FAILING JUST FINE:
ASSESSING CAREERS OF VENTURE CAPITAL-BACKED ENTREPRENEURS
VIA A NON-WAGE MEASURE

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NBER Working Paper No. 30179
June 2022
JEL No. J0,J3,J30,J31,J44,J6,J63

ABSTRACT

This paper proposes a non-pecuniary measure of career achievement, Seniority. Based on a database of over 5 million resumes, this metric exploits the variation in job titles and how long they take to attain. When non-monetary factors influence career choice, inference benefits from the use of non-wage measures, such as seniority. We apply it to study labor market outcomes of VC-backed entrepreneurs. Would-be founders experience accelerated career trajectories prior to founding, significantly outperforming graduates of same-tier colleges with similar first jobs. After exiting their start-ups, they obtain jobs about three years more senior than their right-before-founding peers. Even failed founders land jobs with higher seniority than those attained by their peers in the meantime.

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1 Introduction

Economists generally use pecuniary measures when studying labor market outcomes. A prime example is the large literature on the returns to college education (Lovenheim and Smith, 2011), which conventionally estimates these returns through wages (Angrist and Krueger, 1992; Dale and Krueger, 2011). Pecuniary outcome variables appeal for two reasons. First, being easily measurable, they are a convenient way for researchers to assess career advancement across individuals. Second, since money is a significant driver of human behavior, one of the most important dimensions of one's career trajectory is a monetary one. However, it is not the only dimension.

Wages may not capture important differences in advancement across industries or functional roles. Comparing salaries of senior academics, government officials, or non-profit executives to earnings of junior tech or finance professionals would likely lead to erroneous conclusions about career achievement. When non-pecuniary factors influence career choice, researchers must look beyond wages to draw meaningful inference.

We construct such non-wage measure of career achievement using a database of over 5 million resumes. This measure, which we call *Seniority*, exploits the variation in job titles and how long they take to attain. We show that seniority characterizes career trajectories in an intuitive and robust manner and provides valuable insights in a variety of settings, such as the returns to tertiary education and (in particular) the returns to venture capital (VC)-backed entrepreneurship.

The seniority measure relies upon the resume data from Emsi Burning Glass, which collects work history and education data from a large online professional network company. The sample includes the universe of online profiles of graduates from (approximately) the top 50

universities in the United States. Each profile contains the person's post-secondary education degrees, respective graduation dates, job titles, employers, employers' industry, respective job start dates, and corresponding end dates. Seniority is then calculated from these data by examining all individuals who achieve a certain title in a given industry and assigning the median time (in years) that it takes to first achieve that title after entering the labor force (i.e., undergraduate graduation). For example, the title "software engineer" in the IT industry is associated with a seniority level of 2, which indicates that the median individual in our sample who becomes a software engineer in the IT industry first achieves that title two years after graduating college. Thus, software engineer is a relatively junior title. By contrast, "senior software engineer" has a seniority level of 7. On the most senior end of the scale, "chief executive officer" has a seniority level of 16 and "principal" has a seniority level of 18. Intuitively, our seniority measure quantifies an individual's position within the organization's hierarchy.

For a given person in our database, it is important to note that the seniority measure of their job title is unrelated to that individual's tenure in the labor market.[1] An individual can even get "stuck" at the same seniority level until the end of his or her career. This feature starkly contrasts with studies that use workers' tenure or "years on the job" as a measure of relative career progression within firms (Topel and Ward, 1992; Buchinsky et al., 2010; Buhai et al., 2014). Therefore, an advantage of our seniority measure lies in its ability to quantify the relative economic significance of job changes. For example, we can say that an individual who spends one year in a seniority 3 job and gets promoted to a seniority 5 job has experienced a 1-year net gain in non-wage career progression, whereas this individual would have experienced no gain in non-wage

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[1] Using "senior software engineer" as an example, an exceptional individual may achieve the senior software engineer title in five years after graduating from college, while another may take more than seven years. The seniority value in both cases would be equal to how long it takes the median professional to achieve this title.

2

career progression if only promoted to a job with seniority 4. This statement thus has more economic meaning than an indicator that measures whether a person gets promoted. From this perspective, our seniority measure can also be used to capture the speed of a person's career progression over time: exceptional workers will advance faster and achieve higher seniority earlier in their careers.

