



It's about time: The timing of entrepreneurial experience and the career dynamics of university graduates

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ARTICLE INFO

Keywords:

Career dynamics
Entrepreneurial experience
University graduates
Wages

ABSTRACT

The labor market value of former entrepreneurs remains unclear, with both theory and empirical evidence offering mixed conclusions. We suggest that the timing of entrepreneurial experience matters and helps unravel this puzzle. Using Danish employer-employee data on a large sample of university graduates, we show that the option value of testing an entrepreneurial opportunity and then returning to paid employment decreases over an individual's career. We follow individuals for fifteen years and compare the labor market outcomes of never, early, and late entrepreneurs based on the timing and type of entrepreneurial experience in their careers. Compared to those who have never been entrepreneurs, early entrepreneurs earn higher wages, while late entrepreneurs experience a significant wage penalty in the long run. Both the timing and the type of entrepreneurial experience shape individuals' subsequent career trajectories and employers' uncertainty about their value, which partly explain long-term wage differentials.

1. Introduction

Universities and business schools have been focused on empowering students to become entrepreneurs with the hope of spawning creativity, innovation, and impactful ventures among their graduates (Bergmann et al., 2018; Larsson et al., 2017; Lee and Eesley, 2018). Indeed, many high-quality startups launched in the last few decades were founded by recent graduates (Åstebro et al., 2012; Müller, 2010), confirming that higher education institutions can serve as arenas for knowledge creation and innovative entrepreneurship (Autio et al., 2014). Graduates who become entrepreneurs can contribute to knowledge transfers in national innovation systems via the “knowledge spillovers channel” (Audretsch and Keilbach, 2008) even after they abandon entrepreneurship (see Distel et al., 2019). In fact, most university graduates who try to set up their own businesses, either early in their careers or in a later stage, eventually reappear in paid employment. For instance, Chris Barton co-founded Shazam during his MBA studies, but he left in 2004 to join Google and, later, Dropbox. Like Barton, many view entrepreneurship as a bridge between different career opportunities (Burton et al., 2016; Manso, 2016). However, does the labor market reward or penalize

entrepreneurial experience? Moreover, does the timing of this transition matter for subsequent career dynamics? This study shows that *whether* and *when* individuals become entrepreneurs may significantly shape their labor market value.

Framing entrepreneurship as a form of career mobility (Burton et al., 2016; Frederiksen et al., 2016; Sørensen and Sharkey, 2014) has led to new queries regarding its labor market implications. While past research has mostly compared the earnings of self-employed individuals to those of wage employees, and generally confirmed greater volatility among the former (Hamilton, 2000; Moskowitz and Vissing-Jørgensen, 2002; Åstebro et al., 2011; Åstebro and Chen, 2014), the labor market value of entrepreneurial experience remains unclear. On the one hand, according to a recent research stream, individuals have the option to quickly experiment with new ideas and then return to regular employment without major costs (Daly, 2015; Dillon and Stanton, 2017; Kerr et al., 2014; Manso, 2016; Raffie and Feng, 2014). More optimistic views even suggest that entrepreneurship can endow individuals with resources and capabilities that employers might demand and reward (Alvarez and Busenitz, 2001; Distel et al., 2019). On the other hand, employers may make negative attributions to former entrepreneurs, and perceive their

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experience as imperfectly portable or incompatible with their firms (Dokko et al., 2009; Marshall, 2016; Rider et al., 2019). Consequently, they may discount the wages of former entrepreneurs compared to those of other hires (e.g. Mahieu et al., 2019).

We posit that the timing of entrepreneurial spells in an individual's career partly explains this puzzle. In so doing, we add a crucial layer to the debate on *whether* entrepreneurial experience pays (e.g. Daly, 2015; Manso, 2016) by considering *when* individuals enter entrepreneurship during their careers—earlier, as the first occupational choice with virtually no labor market experience, or later, after a period as employees. The timing of this transition is important, as it represents different risks and opportunity costs depending on how plentiful individual resources and outside employment opportunities are (Arora and Nandkumar, 2011; Azoulay et al., 2019; Rider et al., 2019; Vereshchagina and Hopenhayn, 2009). Consequently, it can affect the performance thresholds and strategies set by entrepreneurs (Azoulay et al., 2019; Gimeno et al., 1997; Arora and Nandkumar, 2011) as well as their future careers if they return to wage employment.

We use Danish employer-employee data covering 64,298 university graduates who concluded their studies between 1990 and 1998. We follow their careers for 15 years after graduation and distinguish between never, early, and late entrepreneurs based on their occupational changes and respective timing. We compare their wages in the short and long runs as well as other outcomes using panel data models and instrumental variables to alleviate concerns regarding self-selection into entrepreneurship at different career stages.

Our results do not reveal any significant wage penalty for those who establish a business early in their careers. In fact, those who try entrepreneurship (including self-employment) soon after graduation before accumulating much labor market experience enjoy a wage premium relative to those who never engage in new venture creation. However, late entrepreneurs who return to paid employment experience a long-term wage penalty, which increases the later they interrupt their careers to set up a business, especially if they do so via self-employment (i. e. without personnel). These findings challenge recent evidence on the option value of entrepreneurship (e.g. Daly, 2015; Dillon and Stanton, 2017; Manso, 2016; Kerr et al., 2014; Raffie and Feng, 2014). The option to return to regular employment without significant pay cuts seems to vary with the timing and type of entrepreneurial experience. Moreover, our results suggest that work experience might be a double-edged sword for late entrepreneurs—they might perform better as entrepreneurs owing to the resources accumulated in previous jobs (Elfenbein et al., 2010; Sørensen and Fassiottto, 2011; Wennberg et al., 2011), but they may do so at the expense of a disruption in their careers if they return to paid employment, as their labor market value becomes more uncertain, especially after founding a less growth-oriented business.

This study contributes to the lively, but often conflicting, discussions on the value of entrepreneurial experience (Baptista et al., 2012; Daly, 2015; Failla et al., 2017; Luzzi and Sasson, 2016; Mahieu and Melillo, 2019; Marshall, 2016). By highlighting the overlooked aspect of the timing of entrepreneurship, we identify important boundary conditions in the returns to and option value of experimenting with business ideas (e.g. Manso, 2016). In addition, we contribute to the literature on career imprinting, especially the rich research stream showing that conditions at labor market entry, such as the stage of the business cycle or the first job assignment, lead to persistent differences in earnings and career paths (Altonji et al., 2016; Arellano-Bover, 2020; Cokx and Ghirelli, 2016; Beiler, 2017; Oreopoulos et al., 2012; Oyer 2006). We find distinct career dynamics depending on *when* individuals become entrepreneurs

and the *type* of entrepreneur they become (e.g. self-employed or employer), even if they are only entrepreneurs for a short period of time. As such, we document new sources of individual heterogeneity in labor market performance.

On a broader level, our findings are relevant for innovation and strategic human capital scholars. Prior entrepreneurial experience may signal skills that could be valuable for the hiring firm (e.g. Distel et al., 2019; Singh and Agrawal, 2011), but these skills may be hard to transfer or apply in the new job (Rider et al., 2019). Alternatively, prior entrepreneurial experience may create uncertainty about employees' commitment to the firm (Galperin et al., 2020). As such, our study serves as a starting point for investigating the opportunities and perils of hiring employees with entrepreneurial experience from an organizational perspective. On a more practical level, our findings add novel insights regarding the efforts of higher education institutions to encourage entrepreneurship via training programs (Åstebro et al., 2012; Bergmann et al., 2018; Larsson et al., 2017; Lee and Eesley, 2018; Wennberg et al., 2011). An understanding of the repercussions of entrepreneurship for careers, especially the hurdles that entrepreneurs might face when (re)entering the labor market, can improve the design of those programs and policies, and help both entrepreneurs and the organizations that later hire them by facilitating their reintegration into paid employment.

