be planned rationally, according to individuals' preferences, expectations, and abilities. Systematic differences do indeed emerge when considering the nature of human capital accumulated between the self-employed and the wage workers: prospective entrepreneurs invest more in general/portable human capital while they are wage employees compared to individuals that remain in the wage sector (Kawaguchi, 2003).

Arguably, pre-entry work experience can heavily contribute to the establishment of successful firms, given the strong relationship between the accumulation of the "right" human capital and the new firm's performance (Evans and Leighton 1989, Gimeno et al. 1997, Agarwal et al. 2004, Klepper Sleeper 2005, Denker et al. 2009). A pre-entry experience in a parent firm in the same industry as the start-up has been shown to have positive performance survival implications for the entrepreneurial venture (Agarwal et al. 2004; Dahl and Reichstein, 2007). Relevant industry experience (i.e. working in the same industry as the one in which the start-up operates) is one of the key results emerging from the literature.

In general, however, the pre-entry experience has not been studied specifically, and the literature has not devoted a great deal of attention to a detailed understanding of the specificities and facets of pre-entry experience and its effect on new ventures' performance. There are a few exceptions: Gimeno et al. (1997) differentiate between a general pre-entry human capital (i.e. knowledge and know-how that can be useful independently of the new venture) and a specific kind of human capital (i.e. knowledge and know-how that relates directly to the new venture). The authors find evidence of a positive effect of specific human capital on the survival of the new venture, but suggest that generic human capital does not seem to have an impact on survival. Also, Dencker et al. (2009) find that in the context of unemployed individuals, pre-entry knowledge and

management moderate the relationship between learning activities and firm survival. Roberts et al. (2013) uncovered the relationship between pre-entry experience and the start-up's product quality by showing that previous experience is detrimental to the new organization if founders remain close to the technical core of the organization. Moreover, Dahl and Reichstein (2007) argue that the characteristics of the parent company have a remarkable effect on the survival of the new venture. Specifically, entrepreneurs who survive longer come from the best firms, underlining how the context where they gathered pre-entry experience is of non-trivial importance. This evidence strongly suggests that the new ventures' performance is not homogeneously associated with the founders' various pre-entry experiences. For this reason, special emphasis is given here to the nature of entrepreneurs' background in order to identify the circumstances that contribute to the accumulation of human capital that will result in successful entrepreneurial outcomes. The idea of jack-of-all-trades is analyzed and considered along three different dimensions: 1) within the firm, 2) among the different firms, and 3) in the industries where individuals have accumulated their stock of human capital prior to becoming entrepreneurs. The performance of new firms is intertwined with the founders' set of knowledge, skills, and abilities. And the nature and variety of the entrepreneurs' background constitute the building blocks of the jack-of-all-trades, thus contributing significantly to the entrepreneurial outcomes. The crucial activities characterizing the entrepreneurial process as a whole are the recognition, judgment, and exploitation of opportunities (Shane and Venkataraman 2000). Interestingly, but not surprisingly, entrepreneurs tend to discover, identify, and exploit opportunities related to the information that they already possess (Shane 2000). Moreover, the process of acquiring salient knowledge can be thought of as an organizational search problem in which local search is less risky (Gruber et al. 2008). The ability to identify and consider more than one market opportunity is crucial to the success of the start-up, as shown by Dencker et al. (2008). In sum, the ability to identify opportunities can be seen as a function of the pre-entry work experience: Chatterji (2008) argues that work experience at an incumbent firm provides a number of valuable skills and resources for future entrepreneurs, including the ability to identify opportunities. Moreover, the parent company has an imprinting effect on the new organization. As argued by Sørensen and Fassiotto (2011), the organization is an "arena for learning", where employees accumulate knowledge and skills. These are then transmitted – or inherited – from the incumbent firms where founders have accumulated experience to the new context of the start-ups (Klepper and Sleeper 2005, Agarwal et al. 2004) and produce effects on the performance of the new firm.

2.3 Hypotheses and mechanisms

The arguments according to which founders' pre-entry experience affects the survival of the new firms rests on one assumption, namely, that if entrepreneurs explicitly and successfully choose to accumulate a variety of experiences in a variety of different firms as a means to obtain exposure to more information flows, different social networks, and resources in general while focusing on learning, they must be better at identifying, evaluating, and exploiting opportunities - in other words, at becoming successful entrepreneurs. Pre-entry experience examined as positions within the firm, various firm and industry affiliations, and the expected effects in terms of the new firm's survival are discussed in more detail in the present section of the paper.

1. Positions within the firm. Workers accumulate human capital through learning-bydoing and on the job training (Campion et al. 1994). Employees within an organization carry out different tasks and refer to the role assigned to them within the firm's hierarchy in order to perform the activities for which they are responsible. With different roles in the organization, they contribute to the execution of the various tasks. However, the resulting stock of human capital accumulated is not necessarily fully redeployed in a new context with ease, given the component of firm or task specificity, which is not easily exploitable in a new setting or organization. It follows that individuals dealing with broader tasks and less specific activities can be able to transfer more of their expertise and skills compared to individuals who are instead responsible for a less generalist role within the firm.

Managerial roles provide knowledge about functions (such as marketing) and consist of activities involving mediations with people both inside and outside the organization (Dencker et al. 2010). Furthermore, managers possess not only the skills and knowledge needed for supervision, but are also typically knowledgeable about the nature and requirements of the lower-level activities (Gibbons and Waldman 2004). Managers also minimize the underutilization of the human capital developed (Helfat and Lieberman 2002). As already pointed out, according to Lazear (2005), it is the accumulation of a generalist skill set that favors transition into entrepreneurship. And it is a higher degree of the *right* experience (Gimeno et al. 1997, Dencker et al. 2008), which is not underutilized (Helfat Lieberman, 2002), that enhances the new ventures' performance.

For these reasons, pre-entry experience in a managerial role is expected to be associated with better entrepreneurial outcomes:

H1 founders who have accumulated pre-entry experience in managerial positions will exhibit a lower hazard of firm failure

2. Firms Organizations contribute to the development of the human capital of employees, including those who at a given point decide to become entrepreneurs (Chatterji 2008, Sørensen Fassiotto 2011). In particular, start-ups originating from parent firms active in the same industry

benefit from a so-called "spinout advantage" (Agarwal et al. 2004, Klepper and Sleeper 2005, Campbell et al. 2012). One of the reasons is that departing employees transfer that knowledge and those organizational routines to which they were exposed while working in the incumbent firm. The same knowledge and skills will be at the basis of the success of the new entrepreneurial venture.

Also, existing organizations can provide the context in which opportunities are identified or help employees in developing an entrepreneurial mind-set (Sørensen Fassiotto 2011). However, as pointed out by Roberts et al. (2013), accumulating work experiences across organizational boundaries is associated with negative outcomes.

There is no reason however to expect that working in a large number of firms guarantees that such experiences will contribute in an additive fashion to the stock of knowledge and skills of workers. When moving to a new firm, the firm-specific human capital has to be set aside, and the more generic components can only be redeployed partially. The more diverse the firms in terms of industry and organizational routines, the more a newly hired workers must adapt.

One of the necessary conditions for the departing employees to be able to take with them knowledge and skills accumulated in the parent firm is to have spent a sufficient period of time in that organization. For a given time interval, an individual with experience in a number of different firms will likely have less in-depth knowledge compared to an employee stable in the same firm. The tendency to frequently change firm, the so-called "hobo syndrome" is associated with increases in the likelihood of future job separation. Moreover, frequent movers systematically obtain lower wages compared to stayers: the skills and knowledge developed with frequent moves seem to be less attractive (Munasinghe and Sigman 2004). This phenomenon can be seen as a by-product of the low quality of human capital developed by frequent movers. Accordingly, a high number of job changes is likely to be associated with difficulty in finding a good match between the individual and

the firm, which is the prerequisite for the acquisition of skills, abilities, or knowledge that might be fruitfully redeployed in the context of entrepreneurship. Hypothesis 2 is therefore:

H2 founders who accumulate a high number of pre-entry experiences in different firms will exhibit a higher hazard of firm failure.

3. Industries As noted for the firm-specific human capital, the experiences accumulated in a given industry cannot be fully applied to a different one (Neal 1995). Kaiser Møller (2011) also find support for the idea that industry-specific human capital is not applicable in all contexts, showing that an experience of self-employment does not produce a decrease in terms of salary for the self-employed who decide to return to wage employment in the same industry (while on the contrary a spell of self-employment in a different industry results in a lower wage). Abilities and human capital accumulated during work experiences in very different industries might be difficult to combine fruitfully and have a positive effect on entrepreneurial outcomes of the self-employed. Individuals who work in a large number of industries are therefore not likely to accumulate and successfully combine experiences that contribute to a balanced skill set useful to the jack-of-all-trades. The hypothesized relationship between number of industries and entrepreneurial outcomes is as follows:

H3 founders who accumulate a high number of pre-entry experiences in different industries will exhibit a higher hazard of firm failure.

In the previous section, the connections between the founders' pre-entry experience and the effects on the new firms' performance are analyzed, and their connections examined. However, one further important element should be introduced since individuals' experiences in entrepreneurship vary strongly according to their age. As noted by Levesque and Minniti (2006), aging reduces the

relative return to entrepreneurship (a type of work ensuring a stream of future returns), so that it becomes less and less attractive for older individuals (i.e. when the individuals' time endowment is smaller). Accordingly, motivation and the persistence of entrepreneurs at earlier stages of their career can be substantially different than those at later stages of their career. For instance, Detienne and Cardon (2010) document an inverse relationship between age and growth intentions, and Gimeno et al. (1997) find a negative relationship between age and performance threshold. In the same spirit, Aidis and van Praag (2007) show that only younger entrepreneurs benefit from accumulated pre-entry human capital, explaining how the non-conventional measure of human capital represented by a pre-entry illegal entrepreneurship experience translates into superior performance, but only for the young founders. When considering the knowledge and skills acquisition and accumulation associated with different firm affiliations it can be noted that jobs tailored for workers in earlier stages of their career entail a larger learning component than jobs designed for later career employees (Rosen, 1972): work at an early career stage is characterized by high levels of learning.

In this perspective, it can be thought that the outcomes of human capital accumulation via pre-entry experiences also vary with the age of founders: for older entrepreneurs, the impact of experiences in the labor market on the likelihood of becoming a jack-of-all trades will be smaller. This is expected because the investments in human capital vary by age, and in particular older workers are more likely to attend job-related courses and on-the-job training (Simpson et al. 2002), thereby focusing only on that component of the stock of human capital that is more firm-specific and not easily redeployable after the transition to entrepreneurship. Campion et al. (1994) show that job rotation is more common for employees in early career than for those in late career, suggesting that the former group may be more interested in the career benefits and the development of

managerial talent stemming from experience in different positions within the firm. Furthermore, Maurer (2001) notices that as age increases, workers' career-relevant learning and skills development declines. As Finegold et al. (2002) show, workers at the later stage of their career do not seem to take into great consideration opportunities to develop technical skills when planning decisions about moving to a new firm. Arguably, workers at the later stage of their career who are affiliated with a large number of different employers prior to entry into self-employment do not do so in order to broaden their abilities and qualify as jacks-of-all-trades.

These considerations point to the fact that at older ages the pre-entry experience might have a much softer effect on the component of human capital that is more general, and thus applicable to entrepreneurial roles. Older individuals tend to benefit less from pre-entry experiences, in the sense that learning is more oriented towards more firm-specific skills and knowledge that will not be decisive influences on the start-up's performance. Put differently, age will act as a moderator in the relationships between pre-entry experience and new firm performance:

H4a Age moderates negatively the relationship between pre-entry experience in managerial positions and the hazard of firm failure

H4b Age moderates negatively the relationship between the number of pre-entry experiences in different firms and the hazard of firm failure.

H4c Age moderates negatively the relationship between a high number of pre-entry experiences in different industries and the hazard of firm failure.

2.4 Data and methods

In order to ascertain the link between self-employed pre-entry experience and start-up performance, information about new firms and individuals is required. For testing the proposed

hypotheses, new firms consist of the Danish registered new businesses as resulting from the VAT register. Individuals who started a firm for the first time in 2003 have been selected, consisting of a total of 2813 first-time entrepreneurs. The year 2003 has been chosen since it makes it possible to follow entrepreneurs' history data until 2010, the most recent information available. Individuals have been tracked for the years 1995 to 2010, i.e. seven years prior to and after the transition to self-employment (which occurs, as mentioned, in 2003).

The information about individuals is obtained from Danish census data in the Integrated Database for Labor Market Research maintained by Statistics Denmark (referred to as IDA, from the Danish acronym). IDA covers the whole Danish labor force and makes it possible to track annually individuals, firms, and the individual-firm link. The sample so obtained includes the identifier of the employer for each individual, thus allowing to record the firm to which each individual is affiliated in each year. By selecting entrepreneurs in 2003, the pre-entry and job hopping variables are computed by considering the changes of employer/position/industry in the years prior to the transition to entrepreneurship (i.e. the years from 1995 to 2002). The dependent variable of interest, exit, corresponds to the firms' failure.

The model used to estimate this probability, conditional on a set of variables, is a duration model with discrete time. This is the most suitable model, since the event of leaving selfemployment can occur at any time of the year, but the data only allows observing the events of failure for each firm yearly. The hypotheses testing will therefore be performed by estimating a discrete duration model, which is best suited to predict the values of a binary dependent variable (here defined as the exit of the entrepreneur from self-employment) following a logistic distribution. The model predicts the probability of leaving self-employment as follows:

$$P(exit) = \frac{e^{(\beta_l x_l)}}{1 + e^{(\beta_l x_l)}}$$
(1)

Where βx represents a vector of covariates such that

$$\boldsymbol{\beta}\boldsymbol{x}_{i} = (\beta_{0i} + \beta_{1i}\boldsymbol{x}_{i1} + \dots + \beta_{ki}\boldsymbol{x}_{ki} + \varepsilon_{i})$$
(2).

Given potential problems of self-selection, the inverse Mills ratio has been included in the estimation; the appendix contains a detailed description of the first-stage model employed and the exclusion restrictions used. When considering the logit model estimating the likelihood of failure it can be noted that the variable of interest is only observed for individuals who actually experience a transition into self-employment. This can be thought of as a higher probability of individuals with high entrepreneurial abilities to become self-employed as compared to those with low entrepreneurial ability, who will be less likely to start a firm and thus enter the sample. In other words, the estimates are potentially biased by unobserved elements that determine whether the subjects enter the sample. A Heckman selection model is used in order to remove potential bias resulting from this self-selection¹. This consists of a two-stage estimation, the first stage being a probit model to account for the probability of entering the sample, defined as follows:

$$s_i = \phi(\beta_{0i} + \beta_{1i}x_{1i} + \dots + \beta_{ki}x_{ki} + \boldsymbol{\beta}_{ik}\mathbf{z}_i + \varepsilon_{si})$$
(3)

Where ϕ is the normal cumulative distribution function, $s_i = 1$ if the individual is selfemployed in 2003 (i.e. P(exit) is not missing) and $s_i = 0$ if the individual is not self-employed in 2003 (i.e. P(exit) is not observed). This probit is estimated for the whole population consisting of individuals who became entrepreneurs in 2003 and those who did not. $\beta_{1i}x_{1i} + \cdots + \beta_{ki}x_{ki}$ are the covariates explaining the transition to self-employment, while $\beta_{ik}z_i$ represents a vector of variables needed to identify the model such that $Cov(z_{i,}, s_{i,}) \neq 0$ and $Cov(z_{i,}, \varepsilon_{i,}) = 0$. Specifically,

¹ The estimation results of the first stage model are reported in the appendix
the exclusion restriction must be characterized by no correlation to the hazard of firm failure, but should explain some portion of the variable s_i , i.e. the transition to self-employment. Following Sorensen and Phillips (2011) and Nanda (2008), the first exclusion restriction variable is a dummy variable equal to 1 if the individual has a self-employed parent (*Parent is entrepreneur*). Moreover, another such variable is *partner is entrepreneur*, taking value 1 if the partner of the focal individual is an entrepreneur and 0 otherwise. Considering how the parents represent a role model, it might be thought that individuals with a self-employed parent might consider self-employment a more viable career than wage employment (Carrol and Mosakowsky, 1987; Gimeno et al. 1997). The new firms' performance and subsequently the hazard of closing the firms are linked to the entrepreneurs' preentry experiences and are not expected to be correlated to parents' employment.

In order to mitigate concerns about the exclusion restrictions used, the Sargant test for overidentification has been performed (the results are unreported), providing support for the appropriate choice of the variables included. Moreover, results are also robust when including only one exclusion restriction, namely, *Parent is entrepreneur*.

Dependent variable. In order to measure the survival of the new firms founded in 2003, a variable *exit* is generated, taking value 0 if the entrepreneur is observed as affiliated to the firm (s)he founded in 2003 and 1 otherwise. The firm is assumed to survive for the year in which *exit* is coded as 0 whereas a failure is assumed for *exit* equal to 1. Another categorical variable, exit2, is computed in order to discriminate between exits associated with failures and those that can be instead seen as successful exits. This variable takes advantage of a characteristic of the data that makes it possible to track a firm and its establishment(s). Exit2 consists of three different values and is computed by considering firms and the establishments connected to the firms. In particular it takes value 1 if the firm has been closed: the case in which the firm identifier is not present in the

firm register that year, and at the same time the establishment identifiers cannot be observed in that year. Exit2 takes value 2 if the firm does not appear in the firm register but the establishment is present: this case can with sufficient certainty be assumed to be an acquisition of the establishment by another firm. Exit2 takes value 0 otherwise. Such a variable will allow the estimation of a finetuned duration model through a multinomial logit.