To validate seniority, we present several empirical facts which confirm that the measure reasonably captures people's career trajectories. First, we directly compare our seniority measure with wage data from the Bureau of Labor Statistics (BLS). We show that seniority is positively correlated with wages: as a person moves farther away from their college graduation, both the seniority of their titles and their real wages increase over time. An interesting observation that emerges from this analysis is that people's careers tend to eventually reach a plateau—about 20 years after college graduation—both in terms of seniority and real wage. Achieving higher seniority titles becomes a very rare event later in careers. For example, only 18% of people of those with 20 or more years of career information ever achieve job titles that have seniority level of 20. Therefore, much like wage, the distribution of seniority is right-skewed.

Next, we run two verification analyses to ascertain the ability of seniority to measure achievement in one's career. First, we look at how the quality of one's undergraduate education (e.g., elite undergraduate college, tier-2 college, and other) affects their career outcomes. We find that the prestige of the college from which one graduates affects the speed and terminal level of their career trajectory. Specifically, graduates of elite undergraduate colleges rise in seniority faster and achieve higher terminal levels of seniority, on average, than graduates of tier-2 colleges. In turn, graduates of tier-2 colleges progress faster in their careers and achieve higher terminal seniority than those who graduate from lower-ranked schools.

A second verification test examines the impact of receiving an MBA degree. We divide individuals in our sample into three groups: those that pursue an elite MBA (Harvard, Stanford, Wharton, Chicago, or Northwestern), those that pursue a non-elite MBA, and all others. Prior to receiving an MBA, all three groups have comparable seniority. However, upon receiving an MBA degree, all MBA graduates receive a seniority boost relative to those who do not pursue an MBA, and the increase is substantially larger for elite MBA graduates. In addition, the difference in average seniority between these three groups increases over time. These patterns reassure us that our seniority measure reflects meaningful labor market information.

The second portion of this paper uses seniority and wage measures to examine career trajectories of VC-backed entrepreneurs—before and after the start-up's launch. A detailed examination of the career patterns of VC-backed entrepreneurs can shed light on the returns to entrepreneurship, as conclusions from the existing literature on this topic remain somewhat ambiguous. To elaborate, Evans and Leighton (1989); Moskowitz and Vissing-Jorgensen (2002); Hamilton (2000); and Hall and Woodward (2010) find that the returns to capital invested in entrepreneurial ventures is, on average, quite low. Similarly, Bruce and Schuetze (2004) find that entrepreneurs suffer penalties when returning to salaried employment. Others, in contrast, have focused on different types of business owners. In general, these papers find that entrepreneurs, not self-employed people, gain a post-entrepreneurship wage premium (Luzzi and Sasson (2016); Baptista et al (2012). Luzzi and Sasson (2016) use registry data of Norwegian firms and individual employment/wages while Baptista et al (2012) use Portuguese administrative data that classifies jobs into eight levels of seniority, based on required skills (e.g., manual labor is low and managerial skill is high) to show that understanding the type of business one owns matters when considering

the returns to entrepreneurship. Finally, Levine and Rubinstein (2017, 2022) show that those who start incorporated businesses earn substantially more than those who are self-employed.

None of these papers examine the pre- and post-founding career trajectories of VC-backed entrepreneurs. Our focus on VC-backed entrepreneurs allows us to isolate the returns of high-potential entrepreneurship (e.g., companies that raise tens or hundreds of millions of dollars) from the returns to small business ownership, in which the ability to scale up production and employment is substantially more constrained. Additionally, we are able to analyze heterogeneity in entrepreneurial returns for individuals formerly involved in successful, active, or failed start-up ventures. Most existing studies that examine labor market outcomes after entrepreneurship cannot observe whether entrepreneurs rejoin the labor force due to previous start-up failure, previous start-up success, or other reasons. By contrast, VC-backed companies have the clear goal of exiting via an IPO or a high-value acquisition, making firm success or failure easier to identify and study.

To conduct these analyses, we merge data on the founders of VC-backed companies collected from Dow Jones VentureSource (Amornsiripanitch et al., 2021) to our database of Emsi resumes. We were able to match nearly 30,000 founders across the two data sets. We begin our empirical analysis by documenting stylized facts about career trajectories of VC-backed founders prior to the founding of their start-up. We compare founders to a cohort of individuals who (i) graduated from a similar tier college in the same year and (ii) took a job with the same seniority in the same industry as the founder. We call this cohort the labor market entry cohort. We find that, on average, VC-backed founders are exceptional individuals. Specifically, their careers, as measured by both seniority and wage, progress faster and reach higher levels even before they found their companies.