2. Theoretical background

2.1. The labor market value of former entrepreneurs: conflicting views

Individuals may shift occupations and transition into entrepreneurship during their careers as external circumstances and/or their own preferences change. These transitions should be treated as a form of career mobility (Burton et al., 2016; Frederiksen et al., 2016; Rider et al., 2019; Sørensen and Sharkey, 2014) that can shape individuals' trajectories and future labor market performance. A vivid scholarly debate has been particularly concerned with the income gap between entrepreneurs and wage employees (e.g. Åstebro and Chen, 2014; Moskowitz and Vissing-Jørgensen, 2002). Prior research shows that earnings are more volatile (Hamilton, 2000), and that both “stars” and “misfits” are more abundant among entrepreneurs than among employees (Åstebro et al., 2011). Non-pecuniary benefits often explain why many prefer entrepreneurship despite the unstable pay (Hamilton, 2000). Greater job stability, driven by a combination of better job matching and lock-in effects (e.g. personal attachment to the business and anticipated labor market penalties), can be another reason why some consider entrepreneurship a superior career choice (Failla et al., 2017). Nevertheless, many entrepreneurs quit relatively quickly and return to paid employment (Manso, 2016).

A related discussion centers on how former entrepreneurs fare in the labor market *after* entrepreneurship. The resource-based view of entrepreneurship suggests that former business owners possess valuable, rare, and inimitable resources and capabilities, which make them superior decision-makers, more alert to opportunities, and better at knowledge recombination (Alvarez and Busenitz, 2001; Busenitz and Barney, 1997). This suggests a “treatment effect” of entrepreneurial experience—experimenting with new ideas and founding a business can help individuals develop skills that are valuable in the labor market.

Entrepreneurs are also believed to be “jacks-of-all-trades” (Lazear, 2005) and to prefer variety more than non-entrepreneurs (Åstebro and Thompson, 2011) even before they establish a venture. Therefore, they

might be able to signal a balanced skill set to future employers, or a preference for certain jobs and tasks. As such, former entrepreneurs might constitute a unique sample of individuals and exhibit distinct performance when returning to wage employment due (at least in part) to “selection effects.” Entrepreneurship can therefore alter subsequent career trajectories in the labor market by, for instance, increasing the propensity to join (mostly small) firms in managerial positions and to quickly progress up the career ladder (Baptista et al., 2012) due to a combination of treatment and selection effects.¹

However, a more negative view has gained ground in this debate. Prior experience is neither always perfectly portable across firms (Dokko et al., 2009) nor immediately accessible to new employers, who often need to incur some absorption costs (Rider et al., 2019) to be able to exploit new hires’ knowledge (Singh and Agrawal, 2011). Entrepreneurs may develop preferences, traits, and routines (Åstebro and Thompson, 2011; Frederiksen et al., 2016; Hoang and Gimeno, 2010) that are incompatible with the roles and/or organizations they later wish to join. Hence, they may face skill-mismatch and wage penalties upon reentry to regular employment due to employers’ stigmatizing behavior (Koellinger et al., 2015), or uncertainty about their productivity (Mahieu et al., 2019; Mahieu and Melillo, 2019) and organizational fit (Marshall, 2016). In addition, entrepreneurs may intentionally select occupations and firms that pay less but grant them other non-pecuniary benefits (Stenard and Sauermann, 2016). Both selection and treatment effects remain valid under this alternative view of the value of entrepreneurial experience.

A recent debate within this realm provides a more nuanced view of this apparent puzzle by emphasizing the option value of entrepreneurship. Individuals can experiment with their ideas (Kerr et al., 2014) and suffer no penalty when they return to the salaried workforce as long as they quickly abandon those ideas if they are not viable (Manso, 2016).² In addition, this experience can inform individuals about their fitness for other occupations (Chatterji et al., 2016; Raffie and Feng, 2014) and, thereby, drive mobility in a search for a better match (Bidwell and Briscoe, 2010). However, is the option value of leaving entrepreneurship and returning to regular employment at no major cost constant over an individual’s career? We posit that the timing of entrepreneurial experience is an important and thus far overlooked aspect when assessing the labor market value of former entrepreneurs.

2.2. The timing of entrepreneurial experience

When to enter entrepreneurship, if ever, is a difficult choice for individuals. The opportunity costs of this transition vary throughout one’s career, so its timing often depends on how copious employment prospects are. The greater the opportunity costs at the time of entry, the higher the minimum performance thresholds individuals will set in order to remain entrepreneurs (Gimeno et al., 1997). They may either become more impatient and aggressive with their strategies to quickly cash out (or “pull the plug”; Arora and Nandkumar, 2011), or more committed and likely to invest in control-oriented strategies (e.g. through intellectual property protection) at the expense of speed (Ching et al., 2019).

Opportunity costs are naturally lower in earlier career stages, when sunk costs in specific occupations or family obligations are often minimal, firm- and job-specific human capital tend to be lower, and uncertainty about one’s own competences is greater. Therefore, mobility is

more common (Beiler, 2017; Larsson et al., 2017; Rider et al., 2019; Wasserman, 2012). The boundaryless view of careers, which tends to reduce the perceived risk in starting a venture given the belief that returning to regular employment is fairly easy (Marshall, 2016), may explain early transitions into entrepreneurship. Indeed, younger founders are often more willing to take risks (Vereshchagina and Hopenhayn, 2009) and prefer quick execution and experimentation (Ching et al., 2019). Also, as earlier entrants are more resource-constrained than those who found a business later in their careers (Azoulay et al., 2019), they are less subject to stigma if they fail (Baù et al., 2017) and to negative attributions by subsequent employers (Marshall, 2016). Thus, the costs of failing as an entrepreneur are expected to increase over time, becoming more pronounced for later entrants.

Nevertheless, later entrepreneurs may leverage the human, social, and financial capital accumulated in prior jobs (Wasserman, 2012). The resources they gathered as employees may both reduce the cost of business creation (Rider et al., 2019) and improve the likelihood of success (Azoulay et al., 2019; Vereshchagina and Hopenhayn, 2009). Thus, the knowledge and skills developed during entrepreneurship may be more valuable, rare, and inimitable (Alvarez and Busenitz, 2001) for later entrants and benefit the organizations they join to a greater extent (Distel et al., 2019; Singh and Agrawal, 2011). Yet, the costs that employers must incur to absorb that knowledge tends to increase with employees’ labor market experience (Rider et al., 2019), as the repertoire of cognitions and behaviors acquired in other jobs may not immediately fit with the new organizational context or role (Dokko et al., 2009; Hoang and Gimeno, 2010). As subsequent employers need to balance those integration costs with the exploitation of valuable knowledge, later entrepreneurs may be perceived as relatively riskier hires of uncertain value. Consequently, they may suffer a wage discount when returning to paid employment.

In conclusion, the timing of entrepreneurial experience is likely to affect the labor market value of former entrepreneurs through various non-mutually exclusive mechanisms. Overall, the integration of different perspectives leads us to expect the option value of testing an entrepreneurial opportunity and returning to paid employment without suffering major and persistent losses to decrease as an individual’s career advances. This is the case for several reasons. First, entrepreneurial experience in early career stages may not endow individuals with enough relevant knowledge and skills that future employers might exploit. It is also less likely to harm their careers if the entrepreneurial venture fails. Second, an experience in entrepreneurship after a period of employment may increase the chances of business success and the value of entrepreneurs turned employees. However, potential employers may face significant uncertainties regarding that value and barriers to capturing it. Therefore, an understanding of how the timing of entrepreneurial experience might shape individuals’ career dynamics and labor market performance can help unpack the puzzle regarding the returns to entrepreneurial experience. In the next two sections, we describe the data and methods used to investigate this issue.

3. Data and sample

To investigate how entrepreneurial experience and its timing affect labor market outcomes, we use employer-employee data from Denmark. We combine the “Integrated Database for Labor Market Research” (known as the IDA database) with the personal registers on education, employment, income, and demographic characteristics as well as firm-level data. These data, which are collected annually by Statistics Denmark, allow us to track individuals and their careers over time.

¹ Distel et al. (2019), for instance, find that MNC subsidiaries perform better when they hire former entrepreneurs as managers, suggesting that entrepreneurship has a treatment effect on managers’ cognition and behavior, which shapes the employer’s dynamic capabilities.

² However, Mahieu et al. (2019) find that, compared to longer entrepreneurship spells, quick exits are less informative about founders’ ability and may lead to larger wage discounts in subsequent employment.