Explanatory variables. The main explanatory variables are computed for the years 1995 to 2002. *Number of firms* ranges from 1 to 8 and measures the number of different firms each individual is affiliated with. If an individual worked in firm "A" until 1999 and changed to firm "B" in 2000 and no other change is recorded up to 2002, then *number of firms* will take value 2. In order to capture the voluntary moves between firms, i.e. the moves more likely to be explicitly associated with a form of planned career development, the number of firm changes is only recorded if the individuals are not unemployed for more than one month in the year in which the firm change is observed. *Managerial positions* measures the number of managerial positions that each individual has held prior to 2003, which is prior to the year in which the transition to entrepreneurship occurs. This information is also recorded annually. This variable builds on the classification of the positions of workers within the firm, and only includes the count of positions that involve managerial responsibilities. Finally, *Number of industries* contains information about the industries in which each individual has worked prior to entering self-employment. Industry changes are measured on the basis of the one-digit industry classification in order to capture broad industry switches.

Control variables. In order to take into account the characteristics of individuals that could potentially affect the hazard of leaving self-employment, a set of controls at the individual level is included in the model. These include *Female*, a dummy taking value 1 if the individual is female and 0 otherwise; *Education*, accounting for the highest level of education obtained by the individual

and consisting of a dummy taking value 1 if the individual has obtained a bachelor or higher degree and 0 otherwise; *Wage earnings* in 2002, i.e. the year prior to transition into self-employment; *Unemployment*, a dummy variable taking value 1 if the individual is reported to have experienced a spell of self-employment of at least six months in 2002; and *Wage experience*, the sum of the total years of experience in the wage sector as of 2002. This variable is highly collinear with age, and therefore age is not included in the estimations. *Spinout* is a dummy variable that takes value 1 for individuals who have started a firm in the same two-digit industry code of the parent firm and zero otherwise. Moreover, the model also includes firms' controls: *Industry* is a categorical variable taking into account the industry in which the new-firm is active (a one-digit industry classification including nine categories). *Year* captures the year effect and dummies are included for each year in which the firm-individual affiliation is observed.

2.5 Results

Table 1 contains the summary statistics and the correlation matrix. It can be noted that no pairwise correlation seems to create problems of multicollinearity.

***INSERT TABLE 1 ABOUT HERE ***

Managerial positions range from 1 to 3, showing that over the life span considered, individuals have held up to three different managerial positions. This relatively lower number compared to firm switches is expected, given that promotions to managerial roles can be thought of as having to do with internal career patterns. By contrast, *number of firms* can add up to 8, i.e. one different firm affiliation per year: this number is likely to be associated with workers who cannot find a suitable match with an employer, i.e. the "hobos". *Number of industries* captures very broad

movements across industries. Interestingly, the fact that its maximum is 6 reconciles with the idea that working in a completely different context implies a loss of expertise, skills, and knowledge (all of the industry-specific components), so individuals tend to move less across very different industries than they do across firms in the same industry.

Table 2 reports the estimation results of the discrete duration model on the hazard of firm failure, where marginal effects are displayed. Coefficients represent the effect of each covariate on the hazard of firm failure; therefore, a positive coefficient is associated with a positive likelihood of firm failure, while a negative coefficient implies a negative effect of the corresponding variable on the hazard of failure.

***INSERT TABLE 2 ABOUT HERE ***

Individuals who have held managerial positions show a lower risk of firm failure as displayed in specifications 1 and 2. This result confirms hypothesis 1. Moreover, the number of firm affiliations prior to transition to self-employment increases the hazard of firm failure, showing support for hypothesis 2. Also, a higher number of industry experiences is associated with higher likelihood of failure, which confirms hypothesis 3. These findings suggest that there might be an underlying complexity in the accumulation of a pre-entry experience resulting in useful entrepreneurial ability, which is not captured by observing a somewhat crude measure represented by the number of firm affiliations and experiences in various industries. Rather, the contribution of labor market experiences to the jack-of-all-trades is more likely to be a combination of appropriate correspondence of the workers' preferences and skills within the job and the firm and industry in general. A high number of firm/industry switches does not necessarily guarantee learning and the

assemblage of a broad set of skills useful in entrepreneurship. Instead, a good match between the firm and the individual is crucial, which is more likely to happen for workers at higher levels of the hierarchy, i.e. those with managerial responsibilities. In this respect, the results of this study are in line with Sørensen and Phillips (2011), showing among other things how better entrepreneurial outcomes are associated with longer tenure at the parent firm.

Figure 1 provides some evidence of the moderation effect that age exerts on the entrepreneurial outcomes. The graph shows the proportion of firms surviving organized by founders' career stage: *early career* comprises individuals who have been in the labor force for less than 16 years (the median value of wage experience); *late career* comprises the remaining entrepreneurs.

***INSERT FIGURE 1 ABOUT HERE ***

Although the Kaplan-Meier survival curve consists of a univariate analysis, it shows a tendency of entrepreneurs in the later stage of their career to display a lower hazard of failure, and this result is robust from the years following the first year and remains consistent until the last year in which the new firms are observed. In order to test for the moderation effect while controlling for the other important variables, model 3 of table 2 includes the interaction term between the term early career and number of managerial positions. The dummy early career is positive (yet the estimate is not very precise) and incorporates the higher likelihood of firm failure for early-career entrepreneurs. As for the interaction term, the negative and significant sign provides some evidence that the managerial positions held at an earlier stage of the career are those kinds of pre-entry experiences that are more strongly associated with longer firm survival. The plot of the interaction effect against the various levels of the predicted probability shows the true interaction effect on the

probability of firm failure. Figure 2 supports the results of table 2, showing that

***INSERT FIGURE 2 AND 3 ABOUT HERE ***

the interaction effect is consistently negative (as expected, the magnitude varies at the more extreme values of the predicted probability) and the plot of the z-statistic in figure 3 confirms that the effect is statistically significant at all levels of the predicted probability of firm failure.

The fact that in column 3 of table 2 the main effect of the number of managerial positions disappears also supports the idea that managerial experience will result in a more successful start-up almost exclusively for entrepreneurs in the earlier stages of their career. The effects of number of firms and industries are robust across the various specifications and also the magnitude of the effects remains unchanged; this result corroborates the idea that frequent job hopping has a detrimental effect on the survival chances of the entrepreneurial firm.

In table 3, model 2 from table 2 is estimated by splitting the sample according to the dummy early career.

***INSERT TABLE 3 ABOUT HERE ***

The results of table 3 show that the effects of the pre-entry experiences are strong and significant for the entrepreneurs in the starting phases of their career. This is consistent with the idea that at later career stages the willingness to absorb and re-combine new experiences and knowledge might be less efficient; this may explain why no significant effects are observed.

Furthermore, table 4 shows the results of a duration model with two different outcomes, namely, firm closure and other types of exit. By considering the possibility that entrepreneurs may successfully exit, the discrete duration analysis in table 4 makes it possible to isolate the effects of

our main variables on the hazard of firm failure in column 1 and on other exit, i.e. successful exits, in column 2.

***INSERT TABLE 4 ABOUT HERE ***

The coefficients for the pre-entry experience measures in column 1 of table 4 are strongly significant and replicate the findings of the previous specifications, while column 2 reports much less precise estimates. Such results contribute to the idea that the pre-entry experience accumulated has a stronger effect on firm survival but is to a lesser degree linked to successful exits. However, it should be taken into account that the number of successful exits represents a small fraction of all the recorded exits. Interestingly, unemployment results seem to be negatively and strongly associated with a successful exit, while wage experience seems to impact positively on firm closure and negatively on other exits, once again corroborating the idea that the career stages at which entrepreneurs found their firm might impact also on the performance threshold and outcomes (Detienne and Cardon 2010, Gimeno et al. 1997).

Finally, it is worthwhile briefly commenting on the other control variables: the presence of children in the entrepreneurs' family is associated with a negative hazard of failure, which can be due to a preference for a more stable career path and the flexibility provided by self-employment; *parent firm size* is instead positively associated with higher firm failure, supporting the idea that entrepreneurs spawning from larger firms tend to exit quicker.

2.6 Discussion and conclusion

The results presented in this study support the idea that the labor market experience of workers prior to becoming entrepreneurs has an impact on the performance of the new firms. The best performing firms are those founded by entrepreneurs who have accumulated generalist experiences by working as managers in established firms. By contrast, a high number of switches across firms and/or industries implies a higher hazard of failure. In general however, the pre-entry experience has a much sharper effect on the survival of new firms for entrepreneurs at the earlier stages of their career.

The contribution of this study can be articulated in four points. First, it complements the literature based on Lazear's (2005) jack-of-all-trades by unpacking pre-entry experience and characterizing it with some fine-grained measures, thus making it possible to test the theoretical prediction that individuals with a more varied background are better equipped to run their business and should therefore perform better. These relationships, observed for a representative sample of Danish start-ups and entrepreneurs, do not only make it possible to infer that entrepreneurs' pre-entry frequent job hopping does not seem to be beneficial for the survival of entrepreneurial ventures, although it is associated with a higher likelihood of transition to entrepreneurship.

According to the results, entrepreneurs benefit from a good combination of generalist skills acquired through a managerial experience. On the one hand, entrepreneurial skills can be seen as a product of the parent firms' characteristics such as size; on the other hand, another important element is the individual's ability to adapt and profit from those characteristics. Managerial experiences are the kind of pre-entry experiences more significant in terms of contributions to successful entrepreneurial outcomes but also represent the completion of one of the possible itineraries towards learning.

Second, the study offers a clearer description of the new venture's performance and its associations with pre-entry career patterns. While a varied career history of affiliations with numerous firms might be the antecedent to the transition to entrepreneurship (Åstebro et al. 2011, Silva 2007, Wagner 2006), the link to the performance implications for the new venture has not

previously been extensively explored, and not in such a fine-grained way. The results presented allow for clarification of one aspect of the learning-by-doing occurring in the labor market in the form of pre-entry experiences: the acquisition of abilities useful to entrepreneurs, i.e. a more generalist skill set, does not seem to be compatible with frequent job/industry switching.

Third, the study considers entrepreneurial outcomes in relation to entrepreneurs' career stages and shows that despite the fact that early career entrepreneurs have higher failure rates, it is this latter group that benefits from managerial experiences, with lower hazard of firm failure.

Fourth, a distinction is made between failures and other types of exit: the fine-tuned distinction of failures makes it possible to isolate the effects of pre-entry experience on the true survival of firms (although the market for entrepreneurial exit is not particularly developed in Denmark, i.e. failures represent the highest share of all exits).

However, the results presented should be interpreted with caution since the analyses do not allow a clear distinction of the extent to which the impact of entrepreneurs' pre-entry experience on the new firms' survival can be due to the investments in human capital or to a process of selection. It cannot be fully ruled out that the specific group of individuals with a particular tendency to prefer a more varied pre-entry experience is also the group of individuals less likely to succeed in entrepreneurship. However, if anything, the results seem to point towards the investment effect, since the pre-entry experience characteristics impact differently on entrepreneurs at different stages of their career. Holding ability constant over time, selection could be considered the driving force of the results if pre-entry experience did not affect early and late career entrepreneurs differently.

Further research should aim at developing a better understanding of the two effects and disentangling more thoroughly the driving forces behind the results.

One further consideration to be pointed out when discussing the results is that the time horizon considered is subject to left censoring insofar as it concerns individuals who entered the labor force prior to the starting point for observation in 1995. This consideration might lead to dispute about the robustness of the analysis regarding late-career entrepreneurship. On the one hand, it could be that precise estimation cannot be achieved since part of the individuals' history in the labor market is censored; on the other hand, it can be argued that the more recent experiences have the most power to influence entrepreneurs' skills while the effect of learning from activities performed long in the past is less crucial.

Additionally, earlier career entrepreneurs could systematically differ in the value they assign to the non-pecuniary benefits associated with self-employment; if this group has higher sensitivity to non-pecuniary benefits of entrepreneurship, longer survival could be also driven by a higher tolerance to a low-than-average income.

An interesting extension of this study could be to consider the pre-entry labor market characteristics of the self-employed over a longer time horizon in order to better describe the effects of mobility across various firms or positions, which are likely to be non-linear and decrease after a certain optimal point. Another element that could enrich the analysis of the pre-entry experience could be to consider growth rates; firms that experience high growth rates are likely to adopt certain hiring policies, and the effects on learning on the job could be substantially different than those experienced by workers in low-growth firms.

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Τ	able 1. Correlation	Matrix :	and Su	mmar	y Statis	tics											
		Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(2)	(9)	Ē	(8)	(6)	(10)	(11)	12)
E	Exit	0.236	0.424	0	1	1											
(2)	Managerial positions	0.557	0.697	0	б	-0.012	1										
(3)	Number of firms	2.583	1.32	0	8	0.112 -	0.011	-									
(4)	Number of industries	1.649	0.813	1	9	0.122 -	0.001	0.53	1								
(2)	Spinout	0.454	0.498	0	1	-0.213 -	- 0.027	0.062 -	0.168	-							
(9)	Wage earnings/10000	35.477	23.345	0	273.237	0.042	0.298	0.083 (.014 -(0.092	П						
ε	Parent firm size/1000	1.485	5.327	0.001	43.537	0.102	0.005 -	0.027	0.04 -(.174 -0	0.33	1					
(8)	Wage experience	16.448	7.96	0	39	0.008	0.213 -	0.225 -1	0.214 -(0 960.0	.258 0.	680	1				
(6)	Children	0.547	0.498	0	1	-0.046	0.036	-0.05	0.046 -(0 100.0	.094 -0	.016 0.	004	-			
(10)	Education	0.097	0.296	0	1	0.045	0.28	0.035 (.029 -(0.006 0	.309 0.	017 -0	.046 0.	.047	1		
(11)	(at least bachelor) Female	0.212	0.409	0	Т	0.068 -	0.024 -	0.059 -).036 -(.085 -0	0.127 0.	133 0.	003 -0	.051_0	.054	-	
(12)	Unemployment	0.002	0.046	0	1	0.011 -	- 0.004	0.009 ()- 980.(.011-0	.052 -0	.012 -0	.019 -0	.004 -(0.015 0	.033	-
(13)	Exit 2	0.248	0.461	0	7	0.971 -	0.014	0.103 ()- 111.(0.193 0	.035 0.	0- 10	.001 -0	.043 0	.038 (0.06 0	600

Tables

	(1)	(2)	(3)
		Firm exit	
Managerial positions	-0.039***	-0.039***	-0.014
	(0.012)	(0.012)	(0.014)
Number of firms	0.026***	0.026***	0.024***
	(0.007)	(0.007)	(0.007)
Number of industries	0.026*	0.026*	0.026*
	(0.010)	(0.010)	(0.010)
Early career		0.020	0.048+
		(0.025)	(0.027)
Early careerXManagerial positions		. ,	-0.057**
*			(0.021)
Inverse Mills ratio	-0.037	-0.036	-0.037
	(0.066)	(0.066)	(0.065)
Spinout	-0.175***	-0.174***	-0.172***
•	(0.017)	(0.018)	(0.019)
Wage earnings/10000	-0.000	-0.000	-0.000
0 0	(0.000)	(0.000)	(0.000)
Parent firm size/1000	0.006**	0.005**	0.005**
	(0.002)	(0.002)	(0.002)
Wage experience	0.001	0.002	0.002
	(0.001)	(0.002)	(0.002)
Children	-0.041**	-0.040*	-0.035*
	(0.016)	(0.016)	(0.016)
Education	0.019	0.019	0.027
(at least bachelor)	(0.027)	(0.027)	(0.027)
Female	0.056*	0.056*	0.055*
	(0.023)	(0.023)	(0.023)
Unemployment	-0.080	-0.080	-0.066
	(0.147)	(0.147)	(0.145)
Constant	0.165	0.040	-0.005
	(0.900)	(0.915)	(0.916)
Industry dummies	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes
Observations	9,039	9,039	9,039
Pseudo R2	0.203	0.203	0.204
Chi2	1526.825	1529.111	1528.948
Prob> Chi2	0.000	0.000	0.000
Log likelihood	-3933.475	-3933.175	-3929.467

Table 2. Discrete duration logit model on probability of firm exit

Robust standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05

	(1)	(2)
	Early career	Late career
	Firm	exit
Managerial positions	-0.065***	-0.008
	(0.018)	(0.016)
Number of firms	0.028***	0.014
	(0.008)	(0.012)
Number of industries	0.034**	0.014
	(0.013)	(0.017)
Inverse Mills ratio	-0.094	0.014
	(0.091)	(0.098)
Spinout	-0.177***	-0.161***
	(0.028)	(0.023)
Wage earnings	0.000	-0.001
	(0.000)	(0.001)
Parent firm size	0.008**	0.004 +
	(0.003)	(0.002)
Wage experience	0.004	-0.000
	(0.003)	(0.002)
Children	-0.029	-0.043+
	(0.021)	(0.024)
Education	0.044	0.024
(at least bachelor)	(0.035)	(0.044)
Female	0.083**	0.023
	(0.032)	(0.034)
Unemployment	-0.128	0.111
	(0.139)	(0.386)
Constant	0.458	0.031
	(1.243)	(1.386)
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Observations	4,839	4,200
Pseudo R2	0.186	0.239
Chi2	730.569	815.798
Prob> Chi2	0.000	0.000
Log likelihood	-2152.516	-1745.596