Of the 30,000 VC-backed founders linked to Emsi resume data, 14,000 list a post-startup job. From this sample, we can measure the impact of starting a company on their career outcomes *after* they leave the company they founded. We identify the effects of founding a firm on career outcomes by comparing founders to individuals who (i) graduate from a similar tier college within two years of the founder and (ii) had a job with the same seniority and in the same industry at the time of the founder's pre-founding job. We call this cohort the pre-founding cohort. In regression analysis, we find that founders receive roughly a three-year increase in job seniority and 5% increase in real wages in their immediate post-founding job, relative to their pre-founding cohort peers. A three-year increase in job seniority is sizable given that (i) founders' average pre-founding jobs have a seniority of 12 and (ii) the average career in our sample plateaus at seniority level of 9. Surprisingly, this labor market premium holds across all venture outcomes that we explore: founders whose companies failed, founders whose companies succeeded, or founder who left companies that remain private. Although failed founders receive somewhat smaller labor market returns than the other two groups, the difference is not economically significant. Because we cannot fully address selection concerns, these results should be interpreted as suggestive correlations. Nonetheless, they could indicate that labor market returns to VC-backed entrepreneurship are positive regardless of whether the founder succeeds or fails. This may indicate that the labor market treats the receipt of venture funding as a positive signal of unobservable quality.

Through the construction of a new measure as well as its application in empirical analysis, this paper extends and connects various existing literatures. First, this paper contributes to multiple areas within the labor economics literature (Ashenfelter and Card, 2010) by providing a new general measure of career progression that captures a job's non-wage dimension via an objective

method. Our measure can compare career achievement across industries and functional areas in ways that wages cannot. To our knowledge, our seniority measure is a significant improvement upon methods that previous studies have used to capture non-wage changes in a person's career. One of these approaches exclusively considered one firm or industry in which there are well-defined career ladders. For example, Li and Walder (2001) study individuals who work for the Chinese government, while Johnson and Walker (2018) study US federal government employees. The main limitation of this approach is that the researcher is confined to only one industry or firm, potentially limiting the extent to which one can draw insights about general labor market phenomena. Our seniority measure does not have this limitation because, like wage, it is a general measure of career progression that can be used across industries.

A second approach that researchers have used relies on administrative data sets that readily classify jobs into levels where low-skilled (e.g., manual labor) jobs are generally ranked below high-skilled (e.g., managerial roles) jobs (Kunze, 2014; Kunze and Miller, 2014). The downside of this approach is that the classifications are arbitrarily defined, coarse, and generally not economically interpretable (i.e., it is hard to grasp the significance of moving from a level-1 job to a level-2 job). For example, Baptista et al. (2012) use administrative Portuguese data to classify *all jobs* in the formal Portuguese economy into eight levels. A related approach uses O*NET or survey data to classify jobs into low- and high-skill based on the set of skills associated with each job (Treiman, 1976; Speer, 2017). This approach also suffers from an arbitrary method of classification because researchers must determine how to map each job onto a skill distribution. Finally, researchers have used promotions as a proxy for career progression (Javdani and McGee, 2019). While intuitively appealing, this promotion-based approach often lacks clear economic interpretability, as it cannot account for the heterogeneous quality of different promotions. Our

seniority measure improves upon these earlier strategies by using a data-driven approach to classify job titles based on "years to first achievement" (i.e., seniority). Seniority values have a straightforward economic interpretation, especially when compared to the *actual* amount of time that a particular person took to achieve specific titles. Essentially, using our seniority measure, we can observe whether and to what extent individuals' careers are ahead or behind those of their peers.

Our paper also contributes to the literature on VC-backed entrepreneurship, the larger literature on the returns to entrepreneurship, and the literature on labor market outcomes of former entrepreneurs. We combine detailed resume data with detailed VC investment data to show that VC-backed entrepreneurs are, on average, exceptional relative to their peers even before they found their companies. Specifically, we find that would-be entrepreneurs experience accelerated career trajectories compared to non-founder peers who enter the labor force at the same time. VC-backed entrepreneurs begin their careers in higher-seniority jobs, and they progress up the seniority ladder much faster. Analogous facts hold for wages. To our knowledge, this is the first paper to document such facts.