3.1. Sample construction

We follow the first 15 years of the careers of a large sample of Danish university graduates who entered the labor market between 1990 and 1998.³ We selected individuals who were between the ages of 18 and 25 when they enrolled in their last university program and less than 30 years old when they graduated in order to focus on graduates without extensive experience before graduation. We additionally excluded those who took more than two years to find an occupation after graduation. With these sample selection criteria, we intend to minimize unobserved heterogeneity in individuals' motives, ambitions, constraints, or other characteristics that could simultaneously affect their decision (and timing) to enter entrepreneurship and their future wages. Finally, to assess the labor market value of former (versus never) entrepreneurs, we selected those individuals who were wage employees in the long run (11–15 years after graduation) and excluded individuals who became entrepreneurs for the first time during that period. This left us with 64,298 individuals with no missing data.

We focus on young and skilled individuals, as these may have a greater entrepreneurial orientation and more potential for knowledge spillovers (Audretsch and Keilbach, 2008; Levine and Rubinstein, 2017) in addition to better labor market options than individuals with lower levels of education. This should help reduce unobserved variation in cognitive ability and opportunity costs as well as the likelihood of including necessity entrepreneurs, who are less growth-oriented or innovation driven (Romero and Martínez-Román, 2012). As such, this should move us closer to the individual-opportunity nexus view of entrepreneurship (Eckhardt and Shane, 2003). Nevertheless, in robustness tests, we consider different samples and types of entrepreneurship with varying potential for innovation and growth. We also apply methods that address endogeneity biases arising from individual unobserved heterogeneity, including different opportunity costs and external influences from peers, role models, or varying institutional settings.

3.2. Independent variables: early, late, and never entrepreneurs

We identify career spells in entrepreneurship based on individuals' primary occupations. If individuals appeared as self-employed, employers, or founders within ten years of graduation, we classify them as *former entrepreneurs*.⁴ To account for the *timing* of entrepreneurial experience, we check *when* they first became entrepreneurs. If they were entrepreneurs at the outset of their careers, we classify them as *early entrepreneurs*. Those who became entrepreneurs after a time in paid employment were considered *late entrepreneurs*. In robustness tests, we use alternative cutoffs to define *early* and *late entrepreneurs*. Those with no record in entrepreneurship during the entire period are classified as *never entrepreneurs*.

Table 1 reports descriptive statistics for the different groups. A total of 1557 individuals became entrepreneurs during the first 10 years of their careers and 18% of them did so right after graduation. If we use a five-year cutoff instead, we identify 921 early (59%) and 636 late entrepreneurs (41%). This indicates that most graduates with entrepreneurial intentions try entrepreneurship within five years of graduation.

³ As the data were available until 2012, we could not follow graduates who entered the labor market after 1998 for the same period of 15 years. We excluded graduates starting their career before 1990 given the lack of firm-level data for earlier periods.

⁴ In line with Sørensen (2007), founders (or incorporated entrepreneurs) are those working in a new firm with a maximum of three people, or anyone in a managerial role in a new firm with four or more employees. The three top wage earners in a firm at founding were also classified as founders if none of the people in that firm had a managerial position.

3.3. Dependent variable: long-term wages

Our main dependent variable is the yearly wage income (DKK 1000, in logs) earned by individuals in our sample in their main jobs 11 to 15 years after entering the labor market. As with all monetary variables in our analysis, we adjusted wages for inflation using the Consumer Price Index (CPI 2000 = 100). Table 1 indicates that never entrepreneurs earn 4% higher wages than former entrepreneurs. Yet, we observe substantial heterogeneity among the latter—early entrepreneurs earn higher wages than later entrepreneurs. This is particularly true when comparing very early (5.72) and very late entrepreneurs (5.58).

3.4. Control variables

We account for a rich set of variables that can affect both wages and entrepreneurial experience (see Table 1). First, we control for several demographic characteristics, including age, gender, education (level and field), civil status, the time gap between graduation and labor market entry, whether individuals had children, the region where they lived, and parental information (i.e. parental income and whether at least one of the parents had a university education). We note several interesting differences between former entrepreneurs and never entrepreneurs. For example, women are comparatively underrepresented among entrepreneurs, especially early entrepreneurs. STEM and business graduates are more common among entrepreneurs (41% and 30%) than among never entrepreneurs (32% and 22%). Entrepreneurs are more often located in the capital, and less likely to be married or have children, which suggests that many individuals try entrepreneurship before they have family responsibilities (Wasserman, 2012).

The second set of control variables relates to individuals' labor market histories. They include years of experience (as entrepreneurs and as employees), tenure in the current job, (logged) earnings at entry in the labor market (to partly capture unobserved ability and initial opportunity costs), number of days worked in the reference year, type of contract (full-time or not), hierarchical position (which also captures differences in skills), and industry. Never entrepreneurs have longer tenures in their current jobs and more workdays in the reference year than former entrepreneurs, which may be related to the former's higher likelihood of having a full-time contract. Similar differences are also visible among entrepreneurs, as earlier entrants report higher statistics for tenure, days worked, and full-time contracts. Interestingly, former, especially early, entrepreneurs are more likely to hold managerial roles than never entrepreneurs. Overall, these statistics suggest that the different groups follow distinct trajectories in the labor market, which may explain wage gaps in the long run.

Firm characteristics also affect wages (Abowd et al., 1999; see Arellano-Bover, 2020 on the role of firm size). Therefore, we control for firm age, size, sector (private versus public), and foreign ownership. Former entrepreneurs in our sample tend to work in smaller, younger private firms more than their non-entrepreneur counterparts.

4. Methods

We next analyze the implications of entrepreneurial experience and its timing on long-term wages. Formally, we estimate the following linear wage model:

$$\log(WAGE_{ijt}) = \beta_0 + \beta_1 EARLY_i + \beta_2 LATE_i + X_{it}\delta + Z_{jt}\theta + T_t + \alpha_j + e_{ijt},$$

where $t \in [11, 15]$, $\log(WAGE_{ijt})$ is the logged wage that individual i earns in year t and firm j ; $EARLY_i$ and $LATE_i$ are dummy variables equal to 1 when the individual is classified as an early or a late entrepreneur, respectively; X_{it} and Z_{jt} are vectors of individual and firm controls, respectively; T_t represents year dummies; and α_j denotes firm fixed effects.

Despite the controls included in our model, concerns about omitted

Table 1

Descriptive statistics. Variables measured in years 11–15 since graduation.