 Table 3. Discrete duration model on the probability of exit, by early career and late career entrepreneurs

Robust standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05

	(1)	(2)
	(1)	(2)
	Firm	Other exit
	closure	
Manageria	0 171***	0.050
Managerial positions	-0.171***	-0.058
NI 1 60	(0.049)	(0.156)
Number of firms	0.115***	0.008
	(0.029)	(0.098)
Number of industries	0.11/**	-0.014
F 1 G	(0.044)	(0.158)
Early Career	0.103	-0.190
	(0.107)	(0.341)
Inverse Mills ratio	-0.114	-0.058
	(0.277)	(1.039)
Spinout	-0.762***	-0.037
	(0.065)	(0.222)
Wage earnings	-0.000	-0.001
	(0.002)	(0.006)
Parent firm size	0.023**	-0.004
	(0.007)	(0.028)
Wage experience	0.012 +	-0.049*
	(0.007)	(0.022)
Children	-0.160*	-0.060
	(0.064)	(0.202)
Education	0.103	-0.273
(at least bachelor)	(0.115)	(0.459)
Female	0.252**	-0.138
	(0.097)	(0.350)
Unemployment	-0.295	-17.372***
	(0.613)	(0.527)
Constant	-0.316	-2.439
	(0.948)	(3.556)
Industry dummies	Yes	
Year dummies	Y	es
Observations	9,	039
Pseudo R2	0.1	207
Chi2	1970	8.475
Prob> Chi2	0.	000
Log likelihood	-426	9.897

Table 4. Discrete duration model with two different outcomes

Figure 1. Kaplan Meier survival estimates of early career vs. late career entrepreneurs



Note: thin lines represent the 95% confidence interval

Figure 2. Plot of interaction effects



Figure 3. Plot of z-statistics



Appendix

	(1)
	transition to
	entrepreneurship
Number of managerial positions	0.065***
	(0.010)
Number of firms	0.039***
	(0.006)
Number of industries	0.020*
	(0.009)
Wage earnings/10000	0.003***
	(0.000)
Partner is entrepreneur	0.199***
	(0.026)
Parent is entrepreneur	0.112***
	(0.033)
Parent company size/1000	-0.013***
	(0.002)
Wage experience	-0.012***
	(0.001)
Children dummy	0.097***
	(0.013)
Education	-0.079***
	(0.023)
Female	-0.227***
	(0.016)
Unemployment	0.270+
	(0.143)
Constant	-3.061***
	(0.059)
Industry dummies	Yes
Observations	1,324,710
Pseudo R2	0.052
Chi2	1819.208
Prob> Chi2	0.000
Log likelihood	-19073.699

Table 1. Selection equation. Probit on entry to entrepreneurship

Robust standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Note. The explanatory variables in table A1 include the job hopping measures, namely, number of past firm affiliations, managerial positions, and firms prior to the transition to self-employment, and the excluding variables are the dummies Parent entrepreneur=1, if the mother or the father of the entrepreneur are self-employed, and Partner is entrepreneur=1, if the partner is an entrepreneur in the founding year.

3. Unpredictably Stable. An Investigation into the Stayer-Mover

Tendencies among Self-Employed

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Abstract

Does entrepreneurship lower individuals' employment turnover rates? The paper offers two reasons why this is the case – a matching mechanism and a lock-in effect. The paper offers theoretical justifications and seeks to empirically disentangle the two mechanisms. A matched employer-employee data covering the entire Danish labor force warrants the identification of a matched sample of entrepreneurs and non-entrepreneurs useful for rigorous analysis. The analysis reveals that self-employed stay longer in their employment status compared to individuals in paid-employment. This is shown to be likely due to reduced attractiveness in the wage sector and sunk costs related lock-in effects. Results, however, also indicate that entrepreneurship may resolve mismatches of individuals in the labor market. This counterintuitive finding – self-employment yields greater employment stability – has fundamental implications for the understanding of the returns (labor market outcomes) to entrepreneurship.

3.1 Introduction

Self-employment is often considered an unstable and risky occupational choice caused by high exit rates among newly started businesses (Taylor, 1999). 24 out of 100 start-ups exit within 2 years of establishment (Bruderl et al., 1992), almost 50 out of 100 exit within 5 years (Taylor, 1999) and nearly 50 out 100 self-employed go back to the paid employment within 7 years (Evans and Leighton, 1989). Given the high exit rate among newly founded firms, it is plausible that self-employed individuals exhibit higher turnover rates than comparable wage earners. However, self-employment may represent an endogenous treatment effect precipitating more stable professional affiliations for two reasons. First, the self-employed may have skills and human capital making them suitable for this career path and hence better matched in self-employment than in paid employment. Second, lock-in effects may be particular severe in self-employment settings leaving the founder little choice but to remain in this occupational affiliation. While the former suggest a positive gain due to improved matching on the labor market the latter may, on the contrary, be an undesirable outcome causing individuals to be stuck in positions where they are mismatched. Separating these mechanisms is hence of major importance.

Evidence suggesting that transition to self-employment is associated with a lowering of the individual's employment turnover rate is interesting for several reasons. First, extant literature indicates that self-employed exhibits above average employment turnover rates ex ante transitioning to self-employment (see e.g. Åstebro and Thompson, 2011). Evidence suggesting a lowering of employment turnover rates ex post self-employment can ascribe this empirical regularity to occupational contexts and/or an interaction with individual preferences and not an innate attitude among entrepreneurs.

This investigation requires an analytical design, which takes into account that the choice to become self-employed is endogenous with respect to employment turnover. This is not least reflected in the fact that self-employed individuals exhibit high employment turnover rates ex ante transitioning. We model this endogeneity by identifying individuals that become self-employed for the first time (treatment group) in 2002, and form a comparable group of workers through a comprehensive matching procedure (control group) exploiting longitudinal labor market, demography, and social relations data and how changed jobs in 2002 and had not been self-employed previously. The data map the employment history of the entire Danish labor force. The control group becomes a proxy for the unobserved behavior of the treatment group had the entrepreneurs not chosen self-employment.

We disentangle the lock-in mechanisms in the interests of isolating the matching effect. We use a Mincer equation specification to estimate the predicted wages of subjects, and include them in our model as a control for lock-in related to the labor market value. We also run the analysis on a sub-sample of self-employed venturing into low sunk cost industries, thereby controlling for variations in employment turnover relating to investment in self-employment settings. This allows us to more stringently disentangle the lock-in effect from the high-quality match effect.

Our analysis supports the notion that self-employment is associated with a lowering of employment turnover. The observed regularities can be ascribed to both lock-in effects and a sorting effect with high quality job matching. Our results persist if we restrict the sample to individuals leaving a job due to lay-offs (necessity movers) rather than active choice while in employment, providing further support for the argued effects rather than unobserved factors. In a supplementary analysis, we show that these results hold only with respect to the transition to paid work and do not emerge for the transition to entrepreneurship, providing additional evidence of an effect operating through quality matching.

The remainder of this paper is organized as follows. Section 2 develops the theory. Section 3 describes the data, sample construction, and method. Section 4 presents the results, and section 5 concludes and discusses the implications of our findings.

3.2 Theory

The Mover-Stayer model, developed by Blumen, Kogan, and McCharthy (1955), predicts that some workers (identified as *movers*) are inherently more likely than others (identified as *stayers*) to move between jobs. A positive correlation between employment turnover and the likelihood of future job change has been established. However, an individual's mover-stayer behavior may change over time, suggesting individual time-invariant characteristics do not uniquely explain the relation between mobility patterns and job change.² This is consistent with recent evidence indicating that the relationship between past mobility and current turnover is not structural, since the effect persists after controlling for individual fixed effects (Munasinghe and Sigman, 2004).

High employment turnover rates are attributable in part to skills being experience goods, creating the potential for asymmetric information where productivities are revealed only after hiring (see e.g. Greenwald, 1986, Hölmstrom, 1979, Nelson, 1970, Sørensen and Sharkey, 2014). As a consequence, high employment turnover rates may be associated with poor matching in the labor market, and may trigger costs.

² Abbring J.H. Abbring. 2002. Stayers versus defecting movers: a note on the identification of defective duration models. *Econ Lett.* **74**(3) 327-331. extends the Mover-Stayer model to account for defecting movers, i.e. movers typically at risk of moving, but not eventually moving. This group exists if the hazard rates of moving decrease sufficiently quickly with duration, for instance exponentially ibid. Movers to self-employment might be regarded as "defecting movers", because their time to transition decreases exponentially till it approaches stayer behavior.

Self-employed have been identified as a group of individuals for whom employment turnover rates are relatively high ex ante transitioning to self-employment (Åstebro and Thompson, 2011). Intuitively, it is sensible to think that transition to self-employment in fact will increase the turnover rate or at best keep it at the same level considering the high failure rate of newly started businesses. However, there are reasons to believe that transition from paid-employment to entrepreneurship might induce a shift from mover to stayer behavior. Put differently, there are reasons to believe that change of employment status to self-employment may act as an "endogenous" shock that reshapes the individual's mover-stayer tendency. We identify two mechanisms that may contribute to this change in mover-stayer tendency: job matching and lock-in effects.

3.2.1 Job Matching

Workers remain in jobs in which their productivity is revealed to be relatively high (high quality match) and select out of jobs where their productivity is revealed to be low (low quality match) (Jovanovic, 1979). This explains the stylized fact that tenure (time with the same employer) and future job change are inversely correlated. Higher match quality reduces search for external opportunities and the likelihood of accepting an eventual offer, resulting in lower probability of employment turnover.

There are three reasons why self-employment may represent a high quality match occupational choice for some individuals. There is a prevalent tendency for self-employed individuals to value independence (Gimeno et al., 1997). Preference for independence may trigger agency problems in wage earnings wherefore these individuals tend to exhibit above average turnover rates. It also explains why a significant number of entrepreneurs report disagreement with a prior employer as a primary motivation for the transition to entrepreneurship (Garvin, 1983, Klepper, 2007, Klepper and Thompson, 2010). Transitioning to entrepreneurship collapses agent (employee) and principal (employer) into a single entity. As a result, such agency-problems are not present in entrepreneurship settings (Lazear, 1981) and lowers these individuals tendencies to transition to new professional affiliation.

Second, entrepreneurs often display high turnover rates ex ante transitioning to selfemployment (Astebro and Thompson, 2011). This endows them with above average variety of experiences and hence skills thereby making them generalists. Generalists tend to be undervalued in paid employment both because the hiring process and the reward system are based on employee's specialized knowledge and means that, in paid employment, specialists earn higher income than generalist (Lazear, 2004). Self-employment offer high returns for generalist skills (Lazear, 2004) and wage offers received by individuals' with a high employment turnover history may be relatively low value in paid employment making self-employment more attractive from a quality match perspective. Entrepreneurship may hence lower their turnover rates.

Third, established firms have often gone through transformations resulting in reliance on division of labor and specialized work tasks (Mintzberg, 1979), which limits the scope of operation particularly for individuals with a varied set of skills. Consequently, high employment turnover individuals may face the problem of redeploying their stock of human capital into new paid employment settings. Research shows that redeploying firm-specific human capital into a new organization is easier than trying to craft it within an existing one (Campbell et al., 2012). Moving to an established firm may exacerbate inertial tendencies to the extent that differences in corporate culture hinder the matching process. Higher levels of human capital redeployability enhance employment stability by increasing the perceived match. Individuals with generalized

skill sets can increase the quality of the match through self-employment rather than paid employment by tailoring their venture to suit their particular qualities, thereby increasing the quality match through actively shaping their new work setting to preferences and skills causing a lowering of employment turnover tendencies.

3.2.2 Lock-in Effects and Duration in Self-Employment

Individuals selecting into entrepreneurship are at risk of becoming locked into the entrepreneurial setting, lowering their employment turnover tendencies *ex post* transition to entrepreneurship. Arguments in favor of lock-in effects call into two categories: a) selection and treatment effects, and b) investment effects.

<u>Selection and Treatment Effects.</u> Selection-based lock-in effects emerge from a sorting of low ability individuals into and out of entrepreneurship. Individuals select into entrepreneurship based on unobservable attributes associated with poorer wage sector outcomes compared to those of individuals who remain in the wage sector (Bruce and Schuetze, 2004). Observed wage discounts or the inability to re-enter the wage sector may thereby be explained by ex-ante heterogeneity in observable (wages) and unobservable ability in paid employment. The evidence suggests that this selection acts to promote a significant lock-in effect for entrepreneurs (Bruce and Schuetze, 2004, Hyytinen et al., 2013, Hyytinen and Rouvinen, 2008). Åsterbro et al. (2011) suggest that entrepreneurs come from both the upper and lower tails of the ability distribution. Yet, there are also reasons to believe that entrepreneurs predominantly are drawn from the lower tail of the wage distribution (Elfenbein et al., 2010) where their opportunity costs are relatively low making it unattractive to move to paid employment. Consequently, entrepreneurs experience a lock-in due to relatively poor outside options (Arora and Nandkumar, 2011). For the same reason, poorly performing start-ups may continue in business because the founder's economic returns in alternative employment opportunities are low (Gimeno, Folta, Cooper and Woo, 1997). Furthermore, this also resonates with highly educated entrepreneurs tend to be more likely to exit thus moving to an alternative employment based on the rich set of employment opportunities outside entrepreneurship (Taylor, 1999).

There are, however, wage discounts beyond the effect of negative selection in entrepreneurship that provide indirect support for treatment effects (Hyvtinen, Ilmakunnas and Toivanen, 2013). Entrepreneurship, as a profession, imposes effects that inherently alter founders' subsequent opportunities to return to waged employment. Entrepreneurship may cause depreciation in firm-relevant human capital (job-specific skills) previously gained in the wage sector. Entrepreneurs may lose valuable labor market experience and opportunities for training or advancement in the firm or industry in which they previously worked (Bruce and Schuetze, 2004: 576). Entrepreneurship is a treatment that causes potential employers to discount ability and the value of entrepreneurs, and consequently offer wages below their reservation wage precipitating a lock-in due to relatively poor outside options. Time in self-employment increases the development of entrepreneurial human capital, which might be largely irreversible when moving back to established firms. The option to discontinue the entrepreneurial venture may be unattractive since the alternative may be a job in which the specific human capital acquired is relatively unproductive creating the prospects of dissatisfactory work conditions. The entrepreneurs thus face switching costs which combined with inertial tendencies (Gimeno, Folta, Cooper and Woo, 1997) may contribute significantly to serial entrepreneurship.

Empirical evidence suggests the existence of a lock-in treatment effect from entrepreneurship showing negative returns to entrepreneurship in the wage sector (Bruce and Schuetze, 2004,

Evans and Leighton, 1989, Hyytinen and Rouvinen, 2008).³ A spell in entrepreneurship may reduce future prospects in paid employment or discount the wage of those re-entering paidemployment. Bruce and Schuetze (2004) find that an additional year in entrepreneurship reduces future earnings in the wage sector by anywhere from 3% to 11% for men, increases the probability of unemployment by anywhere from 3% to 10%, and increases the probability of part-time employment by 10% to 30%.

A different source of treatment effect may emerge because entrepreneurs may suffer from the stigma of failure (Landier, 2006). Seeking opportunities outside the firm may send signals that lower the offered wage in paid employment. Indeed, Hyytinen and Rouvinen (2008) find support for the notion that entrepreneurs may be "scared" of exiting since frequently they are treated unfairly upon returning to paid employment.

<u>Investment effect.</u> Setting up a firm requires investment in physical and human capital. Some of these investments represent sunk costs, which cannot be recouped after committing to the investment. The amount of sunk costs varies widely across industries and contexts (Sutton, 1991). Sunk costs hamper entry (Geroski, 1995) and make it difficult to find financing for a new venture. Sunk costs also may inhibit the decision to exit (Harrigan, 1981). While decisions about exit solely should be based upon future prospects, it has been shown that it may be rational to consider sunk costs if the future is uncertain (Dixit, 1992) which would apply to entrepreneurial settings. Accordingly, the ability to recover past investment may be central to whether the

³ Some have questioned this finding and even argue the opposite to be the case B.A. Campbell. 2013. Earnings Effects of Entrepreneurial Experience: Evidence from the Semiconductor Industry. *Manage Sci.* **59**(2) 286-304, R.W. Fairlie. 2002. Drug dealing and legitimate self-employment. *J Labor Econ.* **20**(3) 538-567, B.H. Hamilton. 2000. Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment. *J Polit Econ.* **108**(3) 604-631, U. Kaiser, Malchow-Møller, N. 2011. Is self-employment really a bad experience?: The effects of previous self-employment on subsequent wage-employment wages. *Journal of Business Venturing.* **26**(5) 572-588, C. Tergiman. 2011. Entrepreneurship does pay. *Working PaperUniversity of British Columbia, Vancouver.*. If the pecuniary returns from entrepreneurship experience are positive, our estimates will tend to be conservative, thereby strengthening our findings rather than weakening them.

entrepreneur considers closing down the firm. In case of high sunk costs the firm founder might choose to keep the company operating even when performance is poor (see e.g. Gimeno, Folta, Cooper and Woo, 1997). The founder becomes locked into entrepreneurship through the prior decisions on investment related to start-up.