Except for Manso (2016), the literature on the returns to entrepreneurship (Evans and Leighton, 1989; Hamilton, 2000; Moskowitz and Vissing-Jorgensen, 2002; Hall and Woodward, 2010) has largely concluded that pecuniary returns to entrepreneurship are on average low, which implies that individuals who choose to enter entrepreneurship must receive sizeable non-pecuniary benefits. We extend and reframe this debate by showing that, regardless of venture outcome, VC-backed entrepreneurs on average receive a large, positive labor market return in the form of (i) more senior post-founding jobs and (ii) wage increases. These results suggest that venture capital funding may be a stamp of quality, which better enables ex-founders to signal their superior quality

to potential employers *after* they leave the companies they started. More importantly, our findings suggest that the risk-return tradeoff that would-be entrepreneurs face may not be as grim as prior works (Moskowitz and Vissing-Jorgensen, 2002; Hall and Woodward, 2010) have suggested because VC-backed entrepreneurs seem to be taking on relatively low labor market risks. Thus, the findings imply that the role of non-pecuniary benefits may be smaller than previously thought.

Finally, our results also contribute to the literature on labor market outcomes of ex-entrepreneurs and the self-employed. The literature has found a mix of negative, null, and positive effects of entrepreneurship on earnings. Using data from the Panel Study of Income Dynamics, Bruce and Schuetze (2004) find that self-employment is associated with a decrease in wages upon return to paid employment, though this effect is mostly explained by those forced into self-employment upon job loss. Baptista et al. (2012) find largely similar results using Portuguese data. Botelho and Chang (2022) conducted an audit study which finds that, as job applicants, entrepreneurs receive fewer callbacks, and that these negative effects are most severe for successful entrepreneurs.

By contrast, using data from Norway, Luzzi and Sasson (2016) find that entrepreneurs enjoy a wage premium when they return to paid employment. They find no premium from leaving a poorly performing firm, but they find a positive premium for entrepreneurs leaving successful firms or firms in more innovative sectors. Relatedly, Sorenson et al. (2021) review the existing literature and conclude that entrepreneurs who begin firms that employ others, as opposed to those who become self-employed and do not hire employees, enjoy a wage increase when returning to salaried employment (Braguinsky et al., 2012; Sorgner et al., 2017). We contribute to this line of work by showing that, when returning to the labor force, VC-backed entrepreneurs, regardless of

venture outcome, receive increases in job title seniority and wages. This finding, in turn, also contributes to the literature on failure in entrepreneurship (Klimas et al., 2020).

The rest of the paper is organized as follows. Section 2 presents our data. In section 3, we provide detail on the construction of our seniority and wage variables as well as the outcomes of our two verification tests. Section 4 presents empirical results on the extent to which VC-backed entrepreneurship might predict and affect pre- and post-founding career outcomes. We conclude in section 5.

2 Data

Our data come from two main sources, VentureSource (VS) and Emsi Burning Glass (Emsi). VentureSource, a database commonly used in the literature, provides information on venture capital investments. Emsi collects resumes of a large number of individuals from a prominent professional networking site. In our study of venture-capital backed founders, the comprehensive resume data from Emsi supplement the VentureSource data by providing information on founder education, prior work experience, and post-founding career. We link founders to Emsi resumes based on a matching algorithm, the results of which are summarized in the Appendix.

2.1 Emsi Burning Glass

Emsi collects data on resumes from a professional networking site. Emsi's granular employment data include job title, start and end dates of employment, firm name, and NAICS (North American Industry Classification System) code. Emsi uses proprietary algorithms to streamline job titles and company names and to impute an Occupational Information Network (O*NET) code for each job.

Emsi also maintains data on individuals' education. These data include start and end dates, institution names, degree types, and areas of study. Education data help measure key elements of human capital, such as earning a STEM degree, receiving an MBA, or the rank of an undergraduate institution. We categorize colleges as one of three mutually exclusive groups: elite universities (e.g., Ivy League and similar institutions), second-tier institutions (e.g., elite liberal arts colleges and highly-ranked public universities), and non-top schools, which include all other US undergraduate institutions and all non-US institutions. Appendix Table 1 lists the elite and second-tier undergraduate institutions.