	Cutoff at year one										Cutoff at year five				
	Never entrepreneurs		Former entrepreneurs		Early entrepreneurs		Late entrepreneurs		Early entrepreneurs		Late entrepreneurs				
Observations (N /%)	313,705	97.58	7,785	2.42		1,440	18.50	6,345	81.50		4,605	59.15	3,180	40.85	
Individuals (N /%)	62,741	97.58	1,557	2.42		288	18.50	1,269	81.50		921	59.15	636	40.85	
	Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.		Mean	S.D.	Mean	S.D.	
Dependent variable															
DV: Wage (in logarithm)	5.68	(0.59)	5.64	(0.70)	***	5.72	(0.63)	5.62	(0.72)	***	5.68	(0.67)	5.58	(0.75)	***
Demographic controls															
Age	38.30	(2.43)	38.36	(2.52)	**	38.74	(2.62)	38.27	(2.49)	***	38.41	(2.54)	38.28	(2.49)	**
Female	0.58	(0.49)	0.37	(0.48)	***	0.35	(0.48)	0.38	(0.48)	*	0.35	(0.48)	0.41	(0.48)	***
Education level achieved															
Bachelor	0.75	(0.43)	0.74	(0.44)	**	0.73	(0.45)	0.74	(0.44)		0.75	(0.43)	0.72	(0.45)	***
Master's	0.23	(0.42)	0.24	(0.43)	**	0.25	(0.43)	0.24	(0.43)		0.23	(0.42)	0.26	(0.44)	**
Ph.D.	0.02	(0.13)	0.02	(0.13)		0.02	(0.15)	0.02	(0.13)	**	0.02	(0.13)	0.02	(0.14)	
Education field															
Education	0.18	(0.39)	0.09	(0.29)	***	0.07	(0.25)	0.10	(0.29)	***	0.08	(0.27)	0.11	(0.32)	***
Health	0.17	(0.38)	0.09	(0.28)	***	0.09	(0.29)	0.08	(0.28)		0.10	(0.29)	0.07	(0.26)	***
IT & Communications	0.08	(0.26)	0.08	(0.27)		0.08	(0.27)	0.08	(0.27)		0.07	(0.26)	0.09	(0.28)	***
STEM	0.32	(0.47)	0.41	(0.49)	***	0.43	(0.49)	0.40	(0.49)	*	0.41	(0.49)	0.40	(0.49)	
Business / Economics	0.22	(0.41)	0.30	(0.46)	***	0.31	(0.46)	0.30	(0.46)	***	0.31	(0.46)	0.29	(0.45)	**
Other	0.03	(0.16)	0.04	(0.19)	***	0.02	(0.15)	0.04	(0.20)	***	0.04	(0.19)	0.04	(0.20)	
Civil status															
Single	0.25	(0.44)	0.28	(0.45)	***	0.25	(0.43)	0.28	(0.45)	**	0.29	(0.45)	0.26	(0.44)	**
Married	0.69	(0.46)	0.65	(0.48)	***	0.68	(0.47)	0.65	(0.48)	***	0.65	(0.48)	0.66	(0.47)	
Other	0.06	(0.23)	0.07	(0.25)	***	0.06	(0.25)	0.07	(0.25)		0.06	(0.24)	0.08	(0.27)	**
Children dummy	0.81	(0.39)	0.77	(0.42)	***	0.80	(0.40)	0.76	(0.43)	***	0.77	(0.42)	0.77	(0.42)	
Region															
North Denmark	0.09	(0.29)	0.09	(0.28)	**	0.10	(0.29)	0.08	(0.28)		0.09	(0.28)	0.09	(0.28)	
Central Denmark	0.23	(0.42)	0.22	(0.42)		0.23	(0.42)	0.22	(0.42)		0.23	(0.42)	0.22	(0.41)	
Southern Denmark	0.20	(0.40)	0.17	(0.38)	***	0.17	(0.38)	0.17	(0.38)		0.18	(0.38)	0.16	(0.37)	**
Capital	0.35	(0.48)	0.40	(0.49)	***	0.39	(0.49)	0.40	(0.49)		0.39	(0.49)	0.41	(0.49)	*
Zealand	0.13	(0.34)	0.12	(0.33)	**	0.11	(0.32)	0.13	(0.33)		0.12	(0.32)	0.13	(0.34)	
Parental information															
Income (log)	5.50	(0.60)	5.51	(0.74)		5.47	(0.71)	5.52	(0.75)	**	5.51	(0.76)	5.51	(0.71)	
University education	0.37	(0.48)	0.40	(0.49)	***	0.36	(0.48)	0.40	(0.49)	***	0.39	(0.49)	0.40	(0.49)	
Labor market controls															
Years of labor market experience	12.42	(1.81)	12.14	(1.96)	***	12.31	(1.97)	12.11	(1.96)	***	12.29	(1.87)	11.94	(2.07)	***
Tenure	4.96	(4.16)	3.39	(2.68)	***	4.09	(3.21)	3.23	(2.51)	***	3.88	(3.00)	2.67	(1.92)	***
Earnings in year 1 (log)	4.94	(0.71)	4.60	(1.28)	***	3.40	(2.00)	4.87	(0.83)	***	4.40	(1.48)	4.90	(0.83)	***
Number of days worked per year	331.98	(87.30)	319.98	(99.98)	***	328.29	(90.49)	318.06	(101.96)	***	322.76	(98.97)	315.90	(101.32)	***
Fulltime contract dummy	0.86	(0.35)	0.80	(0.40)	***	0.84	(0.37)	0.79	(0.40)	***	0.82	(0.39)	0.78	(0.41)	***
Occupational classification															
Elementary occupations	0.01	(0.08)	0.01	(0.12)	***	0.01	(0.11)	0.01	(0.12)		0.01	(0.12)	0.01	(0.12)	
Plant and machine operators	0.02	(0.14)	0.03	(0.18)	***	0.03	(0.17)	0.03	(0.18)		0.04	(0.19)	0.03	(0.16)	***
Craft and related trade workers	0.01	(0.08)	0.01	(0.08)		0.01	(0.10)	0.01	(0.08)		0.01	(0.08)	0.01	(0.08)	
Skilled primary sector workers	0.00	(0.02)	0.00	(0.04)	***	0.00	(0.00)	0.00	(0.04)		0.00	(0.03)	0.00	(0.05)	**
Services and sales workers	0.03	(0.18)	0.03	(0.18)		0.02	(0.15)	0.04	(0.18)	**	0.04	(0.19)	0.03	(0.18)	
Clerical support workers	0.04	(0.21)	0.04	(0.20)		0.03	(0.18)	0.05	(0.19)	**	0.04	(0.20)	0.04	(0.20)	
Technicians	0.37	(0.48)	0.26	(0.44)	***	0.31	(0.46)	0.25	(0.43)	***	0.28	(0.45)	0.23	(0.42)	***

(continued on next page)

Table 1 (continued)

						Cutoff at year one					Cutoff at year five					
						Never entrepreneurs		Former entrepreneurs			Early entrepreneurs		Late entrepreneurs			Early entrepreneurs
Industry (1-digit level)	Professionals	0.41	(0.49)	0.32	(0.47)	***	0.33	(0.47)	0.32	(0.47)		0.31	(0.46)	0.34	(0.47)	***
	Managers	0.06	(0.23)	0.08	(0.27)	***	0.09	(0.28)	0.08	(0.26)		0.08	(0.27)	0.07	(0.26)	*
	Armed forces occupations	0.00	(0.02)	0.00	(0.06)		0.00	(0.00)	0.00	(0.06)	**	0.00	(0.05)	0.00	(0.07)	**
	Undisclosed	0.05	(0.21)	0.21	(0.41)	***	0.17	(0.38)	0.22	(0.41)	***	0.20	(0.40)	0.23	(0.42)	***
	Primary activities	0.00	(0.07)	0.01	(0.10)	***	0.01	(0.08)	0.01	(0.10)		0.01	(0.09)	0.01	(0.11)	
	Manufacturing	0.15	(0.36)	0.14	(0.34)	***	0.17	(0.37)	0.13	(0.34)	***	0.13	(0.34)	0.14	(0.35)	
	Water, gas, and electricity	0.01	(0.10)	0.00	(0.07)	***	0.01	(0.09)	0.00	(0.06)	**	0.01	(0.08)	0.00	(0.05)	**
	Construction	0.02	(0.15)	0.06	(0.25)	***	0.04	(0.20)	0.07	(0.26)	***	0.07	(0.26)	0.05	(0.23)	***
	Wholesale and retail sale	0.08	(0.27)	0.13	(0.33)	***	0.14	(0.35)	0.12	(0.33)	**	0.14	(0.34)	0.11	(0.32)	***
	Hotels, restaurants, hospitality	0.00	(0.06)	0.01	(0.09)	***	0.00	(0.03)	0.01	(0.10)	***	0.01	(0.09)	0.01	(0.09)	
	Transport and communications	0.04	(0.20)	0.05	(0.21)	***	0.04	(0.20)	0.05	(0.22)		0.05	(0.22)	0.04	(0.20)	**
	Financial activities	0.03	(0.18)	0.04	(0.20)	***	0.05	(0.22)	0.04	(0.19)	**	0.04	(0.20)	0.04	(0.19)	
	Real estate and renting activities	0.17	(0.37)	0.26	(0.44)	***	0.27	(0.44)	0.25	(0.43)		0.25	(0.43)	0.27	(0.44)	*
	Public administration	0.07	(0.25)	0.04	(0.20)	***	0.04	(0.19)	0.04	(0.20)		0.04	(0.19)	0.05	(0.22)	***
	Education	0.15	(0.36)	0.10	(0.30)	***	0.08	(0.28)	0.11	(0.31)	**	0.10	(0.29)	0.11	(0.32)	**
Health care	0.23	(0.42)	0.11	(0.32)	***	0.12	(0.33)	0.11	(0.32)		0.12	(0.32)	0.11	(0.31)		
Other	0.03	(0.18)	0.04	(0.20)	***	0.03	(0.16)	0.05	(0.21)	***	0.04	(0.20)	0.05	(0.21)		
Firm-level controls																
Firm age	25.56	(21.61)	19.71	(20.24)	***	20.26	(19.29)	19.59	(20.45)		19.73	(20.86)	19.69	(19.31)		
Number of employees (log)	4.23	(3.62)	3.17	(3.11)	***	3.58	(3.13)	3.07	(3.09)	***	3.29	(3.12)	2.98	(3.08)	***	
Private sector dummy	0.51	(0.50)	0.74	(0.44)	***	0.75	(0.43)	0.74	(0.44)		0.75	(0.43)	0.73	(0.44)	*	
Foreign ownership	0.01	(0.08)	0.01	(0.09)		0.01	(0.10)	0.01	(0.08)		0.01	(0.09)	0.01	(0.09)		

Notes:

* $p < 0.10$.** $p < 0.05$.*** $p < 0.01$.

variable bias may still arise if unobserved factors are likely to influence both selection into (early or late) entrepreneurship and future wages. For example, entrepreneurs may be better represented at the tails of the ability distribution (Åstebro et al., 2011; Elfenbein et al., 2010), which may blur comparisons of their wages with those of never entrepreneurs. Likewise, entrepreneurs differ in their risk attitudes (Vereshchagina and Hopenhayn, 2009), which may affect their future trajectories and wages. Therefore, isolating “selection effects” driven by those unobserved factors from “treatment effects” is crucial in our analysis, as in any setting with major implications for practitioners and policy makers (e.g. Arellano-Bover, 2020; Bertoni et al., 2011; Kaiser and Kuhn, 2016).