3.3 Data and Method

3.3.1Data source and sample construction

We use the Danish labor market database maintained by Statistics Denmark (IDA) to examine the association between transition to entrepreneurship and shifts in employment turnover tendencies. IDA is a matched employer-employee dataset tracking individuals and their firm affiliations over time, covering the entire legal resident active labor force in Denmark. The labor market in Denmark is comparable to the U.S. labor market along several dimensions such as employment protection, average employment turnover, and rates of entrepreneurial entry and exit (Sørensen, 2007). The data are yearly panel data for 1999 to 2008, and provide information on individuals, affiliations, and social and demographic circumstances. All information about employer-employee affiliations is updated yearly by Statistics Denmark.

The data are particularly suitable to test our claim about the mover-stayer tendencies of entrepreneurs because they allow us to address three important methodological challenges associated with this empirical inquiry. First, the data include information on individuals who *did not* transition to entrepreneurship, allowing us to define a suitable counterfactual sample. Second, they provide comprehensive data characterizing the career histories of individuals at the onset of risk. Third, they allow precise identification of changes in individuals' firm affiliations across time. Specifically, the occupation of an individual in a given year is determined by

Statistics Denmark according to the individual's primary labor market status in the last week of November.

We identify a sample of individuals who became entrepreneurs in 2003. Using 2003 allows us to track individuals 4 years back and follow them 5 years forward in time. We define an individual as an entrepreneur if s/he is registered in the Danish entrepreneurship database as the primary founder of a newly started firm. In order to isolate the treatment effect of entrepreneurship on individuals' employment turnover tendency, we focus only on first time entrepreneurs. We categorized the individual as a first time entrepreneur if we found no registration of the individual having established a firm in the previous 5 years.

In order to further minimize heterogeneity, we impose additional restrictions on our sample of entrepreneurs. First, in order to eliminate biases attributed to those who are not likely to be fulltime in the labor force during the period under consideration, we exclude individuals aged less than 18 years in 1999 individuals aged over 60 years in 2003. The latter of these is done to avoid right censoring due to standard retirement. Second, individuals who are affiliated with more than one firm in the form of either wage-work or second start-up in a given year are excluded because hybrid transitions involve distinctive logics (Folta et al., 2010) to which the proposed mechanisms may not apply. Third, we exclude individuals working in the agriculture, fishing and quarrying industries because the labor market dynamics in these industries differs from other industries, and in order to maintain comparability with prior studies of entrepreneurship (Nanda and Sørensen, 2010).

Our final sample includes 1,257 first-time entrepreneurs in 2003.

3.3.2 Construction of the Matched Control Group of Non-Entrepreneurs

Investigating whether entrepreneurship lowers individuals' employment turnover tendencies implies an important inferential challenge. Entrepreneurs are not a random sample of individuals. Growing empirical evidence suggests that individuals self-select in entrepreneurship based on certain attitudes, such as a preference for autonomy (Sørensen, 2007) or a taste for variety (Astebro and Thompson, 2011) and abilities, such as generalist skills (Elfenbein, Hamilton and Zenger, 2010, Lazear, 2005). Our claim that entrepreneurship lowers employment turnover might be a spurious result of a selection effect if these observable and unobservable characteristics are also associated with job change tendencies. We address this potential selection issue by employing counterfactual analysis. The counterfactual here is a yardstick for moverstayer behavior of a comparable individual who was equally likely to transition to entrepreneurship but chose not to. The counterfactual theoretically represents what the subject of interest would have done had he not made the choice to transition to entrepreneurship.

To find this counterfactual we create a matched sample of wage-workers comparable to our sample of entrepreneurs, across a set of observable covariates associated with individual selection into entrepreneurship *(selection into treatment)*. To identify a control sample, we draw on labor market data identifying all workers who changed job in 2003 (movers). Focusing on newly hired employees allow us to assume the two groups share the same onset of risk of moving. The underlying assumption is that individuals do not plan to move even before they start working in a new context. Put differently, we assume an exact matching of the timing of prior movement. Similarly, since we only consider first-time entrepreneurs, we also impose that the matched employee has not been classified as self-employed in the previous 5 years. We impose the same age restrictions on the control sample as applied to the entrepreneur sample. This

results in a sample of potential matched wage earners who transitioned to a new job in 2003, who were not entrepreneurs in the 5 years prior to 2003, and who were not younger than 18 in 1999 or over 60 in 2003.

We use propensity score matching technique (Rosenbaum and Rubin, 1983) to identify the matched group. This methodology has been used to address potential selection bias in studies of entrepreneurial outcomes (e.g. Campbell, 2013, Kaiser and Malchow-Møller, 2011). The group is obtained by identifying an entrepreneur's nearest neighbor within the group of newly hired employees in 2003 (one-to-one match). To improve the quality of the matching model, we choose to use an exact matching specification on gender (*female*) since there could be systematic differences across females and males in the propensity to leave current employment. This is in line with the gender gap identified in entrepreneurship (Fischer et al., 1993).

The variables used for the matching procedure are lagged 1 year, since matching is aimed at reflecting individuals' characteristics just before the 2003 transition. Ideally, the matching model includes variables that affect both selection into treatment (i.e. entrepreneurship) and the dependent variable (i.e. *ex post* employment turnover). In selecting the variables, we consider the extensive empirical literature addressing the determinants of entry into entrepreneurship and employment turnover.

3.3.3 Variables

<u>Dependent variable</u>. The dependent variable, *transition to a new job*, is a dummy that indicates whether an individual changed her/his occupational affiliation. It contrasts individuals that remain in the same firm of affiliation in 2003 (transition=0) with individuals that move to a different occupation (transition=1). We use a more fine-grained specification of this measure as a robustness test to explore where individuals go after a transition occurs. This alternative measure

is a categorical variable where zero denotes that the individual persists in his/her 2003 affiliation, 1 denotes a move to a(nother) wage employment affiliation, and 2 denotes a move to (a new) entrepreneurship occupation.

Explanatory variable. Our main independent variable is *entrepreneur*, a dummy which equals 1 if the individual becomes an entrepreneur in 2003 (treatment group) and 0 if s/he moved to a new job in 2003 (matched group). Entrepreneurs are identified using the Danish entrepreneurship database, which is maintained by statistics Denmark and linked to labor market data through a personal identifier. This database registers the primary founder of each newly founded firm.

Matching variables. Entrepreneurs are characterized as jacks-of-all trades or having a taste for variety (Åstebro and Thompson, 2011, Lazear, 2004). Such characteristics are highly collinear with the tendencies to change jobs and for professional challenges. Therefore, it is important to ensure that the control and treatment samples are comparable in terms of these characteristics. We employ two variables that indicate prior employment turnover tendencies. The *number of firms* the individual has been affiliated with in the years between 1999 and 2002 and the *number of industries* the individual has been affiliated with in the same period. Using these measures as controls and matching variables ensures that the samples are comparable in terms of moverstayer tendencies prior to the onset of risk, thereby equating the groups on variables that are directly related to the dependent variable in line with prior research on past employment turnover rates and the likelihood of changing occupation predicted by the Mover-Stayer model (Blumen, Kogan and McCarthy, 1955).

The control and treatment samples are matched on a number of demographic variables. First, parents may act as role models: individuals with *entrepreneur parent(s)* may exhibit a higher likelihood of becoming an entrepreneur (Carroll and Mosakowski, 1987, Nanda and Sørensen,

2010). We use a dummy to account for an entrepreneur parent by considering whether at least one of the individual's parents was as an entrepreneur between 1999 and 2002. Civil status may also have an impact on both entrepreneurial activity (Folta, Delmar and Wennberg, 2010) and employment turnover. We match based on whether the individual is *married* or not. We include a gender dummy for whether the individual is *female*. Having children may dictate a more stable professional affiliation and has been argued to have an impact entrepreneurial venturing, thus we also match on the presence of *children* younger than 18 year of age in 2002. Individuals with higher education have different opportunity costs and face a different labor market than less highly educated employees. For this reason, we match on whether the individual has a *bachelor* degree or higher. The demographic variables have been proven to be correlated with individuals' employment turnover tendencies.

We match on four variables related to professional status and conditions. First, number of years in the labor market may affect mover-stayer tendencies through switching costs. We control for *wage experience* by including a variable for number of years the individual was active in the labor force since 1979. Wages may have an impact on the likelihood of moving since they account for a major share of the decision to accept or reject a job. Furthermore, there is evidence suggesting a link between *wage earnings* and entrepreneurship (Åstebro and Chen, 2014). We use log of salary from employment status in 2002 as a matching variable. We control also for employer size since it has been shown that there are differences in entrepreneurial activity based on leaving a large as opposed to a small firm (Elfenbein, Hamilton and Zenger, 2010, Sørensen, 2007). There are also good reasons to suspect that larger firms might differ in employment turnover tendencies compared to small companies. We therefore match on *employer size* by number of employees in the firm to which the individual was affiliated in 2002. Finally,

we match on whether the mover tendency in 2002 to 2003 was based on necessity. Necessity moves increase employment turnover and often result in necessity entrepreneurship (Koellinger and Thurik, 2012). We control for *necessity mover* by including a matching variable measuring whether the firm to which the individual was affiliated in 2002 had ceased to exist in 2003.

<u>Controls.</u> We control for year and industry fixed effects using several dummies. Industry dummies represent the industry of the new employer in the case of employees (control), or industry of the new firm in the case of entrepreneurs (treatment). These measures are coded in 2003 and defined at the one digit level (NACE code standard). The industry groups in our sample are as follows: manufacturing, construction, wholesale and retail trade, hostels and restaurants, transport storage and communication, financial intermediation, public and personal services.

3.3.4 Method

The data are organized for event history analysis since the research question specifically dictates a duration set-up for the investigation. We employ a discrete time duration specification since the data are yearly registrations but the transition event can take place at any point in time in between the registered observations. Specifically, we use a logit specification predicting the probability of transitioning to a new professional affiliation. We also considered a Cox proportional hazard specification finding the results unchanged suggesting them not to be a by-product of the chosen model.

The validity of the matching procedure hinges on the assumption that we can eliminate all systematic differences affecting both outcome (employment turnover) and selection into treatment (entrepreneurship). We perform several checks to test the validity of our model. We ran t-tests and chi-square tests across all matching variables. Table 1 reports the descriptive
statistics for the matching variables. It displays the variable means across entrepreneurs and nonentrepreneurs *before* and *after* the matching procedure, and provides results for the tests for significant differences in the variable mean values. We also report descriptive statistics for individuals classified as wageworker stayers in 2003 (Table 1 column 6). The data suggest that our considered sample of entrepreneurs, on average consists of movers rather than stayers since the number of firms and number of industries in the previous 4 years are significantly greater among the entrepreneurs.

*** INSERT TABLE 1 ABOUT HERE ***

A comparison between entrepreneurs (Table column 1) and all newly hired employees (column 4) before the matching procedure, shows that these groups are quite different along several observable dimensions. The value of these differences corresponds closely to those reported by previous studies comparing entrepreneurial entry vs non-entry using U.S. data (Campbell, Ganco, Franco and Agarwal, 2012, Hamilton, 2000). The table generally confirms our expectations with regard to entrepreneurs and their characteristics compared to wage earners. However, two things should be highlighted. First, on average, entrepreneurs seem to have less varied job histories (*number of firms*) compared to wageworker movers. This evidence contrasts with the literature and theories of jacks-of-all trades and taste for variety (Åstebro and Thompson, 2011, Lazear, 2004) predicting entrepreneurs will have held more jobs than non-entrepreneurs. However, it is important to highlight that these results consider only movers and cuts off the lower tail of the distribution. The higher values of *number of firms* for employees therefore reflects the well-known empirical regularities that movers tend to move more than

stayers, which is evident if we compare columns 6 and 1. Second, Table 1 shows that an entrepreneur's pre-transition wage is higher than an employee's wage. Prior work provides evidence of both positive (Hamilton, 2000) and negative selection (Bruce and Schuetze, 2004, Evans and Leighton, 1989) into entrepreneurship. This mixed evidence has resolved in more recent studies which find bimodal entry patterns, with those at the top and the bottom of the earnings distribution more likely to select into entrepreneurship (Åstebro, Chen and Thompson, 2011, Elfenbein, Hamilton and Zenger, 2010). A more detailed look at the nature of the significant difference in earnings between entrepreneurs and wageworkers shows that it is attributable to a few extreme earners among the entrepreneurs.

Following the matching procedure, comparison between entrepreneurs and matched employees (Table 1 columns 3 and 4), shows that there are no statistical differences along observable covariates across the treatment and control groups, lending support to our matching model. We ran a probit regression to explain the likelihood of selecting into the treatment group rather than the matched group, using the conditional variables used in the matching procedure. Table 2 reports the results of the probit model. The overall validity and explanatory power of the model is poor, expressed in the insignificant values of the coefficients of all the matching variables and the Wald test. The pseudo R-square is also very low suggesting relatively poor ability to explain the variation in the dependent variable.

*** INSERT TABLE 2 ABOUT HERE ***

To conclude, we do not observe systematic differences between the treatment and control groups either for individual variables or when considering the covariates together in the probit.

Given that the matching variables are appropriate, we can conclude that the matching procedure is successful in terms of providing a comparable yardstick of non-entrepreneurs for our analysis.

Table 3 reports the descriptive statistics and Pearson correlations between the variables when considering the sample of entrepreneurs and matched non-entrepreneurs used in the main analysis.

*** INSERT TABLE 3 ABOUT HERE ***

3.4. Results

3.4.1 Effects of Entrepreneurship on Employment Turnover

Figure 1 report the results of the Kaplan-Meyer survival function estimates for time to employment turnover for entrepreneurs and the matched control group of employees. Figure 1 provides preliminary support for our prediction since entrepreneurs systematically stay longer in their employment status compared to employees. A log rank test confirms that there are significant differences between the respective survival curves for entrepreneurs and wage earners.

*** INSERT FIGURE 1 ABOUT HERE ***

Table 4 presents the results of the discrete time duration model. Column 1 shows the results for the initial model where we do not separate the various proposed theoretical effects. The coefficients of our main explanatory variable, *entrepreneur*, indicate that entrepreneurs are less likely to change jobs compared to matched employees, supporting the overall claim in the paper.

Indeed, the estimate is significant at the 1% level suggesting strong support for the overall proposition.

*** INSERT TABLE 4 ABOUT HERE ***

3.4.2 Effects of Lock-in on Employment Turnover

Theoretically, we identified two primary reasons why we would observe a lower employment turnover among entrepreneurs than comparable non-entrepreneurs; quality match and lock-in effects. By separating the two, we are seeking a more detailed understanding of the empirical evidence presented above. We do this by controlling for lock-in effects and investigate whether this has explanatory power related to the quality match argument.

We forwarded two types of lock-in effects: a) selection and treatment based effects, and b) investment effects. The first suggests that the individual may face a lower wage when returning to wage employment suggesting that individuals will find this option unattractive. The second suggests that entrepreneurs operate under severe uncertainties and rationally consider sunk costs when deciding on whether to exit their setting.

To address the selection and treatment lock-in effect, we use a Mincer (1958) equation approach in which first, we estimate the earnings of those individuals who made the transition to a new job in paid employment after 2003 to investigate whether a potential loss of labor market attractiveness is reflected in lower wages for entrepreneurs compared to matched employees. Second, based on predicted wages we construct proxies for the lock-in mechanism and include this measure in the logit models reported in Table 4.

The dependent variable in the Mincer equation is the logarithm of individuals' earnings in the

year of transition to a new job in paid employment using only observations of transitions to a new job. We use the standard Mincer equation explanatory variables: Years of wage experience, its squared term, and Years of schooling. In addition, we include our main explanatory variable, *entrepreneur*, to see whether an experience in entrepreneurship results in a reduction in pay. We add controls for female, year, and industry, and a dummy for whether the new job is in the *same industry* as the one to which the individual was affiliated in 2003, at the 2-digit level. *Same industry* captures whether job changes (included those from entrepreneurship to wage work) within the same industry are penalized less or not at all (Kaiser and Malchow-Møller, 2011, Neal, 1995). Finally, we add interaction terms between the entrepreneur and year dummies to check whether a longer time in entrepreneurship further decreases the attractiveness of wage employment. While imperfect, this provide some indication as to whether it is likely to be selection lock-in effects or treatment lock-in effects that play a role in the main equation.

*** INSERT TABLE 5 ABOUT HERE ***

Table 5 reports the results of the Mincer equation regression. Entrepreneurs that go back to wage work earn significantly less than wage earners that switch to a new job. This penalty is suggestive of a potential lock-in effect: some individuals might continue in entrepreneurship rather than receiving a pay cut for returning to the wage sector, suggesting a selection effect. This effect seems to be independent of time in entrepreneurship since the interaction terms are insignificant which may indicate the treatment effect either to be instantaneous and not dynamic, or not to be of a significant magnitude. Results of the standard covariates are significant and in the direction of Mincer's model. Within industry moves (*same industry*) do not seem to be

penalized to the same degree. Females seem to earn less than males.