The bulk of our Emsi data are of graduates from 44 prominent undergraduate institutions in the US offering bachelor's degrees, listed in Appendix Table 2. These include Ivy League schools, other elite universities (e.g., Stanford, Duke), and large public universities, (e.g., University of Florida, University of Michigan). These data contain about 3.5 million resumes and are more heavily weighted towards recent graduates. We supplement this core dataset with resumes of individuals who share a name with a VS-identified founder.[2] This adds almost two million resumes into the dataset, bringing the total sample to about 5.3 million individuals.

The Emsi data are granular and comprehensive, but they are self-reported. As a result, there are gaps[3] in some careers and some underreporting of education data. However, 80% of founders have no gaps at all, and only 2% of founder-year combinations are considered to be gaps. If more successful individuals are more likely to report work history and thus appear in our sample, then our analysis likely yields a conservative estimate of the founders' labor market premium.

2.2 VentureSource

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[2] By disambiguating these potential name-only matches, we identify more founders, in particular foreign founders who did not attend college in the US.

[3] We consider a year to constitute a gap if there is no reported job in the year, but it is within the span of a person's career.

VentureSource contains detailed information on venture capital investors, investment characteristics, and key employees. Our data cover the near-universe of venture capital investments up to early 2019. For each portfolio company, VS identifies the individuals involved with the portfolio company including founders, investors, board members, and early hires. VS provides some employment history, but it is limited to a few roles prior to founding. Along with individuals, VS provides portfolio firm-round-investor level information on investments, including identity of investors, type of round, and the amount of capital raised. Finally, VS contains information on other portfolio firm characteristics, such as industry, location, and firm outcome.

We use the VS data to classify firms according to three outcomes: failure, success, and private & active. We identify failed firms as those VS records as going bankrupt or out of business, those acquired for less than total investment, and those that are listed as private but have not received funding in three years. We consider firms to be successful if they exited via an IPO or were acquired for a net value greater than total investment. Firms are labeled as private & active if they are listed by VS as private and have received funding within the last three years. Although these firms will eventually either fail or exit successfully, the outcome is unknown at the time of observation. Many of the founders of these firms still work at their firm, but many leave their VC-backed firm before an exit or failure and are thus included in our analysis.

Along with firm outcome, we construct other variables for portfolio companies and VCs, including firm location, industry, and a dummy variable for receiving investment from a top (most experienced) VC firm. We define VC experience as the number of unique portfolio companies in which a VC firm has invested in the previous 10 years. VC firms in the 99th percentile of investing experience in a given year are considered top VCs. Portfolio companies are considered to have received investment from a top VC if they did so in any round. Although we only identify a small

number of VCs as top VCs, they are so prolific that they invest in 26% of portfolio companies in our data.

The Emsi and VS data are not linked, so we employ a fuzzy matching algorithm to connect founders identified in VS with resumes in the Emsi data. Overall, we are able to link almost 30,000 out of about 55,000 founders of US-based VC-backed firms to resumes in the Emsi data. Of these matched founders, 14,000 have a clearly identified pre- and post-founding job and are included in our analysis. We summarize the merge results in more detail in Table 1 and Appendix Table 3 and show that there is limited selection bias on observable characteristics.

2.3 BLS Data

We use the BLS-maintained Occupation Employment and Wage Statistics to estimate wages. The BLS reports median wage by Standard Occupational Classification (SOC) code from 1999-2020.[4] We adjust all dollar values for inflation, using 2020 as the base year. Bureaucratic changes in data collection at the BLS may complicate estimation. Before 2003, the BLS used SIC rather than NAICS codes to classify industries, making it harder to match to the NAICS codes in the Emsi data. SOC classifications have changed over time, too, with systems for 2000, 2010, and 2018. As the systems have changed, the definitions of some codes have been adjusted, combined, or dropped. As a result, the BLS data do not cover every SOC-industry code for every year, so we linearly impute some missing values. For example, if we know the SOC-industry median wage in 2011 and 2013 but are missing 2012 wages, we interpolate 2012 wages as the mean of wages in 2011 and 2013. We then match the wage data to our Emsi resume data by SOC code, 3-digit

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[4] There are no BLS-maintained data prior to 1999, so we impute wages for jobs earlier than 1999 as 1999 wages. This is a relatively small part of our total sample and affects few post-founding jobs.