We alleviate these concerns by using an instrumental variables (IV) approach. We instrument (the timing of) entrepreneurial experience with two variables. First, we exploit time variation in the total number of individuals graduating from university programs focused on entrepreneurship and innovation. Universities worldwide have gradually started offering entrepreneurship programs in recent decades, which has created access to infrastructures that support and legitimize entrepreneurship as a career choice. This, in turn, affects students’ perceptions of

the entrepreneurial climate surrounding them and the time needed to establish their own firms after graduation (Bergmann et al., 2018; Müller, 2010). In Denmark, the first students to graduate from entrepreneurship and/or innovation programs did so in 1990, and the numbers had grown by more than tenfold by 1998. Therefore, individuals graduating at different points in time in our sample may have developed different climate perceptions and intentions of ever becoming an entrepreneur. Their intentions of doing so sooner or later in their careers might also have varied. Second, we exploit individual-level variation in the share of peers (graduates from the same institution) with entrepreneurial experience, measured by the time of graduation. Research shows that school and university peers imprint individuals’ occupation sorting in the long run (Brenøe and Zölitz, 2020), including entrepreneurial transitions (Kacperczyk, 2013).

Both instruments capture the formal and informal support graduates received from their alma mater, which could affect their perceptions about entrepreneurship. Moreover, both are exogenous, as they develop after individuals select their educational field and institution. As such, they are unrelated to individuals’ abilities or other unobserved traits

that could affect their long-term wages, especially after controlling for their labor market trajectories in the first decade after graduation.⁵ We use the multi-equation estimator developed by Roodman (2011) to jointly estimate probit models in the first stage (entrepreneurship transition) and linear models in the second stage (wages). In supplementary analyses, we evaluate short-term wages by focusing on a five-year rolling window following individuals' occupational transitions.

5. Timing of entrepreneurial experience and future wages

5.1. Baseline results

Table 2 reports our baseline results on the relationship between entrepreneurial experience (and its timing) and long-term wages. We first estimate the average wage gap between former and never entrepreneurs (Models 1 to 3). The remaining models account for the timing of entrepreneurial experience and distinguish early from late entrepreneurs using two alternative cutoffs at one and five years after graduation. The bottom rows specify the controls included in each model. The coefficients of those variables can be found in Table A1 (Appendix).

A comparison of former entrepreneurs with never entrepreneurs suggests no wage gap after controlling for the various aspects in which they differ. However, the results change after we account for the timing of entrepreneurial experience. Using Model 6 (with firm fixed effects) as a reference, we find a wage premium of 6% for very early entrepreneurs and a non-significant wage penalty of 1% for relatively later entrants compared to never entrepreneurs. Using the five-year cutoff (Model 9) still reveals a significant but smaller premium for early entrepreneurs and a more prominent penalty for late entrepreneurs (i.e. 3.5% lower wage earnings per year than never entrepreneurs). Therefore, neglecting the timing of entrepreneurship in an individual's career may hide important differences—former entrepreneurs may earn more or less than comparable individuals several years after graduation depending on how soon after their studies they leave regular employment to test an entrepreneurial opportunity or their abilities as entrepreneurs.

5.2. Robustness checks

We conduct several checks to test the sensitivity of these findings to: a) sampling choices, b) the selection of timing cutoffs, and c) definitions of entrepreneurship. First, we restrict the estimation to graduates entering the labor market right after graduation (Table A2a). Those who take longer may do so because of a “gap year” or for involuntary reasons we cannot observe. While we still find a significant and sizeable premium for early entrepreneurs, the penalty for late entrepreneurs vanishes. The longer period of time it takes late entrepreneurs to settle in their careers may partly explain their lower long-term earnings.

Next, we focus on full-time employees. Although early and late entrepreneurs may have different trajectories after they (re)enter paid employment, we still find a premium for the former and a penalty for the

latter when excluding those in part-time jobs (Table A2b).

In a third test, we include serial entrepreneurs in the estimation (Table A2c). Those who establish businesses more than once may provide even noisier signals to future employers and increase the uncertainty associated with hiring them. Indeed, this seems to harm wages—the penalty for late entrepreneurs found at the one-year cutoff becomes more significant and the bonus for early entrepreneurs at the five-year cutoff vanishes. These are the groups most likely to include serial entrepreneurs.

Table A2d includes those who became entrepreneurs before finishing their studies. This increases the number of early entrepreneurs but does not change the baseline findings. Table A2e reflects the possibility that some entrepreneurs may stay in business beyond year 10, which could introduce some sample-selection bias, as we do not observe wage earnings for these individuals in our estimation window. On the one hand, entrepreneurs who persist longer could be of higher ability and earn higher wages if they had returned to wage employment. On the other hand, many entrepreneurs remain in business even if those businesses underperform (Gimeno et al., 1997). Therefore, those who abandon the business sooner may do so because they realize it is not worth investing more resources and that they would do better in regular employment (Manso, 2016). We account for these potential biases with a Heckman selection model using the following exclusion restrictions: entrepreneurial influences from peers and parents by graduation, and the time and regional variation in the number of investment firms and funds. Social influences can have persistent effects in occupational sorting (Brenøe and Zölitz, 2020; Sørensen, 2007), and access to finance is vital for entrepreneurs to persist and grow their firms (OECD, 2020). The results of these models remain qualitatively similar, suggesting that unobservable factors explaining persistence in entrepreneurship do not significantly bias our findings.

The robustness to different timing cutoffs is tested in Table A3. We find an inverted U-shaped relationship between the time elapsed from graduation to entrepreneurship and long-term wages, with an inflexion point at year three. Figure A1 shows wage differences between entrepreneurs and never entrepreneurs depending on the timing of entry into entrepreneurship. It confirms that earlier (later) entrepreneurs experience a long-term pay bonus (cut).

Finally, in Table A4, we check the sensitivity of our findings to different types of entrepreneurship. Panel a) restricts the estimation to STEM and business graduates. These graduates may have more potential or aspirations to set up innovative ventures that create knowledge spillovers. The results are virtually unchanged. Using a similar rationale, panel b) defines entrepreneurs as those who became self-employed, employers, or founders in a knowledge-intensive industry. While most coefficients maintain their signs, they are rarely significant, possibly due to the small number of entrepreneurs in this test. Panel c) focuses on entrepreneurs with personnel, who may be more growth-oriented. Interestingly, we find no wage penalty associated with entrepreneurial experience in this case. In fact, we find tentative evidence of a pay premium that is only significant for later entrants. Late entrepreneurs may have accumulated resources and skills that enable them to set up more serious ventures and, in that case, they may be rewarded for their experience by future employers. Finally, in panel d), we define entrepreneurship as self-employment. The results are in line with Table 2.

Overall, our findings are consistent across alternative entrepreneurship definitions and sampling choices. The only differences, which are evident in the returns to different types (self-employment versus growth-oriented) of late entrepreneurship, corroborate our theoretical expectation that late entrepreneurs may be perceived as more uncertain hires. However, entrepreneurs who exhibited a growth orientation during their entrepreneurial experience could mitigate that uncertainty, yielding a reward comparable to the one found for early entrepreneurship.