Utilizing the coefficients of the Mincer regression, we calculate the predicted wage of all individuals in our sample including those that do not move. The predicted wage represents the wage an individual is expected to earn for a move into (a new) wage employment based on the observables in the Mincer specification. We consider two variables for the lock-in effect of selection and treatment designed to capture the individual's wage related decision in terms of job change. First, we estimate the difference between the predicted wage and the actual wage, *predicted wage premium*, which expresses whether an individual would take a pay cut or get a pay rise as a result of the choice to move into a new wage worker setting. A positive estimate for this would suggest that pay premiums encourage mover behavior. However, since the estimate for entrepreneurs is significantly negative in the Mincer equation, this provides evidence of a lock-in effect for entrepreneurs compared to wage earners. Second, we use raw *Predicted wage* since it is informative about the problem related to finding a new affiliation. A significant negative estimate suggests that even if the individual achieves a high wage in employment, s/he still finds it difficult to exit suggesting lock-in.

Table 4 columns 2, 3 and 4 in report the results from the logit model for transition to a new job, introducing the correction terms for selection and treatment lock-in effect stepwise. Column 2 includes the *Predicted wage premium*, Column 3 includes the predicted wage, and Column 4 includes both terms. The estimate of *Predicted wage premium* is positive suggesting that a pay-cut would entail a lower likelihood of moving into a new work-context. The negative estimate for predicted wage suggests that even if the individual can expect a high salary in the new setting, he/she will not move to a new wage work setting. Both results suggest lock in to the current setting due to either selection or treatment effects. Given the results of the Mincer

equation where the estimate for entrepreneurship is negative, we interpret the findings to indicate that entrepreneurship promotes a lock-in effect. Also, the interactions between entrepreneur and year fixed effects in the Mincer equation are not significant which may be a weak indication in favor of the selection compared to the treatment effect.

To control for investment lock-in, we used a sub-sample of the observations. We identify a subsample of industries, namely consultancies, where the sunk costs are relatively small or even non-existent so that investment lock-in effect do not play a role. The results of the duration model specification are displayed in Table 4 column 5. Even for this subsample of observation we find that the coefficient of entrepreneur is significant and negative. When we hold the investment lock-in effect fixed we find support for the main proposition that entrepreneurship acts as a treatment that lowers job-hopping tendencies among high employment turnover individuals.

The results for the control variables show broad support for the findings in the literature on the determinants of employment turnover. Model 4 suggests that individuals who have been in more jobs in the past are more likely to move again, as indicated by the significant positive estimates associated with number of firms and number of industries. Individuals with more years of wage experience are less likely to change jobs, suggesting that longer experience is associated with a higher likelihood of being in a in a position characterized by high quality match – the longer the individual has been active in the labor market the more likely a high quality match will have been achieved (Topel and Ward, 1992). Finally, the results suggest that individuals working for large companies, and necessity movers, make another move sooner. This last observation may suggest that necessity movers are more likely to choose a lower quality fit in the immediate subsequent professional affiliation because they were forced to find a new job compared to movers who move for other reasons. We find also that females tend to exhibit lower tendencies to change jobs.

3.4.3 Robustness Checks and Additional Analysis

Although our matching procedure eliminates a large set of observable differences between entrepreneurs and employees, it is still possible that individuals select into the treatment based on *unobservables*. To address this concern, we select a subsample of necessity movers (entrepreneurs and matched employees), i.e. individuals from companies that exited the market in 2003 (lay-offs). The intuition is that since these individuals were forced to change jobs, the endogeneity related to the job decision is at least partially attenuated. The results for this restricted subsample are presented in Table 4 column 6. Although these results are weaker, we find a negative sign of the entrepreneur dummy, which confirms the robustness of our finding.

In a supplementary analysis, we consider an alternative dependent variable. Table 6 presents the results of a multinomial logit on the likelihood of transitioning to a new job in wage work (1), to a new job in entrepreneurship (2), or of staying in current employment (baseline). The aim is to show that the results hold only with respect to the transition to wage work and not the transition to entrepreneurship, where job-match and lock-in effects are substantially smaller or completely absent. We find that entrepreneurs are less likely to move to wage work compared to continuing in the current job, while the choice between creating another firm (serial entrepreneurship) and remaining in the founded firm is not statistically significant. Finally, an unreported test shows that entrepreneurs are significantly more likely to create new firms than return to wage work compared to matched employees, suggesting that they develop a preference for entrepreneurship. We also find support for the selection and treatment lock-in effect as in the standard duration specification. We consider this strong evidence that entrepreneurship reduces high employment turnover tendencies.

3.5 Conclusions

This study considered whether transition to entrepreneurship lowers individuals' employment turnover tendencies. Our theoretical model identified two mechanisms behind this relation: job matching and lock-in separating the latter between selection and treatment effects and effects related to sunk cost investments. The empirical inquiry reveals that entrepreneurs persist longer in their employment status than comparable individuals in the wage sector. This is an unexpected result since entrepreneurship often is viewed as an unstable and risky career choice, characterized by high exit rates (Taylor, 1999) and income volatility (Evans and Leighton, 1989). Moreover, greater employment stability is partly attributable to high quality matches among high employment turnover individuals in entrepreneurship. These results are robust to controlling for unobserved heterogeneity related to the initial decision to change job, and to potential lock-in effects created by selection and treatment effect on potential wage earnings and industry-specific effects in the form of exit barriers/sunk costs.

The findings have important implications for the study of entrepreneurship. First, this research adds to understanding of the rewards available to entrepreneurs, and in turn, to the so-called entrepreneurship puzzle, i.e. why do individuals become entrepreneurs if the risk-return hypothesis is not supported (see e.g. Åstebro and Chen, 2014, Campbell, Ganco, Franco and Agarwal, 2012, Hyytinen, Ilmakunnas and Toivanen, 2013). Job stability is an important and desirable labor market outcome for the individual, and can be attributed at least in part to high quality matching, i.e. where the individual's wage and productivity standards are relatively high.

Second, there is substantial empirical evidence that individuals with more varied job histories

are more likely to become entrepreneurs (Elfenbein, Hamilton and Zenger, 2010). Our study adds to this by suggesting that this is not an innate quality among such individuals but in fact can be treated with specific work contexts, which precipitates a higher quality match than they would have found in wage-work settings.

Third, our results are also informative for policy and suggest that policy makers should redirect the resources spent on unemployment benefit to incentives for entrepreneurship. This would be particularly beneficial for workers who exhibit systematic problems with authority or earn significantly less than their level of education and work experience might predict. Indeed, high employment turnover individuals often experience spells of unemployment and are responsible for most of the costs and social losses associated with job turnover. Directing them towards entrepreneurial activity could have substantial positive effects for society and government budgets.

Fourth, our findings have implication for managers. Employees with varied job histories are likely to possess entrepreneurial abilities relevant to firms' innovation strategies, and might introduce novel features in the organization. Managers should consider devoting attention to securing the commitment of these individuals. Beyond financial incentives, managerial efforts could be directed towards creating an environment that supports autonomy and increases workers' responsibility for the outcomes of their activities. This is in line with work on organizational structure and entrepreneurial spawning (see e.g. Özcan and Reichstein, 2009).

These findings and the limitations of our study indicate directions for further research at the nexus of entrepreneurship and labor mobility. First, more empirical work could be done to further disentangle the mechanisms considered. We separated job-matching mechanisms from lock-in effects, and took steps to segregated selection and treatment lock-in from investment

related lock-in, using an empirical strategy based on a Mincer approach and split sample investigations. Future research could separate job matching and job satisfaction. Unraveling these two mechanisms could provide valuable information for policy makers about the design of institutions and incentives to encourage entrepreneurial activity. This was impossible in the present study due to data limitations and the non-mutual exclusiveness of the mechanisms. However, since job matching relates to worker's skills related to entrepreneurism, and job satisfaction relates to worker's preferences for autonomy, disentangling the two might provide a deeper understanding of the effects that cause high employment turnover entrepreneurs to continue for longer in their entrepreneurial ventures than comparable wageworkers remain in their jobs.

Second, in contrast to prior research on the returns to entrepreneurship, which focuses almost exclusively on income as a labor market outcome variable, we considered a fundamental outcome of labor economics studies, i.e. job stability. Future research could investigate the relation between job stability and start-up performance. The findings might have implications for the finding in many studies that lower earnings are associated with entrepreneurship (e.g. Hamilton, 2000), providing evidence either for or against.

Third, although our matching procedure successfully eliminated differences in observable attributes between the treatment and the control groups, it is possible that systematic unobservable factors may determine a worker's assignment to the treatment or control group. The stability effect will be overestimated if unobservable factors are positively correlated with the likelihood of being an entrepreneur and negatively associated with employment turnover. We tried to minimize this possibility by focusing on workers that experienced lay-offs where job change job is not an active choice. Nevertheless, the analysis in this paper could be seen as a quasi-experiment, which limits the degree to which we can attribute causality to the effect. There may be unobserved variations that affect the estimates we report. A clean experimental setup would provide evidence to rule out more strongly any unobserved elements than was possible with the data used for the present study.

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Tables

Table 1. Mean Comparison of Entrepreneurs and Non-Entrepreneur across Variables

			Movers			Sta	Stayers	
Variables	Entrepreneurs	Matched wage workers	Test for difference (1) vs (2)	All movers	Test for difference (1) vs (4)	All stayers	Test for difference (1) vs (6)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Number of firms	1.754	1.712	n.s.	1.967	***	1.463	***	
Number of industries	1.291	1.260	n.s.	1.338	***	1.168	***	
Entrepreneurial parent	0.056	0.052	n.s.	0.038	***	0.023	***	
Married	0.579	0.605	n.s.	0.490	***	0.609	***	
Female	0.225	0.225	n.s.	0.446	***	0.475	***	
Children	0.584	0.590	n.s.	0.466	***	0.471	***	
Bachelor	0.071	0.072	n.s.	0.074	n.s.	0.074	n.s.	
Age	37.990	38.082	n.s.	35.388	***	41.631	***	
Wage experience	14.735	15.089	n.s.	13.354	***	16.493	***	
Wage earnings	335,608	342,788	n.s.	236,255	***	261,673	n.s.	
Employer size	2,139	2,260	n.s.	6,792	***	5,935	***	
Necessity mover	0.823	0.814	n.s.	0.778	***	-	-	
N. of observations	1,257	1,257		225,343		1,162,839		

*** p<0.001, n.s. denotes non-significant statistical differences.

Variables	Transition to
	Entrepreneurship
Number of firms	0.0227
Number of firms	(0.0227
N 1 6:1 4:	(0.036)
Number of industries	0.0619
	(0.057)
Entrepreneurial parent	0.0254
	(0.113)
Married	-0.0245
	(0.060)
Female	-0.0372
	(0.071)
Children	-0.0440
	(0.057)
Bachelor	(0.092)
	(0.171)
Wage experience	-0.0015
	(0.003)
Wage earnings	(0.000)
	0.000
Employer size	-0.000
	(0.000)
Necessity mover	0.0322
-	(0.067)
Constant	-0.067
	(0.371)
Industry dummies	Yes
N of observations	2 514
Pseudo R-squared	0.010
Log likelihood	-1 742 571
Wald chi2(48)	35.47
Prob > chi scupred	0.909
Number of industries Entrepreneurial parent Married Female Children Bachelor Wage experience Wage earnings Employer size Necessity mover Constant Industry dummies N. of observations Pseudo R-squared Log likelihood Wald chi2(48) Prob > chi-squared	0.0619 (0.057) 0.0254 (0.113) -0.0245 (0.060) -0.0372 (0.071) -0.0440 (0.057) (0.092) (0.171) -0.0015 (0.003) (0.000) 0.000 -0.000 (0.000) 0.0322 (0.067) -0.067 (0.371) Yes 2,514 0.010 -1,742.571 35,47 0.909

Table 2. Probit Regression on Matching Model

Note. The model predicts the likelihood of being in the treatment group (entrepreneurs) rather than in the control group (matched wage workers) in 2003. Robust standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1.

I able 3. Correla	LION MA			Iary Staus	lics												
		Mean	S.D.	Max	Ξ	5	3	(4)	(2)) و	6	8)	() (1	_ _	11)	12)	(13)
(1) Transition to iob	a new	0.177	0.382	1													
(2) Entrepreneur		0.5	0.5	1	-0.169	1											
(3) Number of fi	suu	1.733	0.801	4	0.071	0.022	1										
(4) Number of ir	ndustries	1.275	0.506	4	0.066	0.026	0.456	-									
(5) Entrepreneur	ial	0.054	0.227	1	0.003	0.002	0.052 (0.036	-								
(6) Married		0.592	0.492	-	-0.027	-0.047 -	-0.076 -	0.043 -	0.098	-							
(7) Female		0.225	0.418	-	-0.001	- 600.0-	-0.031 -	0.051 (0.021 0	.001	-						
(8) Children		0.603	0.489	-	-0.007	-0.037 -	-0.031 (- 100.0	0.034 0	.349 0.	004	_					
(9) Bachelor		0.071	0.257	-	0.004	-0.009	0.032 (0.027 -	0.016 0	.040 -0	012 0.0	012	_				
(10) Wage experi- (standardized valu	ence ^{le)}	0.459	0.868	2.778	-0.113	-0.045 -	-0.139 -	0.107-	0.131 0	.321 -0	.121-0.	010-0.	077	_			
(11) Wage experi- (standardized value)	ence, sq. ^{ne)}	0.964	1.356	7.719	-0.070	-0.067 -	-0.109 -	0.095-1	0.073 0	.216 -0	.107 -0.	180 -0.	038 0.8	814	-		
(12) Wage earnings/10.0	00(33.92	22.403	319.676	-0.037	-0.053 -	-0.042	0.014-	0.054 0	.175 -0	236 0.0	0.2	239 0.2	209 0.	.132	-	
(13) Employer siz	ce/1,000	2.199	5.608	43.203	0.084	-0.031	0.193 (0.075 -1	0.001-0	.004 0.	073 -0.	050 0.()50 -0.(064 0.	.020 -0	0.027	-
(14) Necessity mo	over	0.818	0.386	-	0.063	0.050	0.104 (- 090.0	0.001 -(0.021-0	031 0.0	0- 44	035-0.(0-760	.110-0	0.075.0	.091
Mote All coefficients	above 0.07	1 in allen	lute term a	ra cimificant	at the 50% 1	lave											Ì

Variables		Full S	ample		Investme nt lock-in	Necessity
					effect	subsample
	(1)	(2)	(3)	(4)	(5)	(6)
	0.004***	0.02(***	0.007***	0.07(***	0.112*	0.020
Entrepreneur	-0.084***	-0.036***	-0.095***	-0.0/6***	-0.113*	-0.030+
Selection and treatmen	(0.011) t lock in affact	(0.008)	(0.013)	(0.013)	(0.050)	(0.017)
Deadlists 4 more a more in	і іоск-іп едјесі	3. 0.026***		0.022***	0.020	0.012
Predicted wage premiu	m	(0.026		(0.022***	0.039+	0.012
Des d'ate dans a		(0.008)	0.027*	(0.003)	(0.023)	(0.012)
Predicted wage			-0.03 /*	-0.088***	-0.21/*	-0.116***
Number of firms	0.000*	0.011	(0.017)	(0.022)	(0.085)	(0.041)
Number of firms	0.008*	0.011+	0.007*	0.008+	0.024	0.008
March and Charlestonian	(0.004)	(0.006)	(0.004)	(0.005)	(0.020)	(0.011)
Number of industries	0.018**	0.020*	0.01/**	0.01/*	0.016	0.064*
F ((0.006)	(0.009)	(0.006)	(0.007)	(0.024)	(0.029)
Entrepren. parent	-0.012	-0.022	-0.011	-0.018	0.070	0.019
NC 1 1	(0.011)	(0.016)	(0.010)	(0.012)	(0.076)	(0.036)
Married	0.007	0.007	0.007	0.007	0.002	0.003
	(0.006)	(0.010)	(0.006)	(0.008)	(0.031)	(0.020)
Female	-0.010	0.007	-0.026*	-0.034*	-0.120*	-0.015
~ ~ ~ ~	(0.008)	(0.011)	(0.011)	(0.013)	(0.053)	(0.024)
Children	-0.005	-0.013	-0.005	-0.011	0.038	-0.034
	(0.006)	(0.010)	(0.006)	(0.008)	(0.033)	(0.024)
Bachelor	-0.005	-0.042*	0.010	0.000	0.010	0.014
	(0.011)	(0.018)	(0.012)	(0.016)	(0.052)	(0.030)
Wage experience	-0.035***	-0.046***	-0.024**	-0.019*	-0.044	0.001
	(0.007)	(0.009)	(0.007)	(0.009)	(0.039)	(0.010)
Wage experience, sq.	0.003	0.004	-0.001	-0.006	0.003	-0.014
	(0.004)	(0.005)	(0.004)	(0.005)	(0.020)	(0.009)
Wage earnings	-0.000	-0.000	-0.000	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Employer size	0.002***	0.003***	0.002***	0.003***	0.016*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.002)
Necessity mover	0.033***	0.055***	0.029***	0.041***	0.064 +	-
	(0.007)	(0.010)	(0.006)	(0.009)	(0.033)	-
Constant	-1.695***	-2.009***	3.945	9.432**	15.668*	-0.505
	(0.351)	(0.377)	(2.886)	(3.119)	(7.325)	(1.473)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
N. of observations	8,504	5,630	8,504	5,630	1,025	1,347
Pseudo R-squared	0.067	0.049	0.067	0.051	0.088	0.047
Chi-squared	482.829	270.939	489.14	285.069	84.615	57.559
Log likelihood	-3,706.723	-2,859.026	-3,704.795	-2,852.334	-502.125	-549.326

Table 4. Logit Regression on Transition to a New Job. Marginal Effects Reported.