⁵ We used alternative instruments in robustness checks. First, we exploited individual variation in the education subsidies (in log) received from the Danish government, which changed exogenously due to changes in the “SU” (*Statens Uddannelsesstøtte*) policy. A new policy, which came into effect in 1996, suddenly increased the monthly subsidy and extended the period of time that students could benefit from it. This exogenously changed the financial constraints that students might have faced by the time of graduation and, hence, might have influenced their decisions regarding entrepreneurship and its timing. Second, we used parental entrepreneurship (i.e. whether at least one of the individual's parents had been an entrepreneur by the time of his or her graduation). Earlier studies demonstrate the significant influence of entrepreneurial parents on the offspring's entrepreneurial behaviour but not on their performance as entrepreneurs (Lindquist et al., 2015; Nicolaou et al., 2008; Sørensen, 2007), which also suggests that having entrepreneurial parents is unlikely to directly affect individuals' long term wages.

Table 2

Timing of entrepreneurial experience and wages in years 11–15 after graduation. Linear wage estimations.

DV: log(wages)				Cutoff at year one			Cutoff at year five		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	OLS	OLS	Firm FE	OLS	OLS	Firm FE	OLS	OLS	Firm FE
Former entrepreneur	−0.005 (0.009)	0.001 (0.009)	0.003 (0.009)						
Early entrepreneur				0.069*** (0.019)	0.070*** (0.019)	0.064*** (0.016)	0.019 (0.011)	0.024** (0.011)	0.029** (0.011)
Late entrepreneur				−0.022** (0.010)	−0.015 (0.009)	−0.013 (0.010)	−0.040*** (0.014)	−0.033** (0.014)	−0.035** (0.015)
Individual-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Firm fixed effects	No	No	Yes	No	No	Yes	No	No	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.531	0.534	0.483	0.531	0.534	0.483	0.531	0.534	0.483

Notes: $N = 309,336$ observations. The within R-squared is displayed for the case of OLS regressions with firm fixed effects (columns 3, 6, and 9). Standard errors clustered at the firm-level in brackets. Table A.1 in the Appendix reports the coefficients for control variables obtained in model 2.

** $p < 0.05$.

*** $p < 0.01$.

5.3. IV results

We now address concerns regarding individual unobserved heterogeneity that can affect both selection into entrepreneurship at different times and future wages. We do so by comparing early and late entrepreneurs with never entrepreneurs in separate estimations using the IV approach described earlier. We present the results in Table 3. Both instruments are found to be relevant in predicting entrepreneurship, and they also respect the validity requirement based on the Sargan-Hansen test of overidentifying restrictions.

Model 1 finds no difference between former and never entrepreneurs. However, when considering the timing of entrepreneurship, we estimate a wage premium of 11% for very early entrepreneurs and a yearly penalty of 4.7% for later entrepreneurs. Although slightly larger,

Table 3

Timing of entrepreneurial experience and wages in years 11–15. Instrumental variable regressions.

DV: log(wages)	Cutoff at year one			Cutoff at year five	
	(1)	(2)	(3)	(4)	(5)
Former entrepreneur	−0.018 (0.011)				
Early entrepreneur		0.109*** (0.023)		0.023 (0.014)	
Late entrepreneur			−0.047*** (0.012)		−0.079*** (0.018)
Demographic controls	Yes	Yes	Yes	Yes	Yes
Labor market controls	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	54.14***	22.06***	19.25***	23.98***	15.83***
Hansen J statistic	0.812	0.649	0.881	0.624	0.771
N	309,408	303,544	308,079	306,470	305,153

Notes: Instrumental variable estimates obtained through conditional mixed process models using the estimator developed by Roodman (2011) which accounts for the binary nature of the endogenous variable. Entrepreneurial experience is instrumented with (i) total number of graduates in innovation and entrepreneurship programs in the country, by individual's year of graduation, and (ii) share of peers (graduates from the same university) with entrepreneurial experience that the focal individual had by the time of graduation. Standard errors clustered at the firm-level in brackets.

*** $p < 0.01$.

these estimates are aligned with those from baseline models.⁶ When we set the cutoff at five years after graduation, the difference between early and never entrepreneurs vanishes, while late entrepreneurs still face an annual pay cut of almost 8%. The use of other instrumental variables (i. e. individual variation in parental entrepreneurship and education subsidies received from the government) yields similar estimates (Table A5). Based on these results and simple back-of-the-envelope calculations, those who wait more than five years to try entrepreneurship may still be earning less than never and early entrepreneurs after two decades in the labor market, even if they settle in at their current jobs.⁷

Table A6 reports IV results for the different samples and definitions of entrepreneurs. While the results are virtually similar, it is important to reiterate that when using stricter definitions of entrepreneurship based on the knowledge intensity of the industry or the growth orientation of the venture (panels b and c), we find no penalty associated with late entrepreneurship transitions. However, the penalty remains sizeable and significant when we define entrepreneurship as self-employment (panel d).

5.4. Former entrepreneurs' wages upon reentry

Another key issue is how early and late entrepreneurs fare in the short run upon (re)entry into regular employment. We follow former entrepreneurs for five years after starting a new spell in paid employment and compare them with a control group of never entrepreneurs who also switched jobs. This enables us to track entrepreneurs and non-entrepreneurs in a rolling window of five years from the moment they moved out of their last occupation and started a new spell as wage employees. Table 4 reports the wage differences among the three groups

⁶ In line with Arellano-Bover (2020), larger IV estimates could mean that the effect of entrepreneurial experience at different career stages is heterogeneous across individuals, and possibly larger for graduates whose entry timing is more susceptible to an environment supportive of entrepreneurship (captured by our instruments). Using Marbach and Hangartner's (2020) approach, we did not find any evidence that the effects are driven by individuals with particular characteristics who could be more susceptible to those exogenous factors encouraging entrepreneurship sooner or later in their careers. Besides, we obtain very similar estimates when using different instruments (Table A5). Therefore, "local" treatment effects seem unlikely in our case.

⁷ We use IV estimates, namely the magnitude of the wage gaps between never, late, and early entrepreneurs (five-year cutoff) and the coefficient of tenure, which suggests an 1.3% increase in wages per year.

Table 4

Timing of entrepreneurial experience and wages in the five-year window after returning to paid employment. Instrumental variable regressions.

DV: log(wages)		Cutoff at year three		Cutoff at year five	
	(1)	(2)	(3)	(4)	(5)
Former entrepreneur	0.036** (0.014)				
Early entrepreneur		0.074*** (0.021)		0.051*** (0.018)	
Late entrepreneur			0.024 (0.017)		0.032 (0.020)
Demographic controls	Yes	Yes	Yes	Yes	Yes
Labor market controls	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-statistic	33.49***	24.30***	13.65***	27.76***	8.13***
Hansen J statistic	0.001	0.145	0.023	0.166	0.010
N	84,036	80,138	84,425	81,247	81,316

Notes as in Table 3. Never entrepreneurs in these estimations are restricted to job switchers, who are followed in the new job and compared to early and late entrepreneurs as they return to paid employment.

** $p < 0.05$.

*** $p < 0.01$.

and addresses endogeneity in the timing of entry using the same IV approach as in Table 3.⁸

In line with our prior findings, individuals entering entrepreneurship rather early in their careers earn more than never and late entrepreneurs. Interestingly, however, late entrepreneurs do not experience a significant wage penalty compared to employees with no prior entrepreneurial experience. Supplementary analyses distinguishing between different types of entrepreneurship show that individuals who set up a venture relatively later exhibit higher pay upon reentry to wage employment if their business was either growth-oriented (i.e. hired personnel) or operated in a knowledge-intensive industry (Table A7, panels b and c). However, interrupting wage employment to become self-employed for a while may result in a pay penalty upon reentry, although this is not significant according to panel d.

These collective analyses uncover two important post-hoc findings. First, both the timing of an entrepreneurship transition and the type of entrepreneur one tries to become matter in determining future labor market performance. Both can affect the signals provided to future employers and the uncertainty about the value of these employees for those firms. Second, while we find no evidence that an early spell in entrepreneurship harms future careers—it actually seems to yield a bonus in pay in both short and long runs—the same is not necessarily true for later transitions into entrepreneurship. The suspension of regular employment to undertake a temporary transition into entrepreneurship can be detrimental, but the impact on wages may only materialize in the long run. We now delve into the career dynamics and employers' profiles of early, late, and never entrepreneurs to uncover additional explanations for these differences.