Note. Model 6 omits necessity mover because by sample construction it takes the value zero for all observations. Robust standard errors are in parentheses. *** p<0.01, ** p<0.01, * p<0.05, + p<0.1.

Table 5. The Mincer Wage Regression

Variables	Wage (log)
Present Study-Specific Covariates:	
Entrepreneur	-0.740***
	(0.124)
Entrepreneur*Year dummy (2005)b	0.256+
	(0.143)
Entrepreneur*Year dummy (2006)b	0.278 +
	(0.150)
Entrepreneur*Year dummy (2007) ^b	0.112
	(0.162)
Entrepreneur*Year dummy (2008) ^b	0.177
	(0.176)
Female	-0.468***
	(0.049)
Same industry	0.127**
	(0.040)
Standard Mincer Covariates:	
Years of schooling ^a	0.230**
	(0.082)
Wage experience	0.206***
	(0.035)
Wage experience, sq.	-0.099***
	(0.022)
Constant	12.329***
	(0.175)
Industry dummies	Yes
Year dummies	Yes
N. of observations	1,402
R-squared	0.303
F (27, 1374)	24.58

Notes. Number of observations corresponds to individuals (both entrepreneurs and matched wage workers) who transition to a new job in wage work after 2003. Robust standard errors are in parentheses.

^a Years of schooling is a count variable which categorizes the level of education based on number of years of schooling. It takes the values: 10, 12, 14, 16, 18, and 20. It replaces *bachelor* in order to follow the standard Mincer's model specification. ^b Compared against the omitted category *Entrepreneur*Year dummy (2004)*.

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1.

Variables	Transition to wage	Transition to
	employment	entrepreneurship
	(1)	(2)
Entrepreneur	-0.074***	-0.001
	(0.013)	(0.002)
Selection and treatment		()
lock-in effects:		
Predicted wage premium	0.020***	0.001
	(0.005)	(0.001)
Predicted wage	-0.079***	-0.005
	(0.021)	(0.004)
Number of firms	0.008 +	0.000
	(0.005)	(0.001)
Number of industries	0.018*	-0.000
	(0.007)	(0.001)
Entrepreneurial parent	-0.016	-0.001
	(0.012)	(0.002)
Married	0.006	0.000
	(0.007)	(0.001)
Female	-0.028*	-0.004
	(0.013)	(0.003)
Children	-0.011	0.000
	(0.008)	(0.001)
Bachelor	0.000	-0.000
	(0.016)	(0.002)
Wage experience	-0.019*	-0.000
	(0.009)	(0.001)
Wage experience, sq.	-0.003	-0.003
	(0.005)	(0.002)
Wage earnings	-0.000	0.000
	(0.000)	(0.000)
Employer size	0.003***	-0.000
	(0.001)	(0.000)
Necessity mover	0.041***	0.000
	(0.009)	(0.001)
Constant	8.799**	8.799**
	(3.197)	(3.197)
Industry dummies	Y	es
Year dummies	Y	es
N. of observations	5,6	30
Pseudo R-squared	0.0	57
Chi-squared	4,655	5.624***
Log likelihood	-3,09	1.590

Table 6. Multinomial Logistic Regression on Transition to a New Job. Marginal Effects Reported.

Robust standard errors are in parentheses. *** p<0.001, ** p<0.01, * p<0.05, + p<0.1.





Figure 1. Kaplan-Meier Survival estimates

Note. The log-rank test for equality of survivor functions takes a value of 213.11 (p < 0.001).

4 Effects of tournament on entrepreneurship at different firm sizes - contextual and preference sorting

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Abstract

Extant literature established that a variety of workplace characteristics have an impact on the likelihood of employees making the transition to entrepreneurship. We focus on the tournament taking place within the firm and consider pay dispersion as a proxy for the structure of incentives within existing organizations. In the setting of a tournament, workers aim at achieving the next rank and the incentives to exert the necessary effort depend on the absolute spread between the payoffs for each rank. Moreover, workers self-select in firms, and firm size is the main observable organizational dimension along which this process occurs. By leveraging the well documented inverse relationship between firm size and the likelihood of transition to entrepreneurship, we investigate the interplay between selection and tournament and in particular how tournament-based organizational structures shape the individuals' incentives to transition to entrepreneurship. By using a unique matched employer-employee dataset from Danish register data we focus on 92,099 newly hired employees in 2003. With discrete time duration models we cover the employees' episodes of turnover in the years 2004 to 2008. Results confirm that firm size is a central element in the dynamics connecting tournament and the transition to entrepreneurship. In particular, we find support for our claim that small firms' employees are less likely to leave their employer to become entrepreneurs when the tournament relative to the competitors is high.

4.1 Introduction

Firms differ in the way they organize and operate. Consequently, the work context of individuals differs across firms. Work context has been shown to be an important factor contributing to the entrepreneurial tendencies of the individual. A variety of workplace characteristics have an impact on the likelihood of employees making the transition to entrepreneurship: the level of bureaucratization (Ozcan and Reichstein, 2009, Sørensen, 2007, Tåg et al., 2013), the peers and the social capital embedded (Nanda and Sørensen, 2010), and complementary assets (Campbell et al., 2012; see Sørensen and Fassiotto, 2011 for a more sistematic review of this emerging literature).

A few recent studies have focused on the structure of incentives within firms and its effects on entrepreneurship. These scholars have used pay dispersion as a proxy for the structure of incentives within the firm. Internal career opportunity structure (measured by pay dispersion) has a noticeable effect on entrepreneurship. When the odds of obtaining a promotion are low, i.e. the tournament and the pay dispersion are higher, the probability of transitioning to entrepreneurship is higher (Carnahan et al., 2012, Sørensen and Sharkey, 2014). Previous work also indicates that optimal pay dispersion varies as a function of investment opportunities and environmental decisions (Bloom and Michel, 2002), which in turn may contribute to the decision to transition to entrepreneurship.

This paper contributes to this stream of research by considering tournament and its association with the individual's likelihood of transitioning to entrepreneurship. Tournament is a reward system based on rank-ordered performance rather than absolute performance, which is particularly desirable in cases where monitoring is costly or unreliable (Lazear and Rosen, 1981). In the setting of a tournament, workers aim at achieving the next rank and the incentives to exert

the necessary effort depend on the absolute spread between the payoffs for each rank (Becker and Huselid, 1992, Rosen, 1986). This payoff dispersion (i.e. the salary structure) therefore directly impacts on workers' incentives. It has a number of other implications for various aspects of the employees' behavior, such as the decision to change jobs or to transition to entrepreneurship (Bloom and Michel, 2002, Carnahan, Agarwal and Campbell, 2012, Sørensen and Sharkey, 2014).

We offer further insights into the association between tournament and entrepreneurial entry by considering that workers self-select in firms, and firm size is the main observable organizational dimension along which this process occurs. An inverse relationship between firm size and the likelihood of transition to entrepreneurship is well documented (Parker, 2009, Sørensen, 2007). Elfenbein et al. (2010) labeled it as the "small firm effect" and showed that selection based on preferences and selection based on abilities represent the two main underlying explanations. Furthermore, small firms' workers are more likely to quit their job and, conditional on leaving, to found their own firm (Elfenbein et al., 2010, Gompers et al., 2005, Lazear and Shaw, 2008, Sørensen and Phillips, 2011, Tåg, Åstebro and Thompson, 2013). We investigate the interplay between selection and tournament with the aim of providing a more compelling analysis of how tournament-based organizational structures shape the individuals' incentives to transition to entrepreneurship.

We propose that the response of individuals to the tournament relative to the competitors (proxied by a firms' pay dispersion relative to their competitors) depends on firm size. In particular, since small firms' workers are more likely to value autonomy and pay-perperformance (Nickerson and Zenger, 2008, Zenger, 1994) we posit that their response to high tournament will lower the probability of leaving their current employer to enter entrepreneurship, while workers of larger firms will exhibit a higher likelihood of transitioning to entrepreneurship.

By using a unique matched employer-employee dataset from Danish register data we focus on 92,099 newly hired employees in 2003. The analysis performed consists of discrete time duration models and covers the employees' episodes of turnover in the years 2004 to 2008. The results confirm the fact that firm size is a central element in the dynamics connecting tournament and the transition to entrepreneurship. In particular, we find support for our claim that small firms' employees are less likely to leave their employer to become entrepreneurs when the tournament relative to the competitors is high. In other words, entrepreneurial individuals who have a dispositional preference for a setting that tightly couples pay and performance will not leave to found a new firm if their setting is aligned to their preferences.

The remainder of the paper is as follows: part 2 develops the theoretical framework, part 3 describes the data and method, part 4 presents the results, part 5 contains a supplementary analysis, and part 6 concludes.

4.2. Theoretical framework

One of the most common tool employers use to create incentives and thus lower monitoring costs is paying and promoting employees on the basis of relative performance rather than marginal product. This practice creates competition between employees and the firm becomes the context of a tournament. Tournament theory (Lazear and Rosen, 1981) models promotion as a relative game, in which grants are the reward for employees whose performance exceeds that of their peers (Lazear and Shaw, 2007). Substantial experimental evidence supports this theory by showing that this compensation scheme provides strong incentives to outperform (Delfgaauw et al., 2013, Nalbantian and Schotter, 1997, Orrison et al., 2004).

The tournament within a firm generated by relative performance pay systems may also have unintended consequences that are costly for the employer (Barron and Gjerde, 1997, Lazear, 1989). For example, the feedback on performance may induce peers to engage in unethical activities to increase the chances of promotion (Carpenter et al., 2010, Charness et al., 2013, Harbring and Irlenbusch, 2011). Tournament can also affect employees' turnover. Studies of social comparison processes suggest that individuals respond to perceptions of inequitable pay with the decision to leave the job (Larkin et al., 2012, Zenger, 1992). Also, it is of major importance for established firms if the turnover triggered by career tournament dynamics includes entrepreneurial workers. Such individuals are acknowledged to be important drivers of change and innovation within firms (Freeman, 1986). If this is the case, a trade-off emerges between incentives plans and retention policies.

There are good reasons to believe, however, that the entrepreneurial worker will thrive with tournament structures compared to non-entrepreneurial workers. Entrepreneurial individuals tend to favor settings in which there is a close relation between pay and performance (Elfenbein et al., 2010). Organizing a firm using a tournament based incentive scheme may be a means to retain the entrepreneurial individuals since it attracts them in the sense that they portray preferences for such work settings. Since entrepreneurial individuals have been characterized as exhibiting above average employment turnover tendencies (Astebro and Thompson, 2011); this organizational feature may represent a substantial and powerful tool to retain these particular skills and traits in the organization.

Entrepreneurial individuals have also been shown to be more likely to select into small firms and to base this selection on preferences and ability (Elfenbein et al., 2010). Individuals with a more varied skill set are better suited to work in a smaller firm, since in small firms jobs are more diversified and less routinary compared to larger organizations. Furthermore, small firms offer a work context where the individual has more freedom to operate and less likely to be subjected to the decisions of authorities. Entrepreneurial individuals are hence more likely to select into small firms than larger organizations, and we will therefore be more likely to observe the entrepreneurial preferences in small firms as opposed to larger organizations.

As the selection is based on preferences and skills, we posit that the effect of tournament incentive schemes in organizations with respect to triggering employees to transition to entrepreneurship will differ between small firms compared to large firms. We conjecture that tournament triggers entrepreneurship differently in smaller firms. As illustrated by Elfenbein et al. (2010), workers select into small firms on the basis of individual attributes and the effects of tournament in small firms vary according to these selection processes. Individuals are more likely to choose to work in small firms based on their preferences for pay-per-performance: smaller employers adopt performance-contingent pay structures (Zenger, 1994) because they are more likely to have lower measurement costs or higher efforts to differentially reward performance (Nickerson and Zenger, 2008). If small firms implement a weak tournament relative to competitors with a relatively flat remuneration structure, individuals are more likely to leave this setting in order to find an environment that better suits their preferences. They are hence more likely to enter entrepreneurship where individual performance is even more directly linked to pay.

In larger firms with higher tournament relative to the competitors, entrepreneurial workers experience a disadvantage compared to specialists and might be less likely to win the tournament. Following Elfenbein et al. (2010), employees in larger firms do not seek a tight link pay-performance, and respond to increases in the tournament with the perception of a lower likelihood to obtain the promotion. Arguably they are incentivized to enter entrepreneurship where they avoid the competition for the promotion, and their skills are less mismatched. On the contrary, in small firms the entrepreneurial individuals are less likely to experience a mismatch. If it is true that demonstrated ability is more likely to be correlated to ability in a small firm than in a larger firm (Elfenbein, Hamilton and Zenger, 2010, Jovanovic, 1979), the more entrepreneurial individuals are more likely to win the tournament in smaller firms than in larger ones, which would result in a decreasing rate of entrepreneurship out of smaller firms with higher tournament relative to competitors.

These proposed relations extend previous work documenting a positive association between tournament as proxied by pay dispersion and entry to entrepreneurship. While Sørensen and Sharkey (2014) focus on a measure at the firm level disregarding competitors, Carnahan et al. (2012) are focused on the extreme performers and introduce a measure for wage dispersion relative to a firms' competitors. This measure is particularly important since employees commonly refer to individuals outside the organization to determine pay satisfaction (Brown, 2001, Hills, 1980, Law and Wong, 1998, Trevor and Wazeter, 2006). Furthermore, competitors' characteristics are an important reference point to develop programs aimed at attracting employees in the arena of inter-firm competitions for talent (Cappelli, 2000, Gardner, 2005), especially in labor markets that are increasingly fluid (Topel and Ward, 1988). Although highly valuable, these contributions provide little appreciation for the role of selection of more entrepreneurial individuals inside the firm. This selection at entry in existing organizations represents one of the dynamics that Sørensen and Fassiotto (2011) point as underinvestigated. We address their call and extend the emerging literature on pay dispersion and entrepreneurship by indicating that the documented effects may be contextual, and operate through selection mechanisms.

4.3 Data and method

4.3.1 Data and Sample construction.

We draw on the IDA database ("Integreret Database for Arbejdsmarketforskning") which is a matched employer-employee dataset covering the entire Danish labor market. The dataset is assembled and maintained by Statistics Denmark for the purpose of research and making informed policy recommendations. The dataset is longitudinal since it tracks the movements of individuals yearly across organizations. It has been utilized in numerous prior investigations on labor market dynamics (e.g. Dahl and Reichstein, 2007, Frederiksen, 2008, Kaiser and Malchow-Moller, 2011) and has proven useful for the purpose of investigating entrepreneurial venturing in particular (Dahl and Sorenson, 2012, Nanda and Sørensen, 2010, Sørensen, 2007). With this data, we track individuals' career movements, labor market movements, their characteristics, and the firms with which they are affiliated, and hence the firm-employee relationships over time.

The Danish labor market is characterized by a model of "flexicurity", which means that it is comparable to the US labor market in terms of flexibility (Sørensen, 2007). In addition, it is characterized by a high level of social support, which mitigates concerns about the potential effect of the phenomenon of necessity entrepreneurship on the analyses. We draw on data from 1998 until 2008. However, we utilize the data from 1998 to 2002 as a foundation for prior labor market activities of the individuals providing measures with regard to their affiliations and career movements. We accordingly have a window of six years for the duration analysis (2003-2008) to investigate hazards of transition to entrepreneurship given individual and contextual characteristics. The initial sample consists of individuals employed in the year 2002 with information about their past employment history in the years 1998 to 2002. The total number of wage employees in 2003 for which it is possible to track firm-affiliation in the previous five years (1998 to 2002) amounts to 1,342,855, with 18,589 first transitions to entrepreneurship and 831,046 movements to wage employment by 2008.

We couple the IDA data with the official register on newly founded firms, which contains information on all newly registered firms in Denmark and an identifier for the founder. This register provides a link between firm identifiers and founder identifiers that is identical to the identifiers present in the labor market data and business register data. These data are used to identify entrepreneurs.

In order to attenuate potential left censoring bias, we follow the literature in only capturing first transitions to entrepreneurship and exclude serial entrepreneurs (defined as individuals who started a new firm between 1998 and 2002). Serial entrepreneurs may exhibit significantly different labor market movements than other individuals (Baron and Ensley, 2006, Hyytinen and Ilmakunnas, 2007). Furthermore, in order to discard individuals unlikely to be wage employees but rather business owners as of 2002, two groups of individuals are further excluded from the sample, namely workers whose occupation code supplied by Statistics Denmark corresponds to "self-employed" and workers affiliated to a firm with one employee in 2002. Moreover, industries such as the primary sector (agriculture, extractive industries, and

electricity and water services) are excluded, as well as the public sector, because entrepreneurial activities follow particular dynamics in these sectors (see for instance Ozcan and Reichstein, 2009). For this these reasons, the sample size drops to 640,511 individuals, with 12,677 transitions to entrepreneurship and 317,160 moves to new wage employment over the observation time interval.

Finally, we strictly focus on individuals that were newly hired in 2002 to ensure that individuals are homogeneously followed from the point in time in which they are first at risk of leaving their parent firm. We thereby assume that no individual is at risk of leaving a job before they in fact have started working in the new position. This may be a strong assumption since some individuals may choose to venture into a job only temporarily. However, we believe this to be the exception rather than the rule and hence only a source of limited bias at worst. The final sample consists of workers newly hired in the year 2002 who exhibit the same onset of risk to transition to self-employment. The final number of individuals amounts to 92,099 (with 59,745 transitions to a new employer and 1,806 transitions to entrepreneurship).