6. Underlying mechanisms

6.1. Differences in mobility

We first analyze whether the different groups of graduates exhibit dissimilar career trajectories in terms of their job mobility and progression to managerial roles. With these analyses, we aim to understand who settles sooner in the labor market by finding a stable match in paid

employment as well as who is able to climb up the career ladder faster.

Table 5 reports results from accelerated failure time (AFT) models used to assess early and late entrepreneurs' survival in the first job they take after (re)entering wage employment. Early entrepreneurs survive longer in that job than their late counterparts, and this result holds regardless of the growth orientation signaled as business owners (Table A8).

We also compare early and late entrepreneurs with never entrepreneurs in their probability of leaving the job they hold 11 to 15 years after graduation. The observed probability of switching jobs at that point is about 15% in our sample. IV estimates (Table A9) suggest that late entrepreneurs are roughly 12% to 16% more likely than never entrepreneurs to exit their jobs depending on the cutoff used to define late entrepreneurship. Although this can be partly explained by the fact that late entrepreneurs had less time to find a good job match, this result is only found for individuals who interrupted wage employment for self-employment (Table A10), again suggesting that growth-oriented late entrepreneurs face no significant penalty or disadvantage in paid employment in the long run. However, we cannot infer whether the greater mobility observed among late entrepreneurs is voluntary or forced (due to potential discrimination faced in the firms they join or other search frictions).

Table 6 estimates the probability of reaching management ranks in the long run.⁹ We find a 1.2 percentage point higher probability of being a manager for very early entrepreneurs, which represents an increase of 18% in the predicted likelihood of holding a management role (6.7% according to our estimations). IV estimates confirm that the odds of being a manager at that point are higher for those who tried entrepreneurship very early, while we find the opposite (although only marginally significant) for late entrepreneurs. The results are similar when we distinguish between self-employed and growth-oriented entrepreneurs returning to paid employment (Table A11). Both types of very early entrepreneurs are more likely to hold management roles than never entrepreneurs, but differences vanish the longer they wait to set up their businesses (e.g. up to five years after graduation). The fact that very early entrepreneurs climb the ladder faster than other groups partially contributes to their wage premium in the long run.

6.2. Differences in employer characteristics

A second set of explanations relates to the types of firms that employ these individuals in the long run. We are particularly interested in

Table 5

Survival in the first post-entrepreneurship job.

DV: log(survival time)	Cutoff at year three		Cutoff at year five	
	(1)	(2)	(3)	(4)
Early entrepreneur	1.017*** (0.054)	0.534*** (0.056)	1.168*** (0.056)	0.591*** (0.058)
N	12,148	6926	12,148	6926

Notes: Estimations (Accelerated Time Failure models with a Weibull distribution) restricted to former entrepreneurs. This model is preferable over the traditional Cox model since the proportional hazard assumption is not supported. We use the cutoff at year three instead of year one to increase the number of early entrepreneurs in the sample. Columns (2) and (4) are restricted to the five-year window after entrepreneurs move to wage employment, to show that the differences are not driven by the time horizon we look at. Standard errors clustered at the firm-level in brackets.

*** $p < 0.01$.

⁸ We use year three instead of year one as a cutoff to improve the strength of our instruments in predicting early entrepreneurship.

⁹ Individuals are classified as managers if their primary occupation is listed as "manager" or the first digit of their occupational code (ISCO) is 1, which includes CEOs and several other managerial roles.

Table 6

Probability of occupying a managerial position in years 11–15 by type of entrepreneurial experience.

DV: Prob(leaving current job)	Cutoff at year one			Cutoff at year five		
	(1) m.e.	(2) IV	(3) IV	(4) m.e.	(5) IV	(6) IV
Early entrepreneur	0.012*** (0.003)	0.028*** (0.006)		0.002 (0.005)	−0.012 (0.008)	
Late entrepreneur	−0.001 (0.004)		−0.012* (0.007)	−0.002 (0.007)		−0.005 (0.010)
Kleibergen-Paap F-statistic		15.301***	25.212***		26.642***	6.724***
Hansen J statistic		1.025	0.061		0.056	0.153
N	309,262	303,581	300,321	309,262	306,414	305,099

Notes: All controls included. Columns (1) and (4) report average marginal effects from logit regressions. Entrepreneurial experience is instrumented as in Table 3. Standard errors clustered at the firm-level in brackets. * $p < 0.10$.

*** $p < 0.01$.

understanding whether these groups work in firms with different innovation potential, which may affect both pay and knowledge spillovers from entrepreneurial experience. We assess whether they work in a large or knowledge-intensive firm based on the firm's industry, skill intensity, and R&D activity. Prior research suggests that these features influence firms' innovation output (e.g. [Acs and Audretsch, 1988](#)). Even if the link between firm size and innovation remains unclear (see [Cohen, 2010](#), for a review), jobs in small and large firms have different attributes and attract employees with different preferences, which in turn affects these firms' innovation potential ([Sauer mann, 2018](#)). These analyses may also indicate whether labor market frictions may be at play if different individuals are differently represented across firms.

Table 7 summarizes the key results. By comparing the marginal effects in Models 1 and 5 with the predicted probability of working in a large firm, we conclude that former entrepreneurs are up to 10% less likely than never entrepreneurs to work in large firms. When we look at firm-level indicators of knowledge intensity, we find that although former entrepreneurs appear slightly more likely than never entrepreneurs to work in knowledge-intensive industries (columns 2 and 6), their employers seem to be less active in R&D and to have less skilled workforces on average (even when controlling for their smaller size). The differences tend to be more pronounced for individuals trying entrepreneurship relatively later, who might have not settled yet given their greater job mobility.

In sum, very early entrepreneurs differ less from never entrepreneurs in terms of the types of employers they have in the long run, although they tend to be slightly better represented in knowledge-intensive

industries. In contrast, those who interrupt wage employment for an entrepreneurial spell tend to work in smaller, less R&D-active, and less skill-intensive firms on average, regardless of the growth orientation exhibited in their prior business (Table A12). As wages are correlated with employers' innovation and knowledge intensity, wage gaps among the various groups can be explained, in part, by the type of firms members of each group work for in the long run.

7. Discussion

Anecdotal evidence often suggests that “it is never too late for entrepreneurship.” While stories of entrepreneurial success feature both younger and older entrepreneurs, what happens when entrepreneurs return to regular employment is rarely discussed. We followed the career trajectories of more than 64,000 university graduates in Denmark for 15 years and investigated the implications of taking a (early versus late) spell as an entrepreneur for their future wages, mobility (between jobs and up the career ladder), and type of employer. We found compelling evidence that the labor market value of former entrepreneurs varies with the timing and type of their entrepreneurial experience. This may help us understand the conflicting theoretical views and empirical evidence found in prior research.

First, individuals who try entrepreneurship in their early career stages do not seem to be penalized in the labor market. In fact, those who test their ideas soon after graduation seem to be better paid in the long run than never entrepreneurs, even when we account for the unobserved quality of the firms they join (via firm fixed effects) or unobserved

Table 7

Employer firm's characteristics by type of entrepreneurial experience (years 11–15).