4.3.2 Variables

Dependent Variable

The dependent variable accounts for first-time transitions to self-employment. It takes the value 1 if the first movement out of the parent firm is for an individual identified through the new business register as the founder of a new firm in the years 2003 to 2008. Entrepreneurship is hence defined as the establishment of a new firm. We also acknowledge that wage earners may have other outside options than entrepreneurship. For this reason, we also consider a dependent variable, which takes on four different values: 0 for staying in current wage employment (198,549 individual-years), 1 for moving into entrepreneurship (1,806 individual-years), 2 for

moving into new wage employment (59,745 individual-years), and 3 other moves (14,644 individual-years). The last transition (i.e. dependent variable equals 3) captures individuals who are not affiliated with a firm in that specific year. These are predominantly transitions to unemployment. Overall, alternative wage employment (i.e. dependent variable equal 2) is by far the dominant destination for movers out of an employment setting.

Independent Variables

Extant literature suggests that workers follow a sorting process (Elfenbein, Hamilton and Zenger, 2010). Accordingly, individuals working in different contexts have selected their occupation on the basis of unobserved characteristics, such as the preference for an entrepreneurial context. In order to operationalize the construct discussed previously, firms are organized in three size groups, following Elfenbein et al. (2010): *Small firms*, for firms with up to 25 employees, *Medium firms*, for firms with between 26 and 100 employees, and *Large firms*, for firms with more than 100 employees. The structure of the Danish economy is mainly based on small and medium businesses, so although the group of *Large firms* includes a smaller number of firms, it also encompasses higher variation in terms of size compared to the other two groups. The distribution of firms in the three groups is summarized in table 3. Models report only estimations for the Small and Medium firms since Large firms is set as the baseline.

The firm's compensation dispersion relative to competitors is captured by the *Relative Gini* coefficient. This approach follows Bloom and Michael (2002) and Carnahan et al. (2012) who study the link between pay dispersion and turnover. The Gini coefficient can assume values included in the interval 0 and 1: absolute equality corresponds to a 0, while a Gini coefficient of 1 measures absolute inequality. It is calculated as follows:

$$G = \frac{2\sum_{i=1}^{n} i*Wage_i}{n\sum_{i=1}^{n}Wage_i} - \frac{n+1}{n}$$
(1)

where $wage_i$ is the wage for the *i*th individual ranked within the firm at position *i* on the basis of the wage earnings and *n* is the number of employees in the firm. This Gini coefficient is then divided by the average for firms active in the same industry, defined by the two-digit NACE code. This level of industry definition is optimal since a narrower distinction might result in capturing too few firms or even industries with a single firm. *Relative Gini* represents therefore the Gini coefficient for each firm relative to its competitors (Carnahan et al., 2012).

Controls

We tracked the job histories of the subjects backwards in time until 1998 and counted their number of different affiliations. *Number of firms* is hence the count of the various firm affiliations for each individual in the period covering 1998 to 2002. If the focal individual is employed in firm "A" in 1998, and then moves to firm "B" in 2000 and further to firm "C" in 2001, the variable will assume value 3. Therefore, this variable will assume a maximum of 5 (and since all the individuals are new hires in 2002, the minimum number of firms affiliations in the period 1998 to 2002 will be 2).

We control for whether the individual is female by drawing on the IDA data, which contains a gender variable. Prior contributions suggest a substantial gender bias in terms of transition into entrepreneurship (Koellinger et al., 2011, Langowitz and Minniti, 2007).

In addition, the following individual controls have been included in the analysis. *Married*, which takes value 1 if the civil status classification provided by Statistics Denmark relative to the focal individual is married as of 2002. *Children* is a dummy taking value 1 for individuals with at least one child in 2002. The education attainment for the subjects in the sample is measured by the dummy *Education*, which equals 1 for individuals who completed at least a bachelor program in 2002. Furthermore, *Wage experience* measures the experience in the

labor market for each of the subjects in the final sample. This variable accounts for labor market tenure and covers the whole period in which an individual has been in the labor force until 2002. It enters the estimation at standardized values. Similarly, *Wage experience squared* is the squared term of the wage experience variable, which accounts for a (potential) non-linear effect of labor market experience on the dependent variable. *Wage earnings* represents the wage earnings of each individual in 2002 (it is a value expressed in 2002 Danish Kroner). Lastly, *unemployment* is a dummy that describes whether individuals experience a spell of unemployment. It takes value 1 if the length of the registered unemployed period exceeds half of the year 2002 and 0 otherwise. Moreover, in order to capture industry trends, two-digit NACE codes industry dummies are included in the analysis (a total of 36 dummies), together with year dummies that account for year-specific trends.

4.3.3 Analysis

The analysis of the association between tournament structures and workers' tendency to transition to entrepreneurship poses an empirical challenge. When performing an analysis of the turnover of workers it is particularly important to include workers who present the same hazard of transitioning to a new job. In other words, the sample considered should consist of individuals at the same onset of risk of performing the transition. This condition is however not met if the analysis includes all the workers in a firm in a specific moment: workers' turnover rates are a function of the match that workers experience with their employer, which occurs over time (Jovanovic, 1979, Nagypal, 2007). By focusing on new hires we can eliminate from the results some – if not most – of the confounding effects of turnover, thereby observing what is truly closer to our proposed mechanisms. Although we do not have the benefit of random assignment

of workers in a firm or a natural experiment in our study, our identification strategy allows us to alleviate concerns of spurious correlation driving our results.

For the analysis, we use a duration specification to investigate the effect of career competition on entrepreneurial tendencies. We thereby predict the individuals' tendency to transition to entrepreneurship given the contextual setting. Given that such transitions might happen at any point in time during the year, and because the data capture this event on a yearly interval only, we adopt discrete time hazard models in order to be able to account for this feature of the data. One way to implement such discrete time hazard models would be through logistic regression. However, this model would present a notable drawback since it would make it impossible to distinguish between transition to entrepreneurship from the 2002 employment and subsequent transitions to entrepreneurship from other parent firms. In other words, it would be impossible to distinguish between the following two cases: 1) a transition to entrepreneurship directly out of the wage employment as of 2002; and 2) a transition to entrepreneurship subsequent to a move to different wage employment compared to 2002. This would make it problematic to capture the effect of the contextual effects since these indicate the setting to which the subject was affiliated in 2002. Instead, we use a multinomial logistic regression specification, which enables us to distinguish the first transitions from the parent firm at the beginning of the sample. The careful coding of the dependent variable makes a multinomial logistic model apt to account for the first of the transitions out of wage work in 2002: either to entrepreneurship (outcome 1) or to new wage employment (outcome 2), whereas the baseline model is stability in the same occupation. Accordingly, the estimations presented in the tables are the result of multinomial logistic models.

Since we are using a duration specification for the analysis, we also include year dummies. These capture the average variation in transition tendencies across years. They can be considered time fixed effects since all observed subjects are at risk at the same time – namely, 2002.

4.4 Results

4.4.1 Descriptive Statistics

Table 1 presents the summary statistics and the correlation matrix. Individuals in the sample have on average been in 2.64 different firms in the years 1998 to 2002. About 37% of the sample consists of females. Moreover, individuals in the sample have an average age of 38.3 years and have been in the labor market for about 16 years.⁴ Table 2 shows the same summary statistics by splitting the sample between individuals working in 2002 in the three groups of firms: small, medium and large.

*** INSERT TABLE 1 ABOUT HERE *** *** INSERT TABLE 2 ABOUT HERE ***

It can be noted that the proportion of entrepreneurs in the group of workers in small firms is higher compared to larger organizations; this fact aligns with the stylized fact that small firms spawn a larger number of entrepreneurs as shown in previous studies as a by-product of selection based on preferences and ability (e.g. Elfenbein et al., 2010). Moreover, a job history of high mobility occurs more frequently for individuals working in small firms, who are on average

⁴ Age is not present in the models and in the correlation table since it is highly collinear with wage experience (pairwise correlation coefficient of around 0.8). Summary statistics report the standardized value of wage experience.
affiliated with 2.68 firms in the pre-sampling period (1998-2002). This number decreases for employees in medium firms, who have 2.64 firm affiliations on average, and declines even more for employees in larger firms: 2.55. T-tests confirm that these differences are statistically significant at the 5% level. Another interesting comparison regards the average wage earnings of workers in small firms compared to those of larger firms. Individuals in medium and large firms have a higher salary on average relative to workers in small firms (unreported t-tests also suggest that these differences are statistically significant at 5%).

4.4.2 Regression Statistics

Table 4 reports the estimates of discrete time event history models estimated using multinomial logistic regression. Two model specifications are presented: the first in columns 1 to 3 and the second, including the interaction terms, in columns 3 to 6. The columns represent each of the predicted outcomes, derived from the structure of the dependent variable: transition to entrepreneurship (columns 1 and 4), transition to wage employment (columns 2 and 5), and other transitions (columns 3 and 6). For the two models the baseline outcome (which is omitted) is the persistence of individuals in the firm, i.e. no transition taking place. All the specifications include industry controls defined by two-digit NACE codes (which consist of 36 industry dummies), providing a fine-grained control for the various industry trends. The table also displays robust standard errors.

*** INSERT TABLE 4 ABOUT HERE ***

Column 1 of table 4 contains the estimates for the main term, *Relative Gini*, on the first outcome, i.e. transition to entrepreneurship. The effect of *Relative Gini* does not seem to

contribute to explaining the transition to entrepreneurship for new hires. Contrary to previous studies (that consider all employees and do not limit the analysis to new hires), the coefficient of -0.032 is not significant, with a standard error of 0.059. The effect of *Relative Gini*, however, contributes to the turnover of individuals to other wage employment (the coefficient is positive and significant at the 5% level in column 2).

Columns 3, 4, and 5 in table 4 include interaction terms between *Relative Gini* and the two other dummies *Small firm* and *Medium firm*. The coefficients for the interaction term between *Relative Gini* and the *Small firm* dummy are negative and statistically significant at 5%. This provides evidence suggesting that career tournament is associated with a lower hazard of transition to entrepreneurship. In other words, for the group of small firm workers, the higher the tournament taking place in the firm, the lower the likelihood of a transition to entrepreneurship: this evidence supports the notion that in highly entrepreneurial environments i.e. in small firms, higher tournament is desired by workers who have a preference for entrepreneurship, and the hazard of leaving such firms with higher *Relative Gini* to start a new venture is lower. This result supports the notion proposed that higher turnover decreases the hazard of transition to self-employment for individuals working in small firms.

This negative effect on the transition to entrepreneurship is, however, not observed in medium-sized firms, as the interaction between *Relative Gini* and the *Medium firm* dummy is positive and statistically significant at 5%. For larger firms, the result confirms previous studies that found a positive association between *Relative Gini* and the transition to entrepreneurship (Carnahan et al., 2012, Sørensen and Sharkey, 2014). Higher tournament in medium-sized and large firms has the effect of pushing individuals towards entrepreneurship, while for workers in small firms, an increased *Relative Gini* does not trigger transitions to entrepreneurship.

In general, the coefficient for *Small Firms* (negative, with p-value <0.001) gives support for the notion highlighted in previous studies that large parent firms are home to a lower number of entrepreneurial individuals, and that entrepreneurial rates in smaller firms are higher (Elfenbein, Hamilton and Zenger, 2010). The coefficient of *Medium firm* supports the idea that the difference for transitions to wage employment relative to the baseline category *Large firm* is not dramatic (the coefficient in column 2 has a p-value larger than 0.05). Moreover, there does not seem to be a difference when considering transitions to entrepreneurship as shown in column 4 (the p-value is larger than 0.1 which speaks against a systematic difference between medium and large firms). The coefficient for *Female* is negative for the outcome 1, transition to entrepreneurship, and for outcome 2, transition to other wage employment (and remains so in all columns of table 4 except for the "other" turnover episodes). This result is aligned to prior studies that document how entrepreneurial activities are more frequent among males compared to females (Frederiksen, 2008, Koellinger, Minniti and Schade, 2011, Langowitz and Minniti, 2007).

Similarly to what is already suggested from the summary statistics in tables 1 and 2, column 1 of table 4 also confirms that a higher number of firm affiliations is associated with higher probability of becoming an entrepreneur (the coefficient for *Number of firms* is positive, with p-value <0.001). This result supports the idea that frequent job-hopping is associated with higher chances of starting up a new firm, as previously found in similar studies (Astebro and Thompson, 2011, Silva, 2007, Wagner, 2006). Furthermore, the relationship between transition to entrepreneurship and work tenure is negative (the coefficient of *Wage experience* is negative and significant at the 99% level), which confirms the notion that individuals with longer work

experience have a lower propensity to switch jobs (as for instance reported by Frederiksen, 2008).

As discussed in the method section, the analysis of table 4 is restricted to the individuals newly hired in 2002, in order to consider the group of individuals at the same onset of risk of leaving their current employment. Focusing on newly hired individuals makes it easier to isolate the phenomenon of transitions to entrepreneurship more precisely than in the case of extending the analysis to the whole workforce, since the newly hired individuals are subject to the forces shaping the transition in a similar fashion. For completeness, table 1 in the appendix shows the results obtained by not restricting the analysis to new hires and instead considering all the workers. It can be noted that the main effect of *Relative Gini* is positive and significant, a finding in line with previous results (Carnahan, Agarwal and Campbell, 2012, Sørensen and Sharkey, 2014)

4.5 Supplementary Analysis

In order to further investigate the associations between the variables presented, we have plotted the marginal effect of the coefficient for the probability of a transition to entrepreneurship at the various levels of *Relative Gini*, for the three groups of firm size.

*** INSERT FIGURE 1 ABOUT THERE ***

Figure 1 displays the marginal effect of *Relative Gini* on the probability of transition to entrepreneurship for the various levels of *Relative Gini*. The solid line corresponds to *Small firm*, the dashed line to *Medium firm*, and the dotted line represents *Large firm*. The effect of an

increase in *Relative Gini* on the probability of transition to entrepreneurship is positive for *Medium firm* and increases with higher levels of *Relative Gini*.

What is observed for small firms is however in net contrast. The transitions from small firms towards entrepreneurship decrease as *Relative Gini* increases. This supports the proposed mechanism taking place in small firms, where more entrepreneurially oriented individuals will be less likely to find an entrepreneurial career alternative outside a small firm that operates the tournament. For the category *Large firm*, there does not seem to be a sizeable effect of *Relative Gini* on the probability of transitioning to entrepreneurship. The dotted line appears to be flat, supporting the idea that in large firms workers do not show a strong interest in and preference for entrepreneurship (as for instance shown by Ozcan and Reichstein, 2009, Sørensen, 2007). For workers in large firms (those *a priori* less likely to transition to entrepreneurship), it seems that the tournament dynamics within the organization measured by *Relative Gini* are not able to trigger entrepreneurship as much as in *Medium firms*, where the effect is the largest.

*** INSERT FIGURE 2 ABOUT THERE ***

Figure 2 instead displays the marginal effect of *Relative Gini* on the probability of transition to wage employment. It shows that along this dimension, individuals working in large firms differ substantially from those in the other two groups, *Medium firm* and *Small firm*. Individuals in small and medium firms present a stable and similar pattern of transition to wage employment for the various levels of *Relative Gini*. For large firms, a low level of *Relative Gini* corresponds to a negative likelihood of transition to wage employment, supporting the idea that employees in this kind of organization do not have a preference for high wage dispersion and

tournament within the organization. For higher values of *Relative Gini*, however, the transition rate from large firms increases and is substantially higher than in smaller firms.

*** INSERT FIGURE 3 ABOUT THERE ***

Figure 3 reports the contrasted margin of two categories at a time, relative to the third one, which is omitted as the baseline. In the first panel of figure 3 the categories reported are Small firm (represented by the solid line) and Medium firm (represented by the dashed line), relative to Large firm (the third category, which is omitted). The first panel shows that for lower levels of Relative Gini workers in small firms have a higher probability of moving to entrepreneurship, and that this effect is different from medium firms' employees. For larger values of *Relative Gini* the transition to entrepreneurship declines while on the contrary, the share of transitions to entrepreneurship rises for workers in medium firms. Furthermore, panel 1 of figure 1 shows that small firms do not seem noticeably different from the other categories in terms of transitions to entrepreneurship for high values of Relative Gini. In contrast, medium firms present an opposite pattern, very similar to that of large firms for low values of Relative Gini (the confidence interval for the dashed line includes the zero, meaning that the difference with the omitted category is zero), while the confidence interval does not include zero for higher values of Relative Gini. Panels 2 and 3 report the marginal effects of Relative Gini on the probability of a transition to entrepreneurship, taking as the baseline medium firms (panel 2) and small firms (panel 3), respectively. From panel 2 it can be noted that the effect of Relative Gini is different for small and large firms compared to medium firms, but does not appear to be substantially different for the higher values of Relative Gini. Lastly, panel 3 of figure 1 shows how both for large and medium firms there seems to be a similar effect of Relative Gini on the

transition to entrepreneurship (relative to small firms) but at higher values of *Relative Gini* the effect for employees of medium firms is substantially positive relative to small firms and at the same time different than for large firms.

*** INSERT FIGURE 4 ABOUT THERE ***

Finally, figure 4 displays the effect of *Relative Gini* on the transition to other wage employment. Similarly to figure 2, the three panels have a different baseline: *Large firm* for panel 1, *Medium firm* for panel 2, and *Small firm* for panel 3. The graphs show that the effect of *Relative Gini* on the transition to other wage employment is essentially the same for small firms and medium firms. For the category *Large firm*, a low value of *Relative Gini* corresponds to a negative likelihood of movement to wage employment, but gradually the likelihood of transition to new wage employment increases with *Relative Gini*.

4.6 Discussion and Conclusions

The results of this study provide support for the claim that association between tournament structures and employees' likelihood of transitioning to entrepreneurship is highly contextual. Small firms are characterized by attracting individuals that are entrepreneurial and exhibit particular preferences in line with entrepreneurship. A tournament structure represents a particular contextual characteristic that allows small firms to retain their entrepreneurial individuals. Larger organizations, however, attract individuals with low entrepreneurial propensities. As a consequence, tournament structures will increase the labor turnover rate to entrepreneurship among their employees. When the wage dispersion within the organization increases, i.e. in a context in which the tournament among workers is more evident, workers of small firms will not leave for entrepreneurship, while on the contrary, workers in medium firms will respond to such a change with an increased propensity to start their own firm, i.e. with transitions to entrepreneurship.

These findings take into account individuals at the same onset of risk of transitioning to a new job, by restricting the analysis to all new hires. It is important to consider individuals who – at least theoretically – present the same risk of a transition to a new job or to entrepreneurship. This study contributes with careful attention to include in the analysis employees who are hired in the year prior to the time horizon considered (2003 to 2008). This expedient emphasizes that the positive effect of an increase of tournament within the firm on the transition to entrepreneurship is observed in medium firms, while it is counterbalanced by an opposed effect in small firms. Moreover, transitions to entrepreneurship out of large firms do not appear to be very sensitive to changes in the degree of tournament, an effect which can be due to the low propensity of these workers to choose *a priori* an entrepreneural setting.

Our findings have some limitations. First, because we do not have a way to allocate individuals to firms randomly or a natural experiment that might provide the necessary exogenous variation, we cannot completely rule out the possibility that our results are biased due to potential omitted variables. This can be the case if there are unobservable characteristics of the setting that drive both entrepreneurship and the tournament in the firm. However, we argue that the likelihood of this bias is relatively small since the tournament measure used in this analysis takes into account the direct competitors operating in the same industry.

Second, we rely on the observed selection in contextual settings in the form of firm size rather than the true work context preference. This measure is imperfect and leaves much to desire. There are numerous reasons why people may select into contexts that are different from the one that they in fact would prefer. We do, however, believe that firm size is a rather easily observable characteristic and that it is a relatively valid signal of the type of work context an individual selects into. For this reason, we believe that the measure is suitable despite its limitations.

Our study is closely related to recent research on entrepreneurship. Although individuals may certainly have predispositions, the episodic nature of entrepreneurship makes stable attributes an unlikely explanation for people's decision to become entrepreneurs (Carroll and Mosakowski, 1987). By showing that tournament can be regarded as a treatment that induces entrepreneurially minded employees to actually make the transition to entrepreneurship in determined circumstances (i.e. when their preferences are not aligned to the tournament structure), we contribute to the call by Sorensen and Fassiotto (2011) to conceptualize the parent firm as a source of incentives.

Our paper also contributes to the emerging literature examining the downsides of incentives by tournament. While it is well recognized that peer pressure can encourage additional work effort from coworkers, there are costs associated with peer pressure for the employers (Barron and Gjerde, 1997). An important category of these costs encompasses those related to sabotage (Carpenter, Matthews and Schirm, 2010, Charness, Masclet and Villeval, 2013, Harbring and Irlenbusch, 2011). We add to this literature by focusing on another negative implication of tournament: the turnover of entrepreneurially minded employees. This is a critical issue considering the role that these individuals play in a firm's innovation activity.

The findings of this paper have implications for managers of existing organizations who should devote attention to the characteristics of their incentive structure in order to proactively retain entrepreneurially minded employees.

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Tat	ole 1. Correlation Math	ix and Su	mmary S	Statistic	S												
		Mean	S.D.	Min	Max	(1)	(2)	(3)	(3)	(4)	(2)	(9)	(1)	(8)	(6)	(10)	
(1)	Entrepreneur	0.008	0.089	0	1	1											
5	Relative Gini	0.982	0.421	0	3.791	-0.013	-										
3	Number of Firms	2.612	0.784	5	5	0.022	0.025	-	-								
(4)	Female	0.371	0.483	0	-	-0.031	0.102 -	0.044 -	0.044	-							
(2)	Married	0.521	0.5	0	-	-0.002 -	0.046 -	0.157 -	0.157 0	.008	1					1 8	Tal
9	Children	0.88	0.325	0	1	0.011	-0.03 -	0.034 -	0.034 -	0.02	.222	-				bies	hlac
£	Education	0.02	0.14	0	1	-0.002	0.064	0.052 (0.052 (.052 -)- 990.0	0.034	-				
8	Wage Experience	-0.236	0.899	-1.835	2.128	-0.022 -	0.083 -	0.261 -	0.261 -(0.115 (.354 0	- 770.0	0.149	-			
6)	Wage Experience, sq.	0.864	0.859	0	4.527	-0.01	0.078	0.101 ()- 101 -(0.002 -	0.143 -(0.121 0	.165 -(.063	-		
(10)	Wage Earnings	2.85E+05 1	.69E+05	0	.19E+07	0.032 -	0.036 -	0.104 -	0.104 -(0.253 (.149 0	.067 -(0.047 0	.211 -0	.123	-	
(11)	Unemployed	0.015	0.122	0	1	0	0.04	0.029 (0.029 0	- 032 -	0.018 -().016 -()- 800.0	0.025 0	.013 -(0.146	
Note	». Number of observations: 2	47,744. Corr	elations hig	gher than	0.008 in a	bsolute v	alue are	significa	nt at 5%	level							

	Small Firms	Medium Firms	Large Firms	(1) vs. (2)	(1) vs. (3)	(2) vs. (3)
	(1)	(2)	(3)	(4)	(5)	(6)
Entrepreneur	0.012	0.008	0.005	***	***	***
Relative Gini	0.831	0.980	1.069	***	***	***
Number of Firms	2.685	2.64	2.557	***	***	***
Female	0.334	0.345	0.404	***	***	***
Married	0.511	0.530	0.522	***	***	***
Children	0.888	0.887	0.872	-	***	***
Education	0.018	0.018	0.022	-	***	***
Wage Experience	-0.267	-0.216	-0.227	***	***	-
Wage Experience, sq.	0.849	0.843	0.882	-	***	***
Wage Earnings	2.67E+05	2.90E+05	2.94E+05	***	***	***
Unemployed	0.022	0.014	0.012	***	***	***

Table 2. Summary statistics for size firm, with differences among the three groups.

Note. Columns 4 to 6 report significance for t-tests and chi2 tests for the differences between the groups. *** denotes significance at 0.001%.

Table 3. Distribution of firms and observations by firm size

	Small Firms	Medium Firms	Large Firms	Total
	70.36%	21.84%	7.81%	100%
Firms	17,394	5,399	1,930	24,723
	28.56%	21.66%	49.78%	100%
Observations	26,302	19,950	45,847	92,099

		Transition to			Transition to	
	Transition to	Wage	Other	Transition to	Wage	Other
	entrepreneurship	employment	Transitions	entrepreneurship	employment	Transitions
	(1)	(2)	(3)	(4)	(5)	(6)
Relative Gini	-0.032	0.196***	0.180***	0.545**	0.720***	0.536***
	(0.059)	(0.012)	(0.022)	(0.176)	(0.029)	(0.054)
Small Firm	0.804***	0.071***	0.147***	1.540***	0.722***	0.589***
	(0.064)	(0.013)	(0.024)	(0.195)	(0.035)	(0.066)
Medium Firm	0.171*	-0.012	0.037	0.149	0.611***	0.430***
	(0.076)	(0.014)	(0.025)	(0.239)	(0.044)	(0.080)
Relative Gini*Sm	all Firm			-0.777***	-0.649***	-0.441***
				(0.188)	(0.033)	(0.060)
Relative Gini*Me	dium Firm			0.041	-0.603***	-0.380***
				(0.222)	(0.041)	(0.073)
Female	-0.782***	-0.124***	0.059**	-0.796***	-0.128***	0.057**
	(0.066)	(0.011)	(0.021)	(0.065)	(0.011)	(0.021)
Number of	0.219***	0.248***	0.179***	0.216***	0.246***	0.178***
Firms						
	(0.031)	(0.007)	(0.012)	(0.031)	(0.007)	(0.012)
Parent firm Size	-0.000+	-0.000***	-0.000*	-0.000*	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	0.130*	-0.107***	-0.058**	0.132*	-0.105***	-0.057**
	(0.053)	(0.011)	(0.020)	(0.053)	(0.011)	(0.020)
Children	0.403***	0.059***	-0.125***	0.404***	0.059***	-0.126***
	(0.093)	(0.015)	(0.026)	(0.093)	(0.015)	(0.026)
Education	-0.362	0.052	0.022	-0.393+	0.028	0.008
	(0.225)	(0.037)	(0.060)	(0.225)	(0.037)	(0.060)
Wage	-0.473***	-0.196***	0.104***	-0.464***	-0.191***	0.107***
Experience						
	(0.036)	(0.006)	(0.011)	(0.036)	(0.006)	(0.011)
Wage	-0.187***	-0.010+	0.289***	-0.195***	-0.013*	0.287***
Experience, sq.						
· · ·	(0.037)	(0.006)	(0.010)	(0.037)	(0.006)	(0.010)
Wage Earnings	0.000***	-0.000***	-0.000***	0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Unemployed	0.328	0.191***	0.621***	0.317	0.195***	0.626***
	(0.228)	(0.046)	(0.058)	(0.228)	(0.046)	(0.058)
Constant	-6.219***	-1.792***	-2.056***	-6.731***	-2.278***	-2.393***
	(0.223)	(0.041)	(0.087)	(0.273)	(0.048)	(0.101)
Industry Dummie	s	Ye	es		Ye	es
Year Dummies		Ye	es		Ye	es
Observations		274,	738		274,	738
Pseudo R2		0.0	49		0.0	50
Chi2		25822	2.977		25694	1.733
Prob> Chi2		0.0	00		0.0	00
Log likelihood		-19747	3.605		-19724	4.167

Table 4. Multinomial Logit on Transition to new occupational state

Note. Unreported tests show that the coefficients of Relative Gini and its interaction with Small Firm in column 4 are different. Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

Figures

Figure 1. Effects of Relative Gini coefficient on the transition to Entrepreneurship



Figure 2. Effects of Gini Relative coefficient on the transition to Wage Employment







Note Panel 1: Small vs. Medium firms; Panel 2: Small vs. Large firms; Panel 3: Medium vs. Small firms.



Figure 4. Marginal effects on the probability of transition to wage employment for the three size groups

Note Panel 1: Small vs. Medium firms; Panel 2: Small vs. Large firms; Panel 3: Medium vs. Small firms.

Appendix

VARIABLES	Transition to Entrepreneurship	Transition to Wage Employment	Other Transitions	
	(1)	(2)	(3)	
Relative Gini	0.496***	0.125***	0.189***	
	(0.073)	(0.013)	(0.021)	
Small Firm	1.368***	-0.075***	0.107***	
	(0.082)	(0.015)	(0.025)	
Medium Firm	0.637***	-0.029	-0.051	
	(0.098)	(0.019)	(0.031)	
Relative Gini*Small Firm	-0.449***	0.012	-0.045*	
	(0.076)	(0.014)	(0.023)	
Relative Gini*Medium Firm	-0.302**	-0.012	0.050 +	
	(0.093)	(0.018)	(0.030)	
Tenure	0.014	-0.082***	-0.000	
	(0.011)	(0.002)	(0.004)	
Female	-0.840***	-0.106***	0.189***	
	(0.025)	(0.005)	(0.008)	
Number of Firms	0.007	-0.077***	0.001	
	(0.011)	(0.002)	(0.004)	
Parent firm Size	-0.838***	-0.106***	0.189***	
	(0.025)	(0.005)	(0.008)	
Married	0.270***	0.281***	0.178***	
	(0.021)	(0.005)	(0.009)	
Children	-0.000***	0.000***	0.000*	
	(0.000)	(0.000)	(0.000)	
Education	0.080***	-0.066***	0.021**	
	(0.020)	(0.004)	(0.007)	
Wage Experience	0.483***	0.088***	-0.130***	
5 1	(0.036)	(0.006)	(0.010)	
Wage Experience, sq.	0.012	0.055***	-0.030	
	(0.079)	(0.017)	(0.028)	
Wage Earnings	-0.382***	-0.198***	0.083***	
6 6	(0.012)	(0.003)	(0.004)	
Unemployed	-0.124***	0.001	0.421***	
	(0.013)	(0.002)	(0.003)	
Constant	-7.306***	-2.025***	-2.585***	
	(0.129)	(0.024)	(0.044)	
Industry Dummies		Yes		
Year Dummies		Yes		
Observations		2,448,992		
Pseudo R2		0.048		
Chi2		131447.525		
Prob> Chi2		0.000		
LOV HKEIINOOD		-138008/263		

Table 1. Multinomia	Logit on Transition	to new occupationa	l state for all	l employees
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Note. Unreported tests show that the coefficients of Relative Gini and its interaction with Small Firm are not different. Robust standard errors in parentheses, *** p<0.001, ** p<0.01, * p<0.05, + p<0.1

5. Conclusions

This PhD dissertation touches some of the central themes of the entrepreneurship literature from the perspective of labor economics. This approach makes it possible to advance our understanding of the dynamics of entrepreneurs in the labor market and their implications for the individuals and the firms involved. Throughout the dissertation it has been explicitly considered that the episode of self-employment is usually of a transitory nature and that not only the vast majority of entrepreneurs become founder after a period of work as employees in existing organizations; but also that the experience in entrepreneurship is followed by another in wage employment.

The three essays represent several dimensions and focus on different stages of the entrepreneurial process. Chapter 2 links the pre-entry experiences of individuals to their entrepreneurial outcomes. It focuses on the stage preceding the transition to entrepreneurship. The results of this essay show that entrepreneurial outcomes vary for entrepreneurs with a different background and extend our understanding of entrepreneurial performance in terms of firm survival. For younger entrepreneurs pre-entry experience in the labor market is much more important than for those in the later stages of the career.

Chapter 3 examines the impact on the propensity to change employer for individuals who become entrepreneurs, therefore focusing on the stage following the decision to enter entrepreneurship. The essay compares a carefully selected control group of wage workers with similar characteristic as the treatment group – i.e. the entrepreneurs. This comparison shows that following the decision to become entrepreneur, individuals enjoy greater stability in their current occupation. Finally, chapter 4 deals with the characteristic of the current employer and explores how these characteristics impact on the decision to become entrepreneur. The dependent variable is the transition to entrepreneurship over time, and the explanatory draws on the facet of labor market which is internal to organizations, as opposed to the previous chapters that consider the labor market experience across existing firms. The fourth chapter explicitly deals with one of the most easily observable firm characteristic that previous studies linked to entrepreneurial spawning – firm size – and links it to an important element of the organization, namely the tournament relative to the competitors.

The dissertation develops around the phenomenon of entrepreneurship defined as new firm foundation and each of the essays departs from this phenomenon to include workers in established organizations. This approach underlines the close interdependencies between new firms and existing organizations, and contributes to the necessary integration of the literatures of labor economics and entrepreneurship.

The three chapters also draw on a common empirical setting. All the essays rely in fact on the Danish integrated database for labor market research – IDA – that makes it possible to adopt the view of entrepreneurship through the lenses of labor economics. Fundamental for answering the three research questions are the details about individuals in the labor force, their employment history and the characteristics of incumbent firms.

It has to be pointed out that the decision to enter entrepreneurship and found a new firm might be endogenous to the individuals. Some of the characteristics that drive individuals' behavior in the labor market could potentially be the result of unobservable heterogeneity which might be systematically connected to the decision to become entrepreneur and to the entrepreneurial outcomes. In the dissertation efforts have been undertaken by crafting sophisticated empirical strategies to minimize the potential role of alternative explanation driven by this heterogeneity and limit the impact of this potential endogeneity: these include Heckman selection models and propensity score matching.

Stemming from the results and conclusions presented in the three articles, at least two main avenues for future research can be identified. First, future studies could contribute to unpack the mechanisms governing the growth of newly founded ventures in connection with the entrepreneurs' labor market experience. What are the connotations of pre entry experience of entrepreneurs who found the most successful ventures in terms of growth? Future research could be aimed at studying the relationship between entrepreneurs' experiences in the labor market and their entrepreneurial outcomes in terms of turnover or employment growth and the sustainability of these performances over time. Moreover, future studies could verify whether the peculiarities of labor market experiences produce the same performance implications in industries where the conditions for entry vary, such as information technology (characterized by lower entry barriers) or pharmaceutics (where complementary assets might instead be fundamental).

Second, another contribution of future research could be to consider entrepreneurship from a demand side. The dominant view of the transition to entrepreneurship from the point of view of the individual could be complemented with the one that considers the effort of firms to attract individual talent. The linkages between labor market and transition to entrepreneurship could be leveraged to impact on the management practices of existing organizations.

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