	Cutoff at year one				Cutoff at year five			
	Large firm	Knowledge-intensive industry	R&D-active firm	Share of highly skilled workers	Large firm	Knowledge-intensive industry	R&D-active firm	Share of highly skilled workers
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Early entrepreneur	−0.007 (0.015)	0.026* (0.013)	0.008 (0.018)	0.015 (0.011)	−0.023*** (0.009)	0.015** (0.008)	−0.024** (0.011)	−0.020*** (0.006)
Late entrepreneur	−0.036*** (0.007)	0.012* (0.007)	−0.040*** (0.009)	−0.022*** (0.005)	−0.040*** (0.010)	0.014 (0.009)	−0.037*** (0.013)	−0.021*** (0.007)
N	309,336	309,336	263,468	296,664	309,336	309,336	263,468	296,664

Notes: Columns (1) and (5) report average marginal effects of early and late entrepreneurial experience (versus none) on the probability of working in a large firm (250+ employees). Columns (2) and (6) ((3) and (7)) show comparable marginal effects on the probability of working in a firm operating in a knowledge-intensive industry as defined in the footnote of Table A4 (R&D-active firm). Columns (4) and (8) are linear estimates of the relationship between entrepreneurial experience and the share of highly skilled workers in the firm. Firms are R&D-active if they have one or more R&D managers, based on their ISCO codes. Highly skilled workers are professionals or technicians with university education. In our sample, 8.5% of the firms were large, 18.7% operated in knowledge-intensive industries, 4.8% had at least one R&D manager, and the share of highly skilled workers was, on average, 35.6%. Among early (late) entrepreneurs with the cutoff at year five, 26.8% (23.6%) worked in large firms, 23.9% (24.9%) in knowledge-intensive industries, 11.5% (11.3%) in R&D-active firms, and the average share of highly skilled workers in the firms in which they worked was 35.4% (36.7%). The figures for never entrepreneurs were 41.1%, 15.8%, 17.3%, and 41.1%, respectively. All controls included. Standard errors clustered at the firm level in brackets.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

factors that drive their early entry into entrepreneurship (via instrumental variables). Second, those who become entrepreneurs at a relatively later stage face a sizeable and persistent wage penalty relative to never entrepreneurs. However, this penalty vanishes in case late entrepreneurs had founded a growth-oriented business or entered a knowledge-intensive industry. We suggest that a later entrepreneurship transition provides noisier signals to future employers about an individual's labor market value, but observable information about the type of business that late entrepreneurs tried to establish may mitigate the uncertainty associated with hiring them.

Moreover, we find distinct trajectories for early, late, and never entrepreneurs, which help clarify our understanding of their wage gaps in the long run. The timing of entrepreneurial experience significantly shapes the pace with which individuals move horizontally (across employers) and vertically (in hierarchies) in the labor market. The later individuals test their business ideas, the longer it takes them to settle down and reach higher ranks after they return to paid employment. This contributes to a wage penalty in the long run. In contrast, those experimenting with entrepreneurship early on are retained longer in subsequent jobs and achieve top ranks sooner than individuals in the other groups.

The types of firms in which former and never entrepreneurs work also contribute to wage gaps. Former, especially late, entrepreneurs work more often in smaller, less R&D-active, and less skill-intensive firms, which tend to pay lower wages on average. However, we cannot determine whether this is driven by a stronger preference for these firms among these individuals (see [Stenard and Sauermann, 2016](#)) or by larger and more innovative firms discriminating against former entrepreneurs due to negative attributions ([Marshall, 2016](#)).

Overall, our paper contributes to two vivid scholarly debates—one interested in the labor market value of former entrepreneurs (e.g. [Kaiser and Malchow-Møller, 2011](#); [Manso, 2016](#)), and the other concerned with university policies promoting entrepreneurial and innovative behaviors among their graduates ([Åstebro et al., 2012](#); [Bergmann et al., 2018](#); [Larsson et al., 2017](#); [Wennberg et al., 2011](#)). Research in these areas can have crucial practical implications if it identifies hurdles faced by prospective entrepreneurs that might be alleviated through policy interventions (e.g. [Autio and Rannikko, 2016](#); [Guzman and Kacperczyk, 2019](#); [Lee and Eesley, 2018](#)). By emphasizing both the risks and returns of entrepreneurial careers, our findings can inform scholars, institutions, and policymakers wishing to promote high-potential entrepreneurs without harming their careers.

Our findings also have theoretical implications. By showing that entrepreneurship can be perceived as a disruption in one's career depending on its timing, we identify relevant boundary conditions in the option value of experimenting with entrepreneurial ideas ([Dillon and Stanton, 2017](#); [Kerr et al., 2014](#); [Manso, 2016](#)). The value of testing an idea, quitting (even if one does so quickly), and returning to the labor market seems to decrease significantly over time. Surprisingly, labor experience may be a double-edged sword for prospective entrepreneurs—while it may help them perform better owing to the knowledge, social capital, and other resources they accumulate during paid employment, it also increases the opportunity costs of interrupting their careers to engage in entrepreneurship and then returning to regular employment, especially if they establish less growth-oriented or less knowledge-intensive businesses.

In addition, our assessment of the implications of the timing of entrepreneurship helps unravel the mixed findings from prior research. Former entrepreneurs fare differently than never entrepreneurs in the labor market—sometimes better (e.g. [Baptista et al., 2012](#); [Daly, 2015](#);

[Manso, 2016](#)) and sometimes worse (e.g. [Mahieu et al., 2019](#); [Mahieu and Melillo, 2019](#)). By showing that entry timing has a non-negligible impact on subsequent labor market mobility and career progress, we provide one potential explanation for this puzzle. Our study also relates to broader career imprinting theories, especially the stream showing that conditions and choices at the time of labor market entry taint future performance ([Altonji et al., 2016](#); [Arellano-Bover, 2020](#); [Oreopoulos et al., 2012](#); [Oyer 2006, 2008](#)). We show that this also applies to decisions regarding *when* to step into entrepreneurship. Future research could extend our work and investigate which individuals could benefit (or suffer) more from trying entrepreneurship sooner than later. For instance, [Kacperczyk and Younkin \(2019\)](#) suggest that entrepreneurship penalizes future employment, but less so for women than men. Therefore, an understanding of whether the career impact of entrepreneurship timing differs across individuals (also beyond university graduates) is crucial.

Our findings on the different representation of former and never entrepreneurs in large and more innovative firms also shed light on which organizations hire former entrepreneurs. Organizational scholars interested in learning-by-hiring effects have been searching for conditions in which new hires' experience and knowledge can be transferred, absorbed, and exploited by the organization (e.g. [Dokko et al., 2009](#); [Singh and Agrawal, 2011](#)). Empirical evidence on the value that former entrepreneurs can add to the firms they join is limited (see [Distel et al., 2019](#), for an exception). This constitutes a promising research avenue in light of extant theoretical predictions (e.g. [Marshall, 2016](#); [Rider et al., 2019](#)). Attempts to address this question can also improve our understanding of what entrepreneurs learn while setting up and running their businesses that might be valuable for subsequent employers.

We recognize some limitations in our analysis. First, while we have empirically addressed the possibility of endogeneity bias to the best of our ability, we remain cautious with our interpretation of certain effect sizes. We also avoid any explicit decomposition of selection and treatment effects in the absence of a setting resembling a randomized control trial or an exogenous shock that could be used as a natural experiment. In addition, exit from entrepreneurship may also be endogenous. Although our robustness checks addressing selection out of entrepreneurship do not reveal any major bias, future studies with research designs that can tackle endogeneity in both decisions (entry and exit) would be welcome.

Second, we highlight some data limitations, particularly with regard to our inability to capture the motivations of different types of entrepreneurs or the quality of their business opportunities. We distinguish among different types of entrepreneurs in our data (self-employed, employers, and founders of incorporated firms), which may signal different abilities and growth potential ([Levine and Rubinstein, 2017](#)). However, we cannot claim that these groups differ in terms of quality, commitment, motives, or growth aspirations. As some unobserved factors may remain uncaptured, more research that tackles these aspects using different data and/or methods is needed. The replication of our analysis in different countries (e.g. with more rigid labor markets and/or different attitudes towards failure) could also help us understand whether and how context matters.

Finally, we remain careful regarding the implications of our findings for individuals other than university graduates. Our sample has many advantages, but the generalizability of our results to the full population may be limited. We hope this study paves the way for additional research that expands our understanding of the mechanisms driving our findings.

CRedit authorship contribution statement

Adrian L. Merida: Conceptualization, Data curation, Formal analysis, Methodology, Visualization, Writing - original draft, Writing - review & editing. **Vera Rocha:** Conceptualization, Formal analysis, Methodology, Project administration, Supervision, Writing - original draft, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We sincerely thank Associate Editor Alex Coad and three anonymous reviewers for their guidance and valuable feedback throughout the review process. This study further benefited from feedback received at DRUID17 Conference in New York, the 2017 CEPR Workshop on Entrepreneurship in Copenhagen, the 7th Israel Strategy Conference in Haifa, DRUID18 in Copenhagen, the 25th CCC Doctoral Conference in Berkeley, the 78th Annual Academy of Management Meeting in Chicago, the 43rd Spanish Economic Association Symposium in Madrid and the Organizational Behavior group at Stanford Graduate School of Business.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:[10.1016/j.respol.2020.104135](https://doi.org/10.1016/j.respol.2020.104135).

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