NAICS code, and year.[5] If a job is missing a NAICS code, we merge in the SOC-year national average instead.

There are a few drawbacks to using estimated wages. First, our estimation method produces coarse wage estimates that do not vary at the ONET-industry level even though our seniority measures does. Second, the literature has found significant wage differences across firms (e.g., Akerman et al., 2013), but we cannot capture this variation. Finally, ONET's classification is less fine for the most senior roles. This reduces variation of estimated wages for such positions, which may exacerbate issues caused by unobserved inter-firm wage differences. However, we do not expect these drawbacks to change the main conclusions of the paper as we use wage data mainly to validate the seniority measure and support the main post-founding seniority results.

2.4 Cohort creation

As described above and in more detail in the discussion of descriptive statistics, our sample of founders differs significantly from our sample of non-founders. While the underlying abilities are unobservable, we can measure some elements of and proxies for human capital, such as undergraduate institution, the presence of graduate degrees, or work experience, and match on these to produce comparable samples.

We construct two cohorts, one based on first job ("labor force entry cohort") and the other based on position prior to founding ("pre-founding cohort"). The labor force entry cohort is designed to measure differences over the entire career. Using this cohort, we demonstrate that founders outperform their initial peers both before and after entrepreneurship. The pre-founding cohort helps isolate the seniority changes around founding. Since we find that founders achieve

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[5] SOC and ONET codes are basically equivalent, though they are formatted slightly differently. Each digit in the SOC code identifies a level of specificity (e.g., 11-1123 and 11-1121 are both classified under the 11-1120 grouping, which is a subset of the 11-1100 grouping). If estimated wage is missing for the exact SOC code, we move to the next most granular SOC code until we get a match (e.g., from 11-1123 to 11-1120 or from 11-1120 to 11-1100).

more senior positions before founding, the pre-founding cohort is composed of similarly successful individuals to account for some of the unobserved ability that may drive founder performance.

We construct the cohorts with different methods. For the labor force entry cohort, we match to a founder all non-founders who graduated from an undergraduate institution in the same tier within two years of the founder. We also require a match on first job seniority and industry. To reduce potential bias from underreporting of early career jobs, we exclude founders with a first job seniority greater than 5.[6]

The pre-founding cohort is matched on more criteria. We require matched non-founders to have graduated a college of the same tier within two years of the founder, be working in the same industry, and hold a position of equal seniority to the matched founder in the founder's pre-founding role. This restricts the cohort to individuals who follow a similar career path as the founder up until founding.

3 Seniority Measure

Our seniority metric reflects a job title's rank within an organization's hierarchy, adding a new dimension along which one can evaluate job quality. For certain types of workers such as entrepreneurs, whose motivations for starting their own firm and accepting post-startup jobs may include non-pecuniary benefits (cf. Hamilton, 2000), seniority may more accurately capture a position's desirability than wage. In addition, seniority may more adequately compare the desirability of positions across industries where wages are systematically different. For example, the titles of "Assistant Professor" in higher education and "Vice President" in financial services

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[6] We still might include founders who do not report their first job. In these cases, we still create a matched cohort, just with a subsequent job. Since founders distinguish themselves early in their careers, this cohort is likely to be higher performing than a true labor force entry cohort, so bias would likely be against a positive difference for founders.

may have relatively similar seniority values, even if average wages for these two titles are far apart. In what follows, we describe how we construct seniority and validate it with a series of tests.

3.1 Construction

Seniority is defined as the number of years it takes a median individual to reach a given title within an industry. First, we estimate an individual i's labor force entry date using i's college graduation date, for all individuals $i \in I$ in the Emsi sample. Given an entry date, for every title t in industry j (henceforth denoted as tj) obtained by individual i, we calculate the time it takes i to attain tj as the difference between the date when tj first appears in i's work history and i's labor force entry date. We denote this time as $T_{i,tj}$. If tj appears more than once in individual i's work history, we use the earliest occurrence. Finally, we examine all individuals in the Emsi sample who have attained tj (i.e., I_{tj}) and use the median time it has taken them to do so as an initial seniority value $\widetilde{S_{tj}}$. In mathematical terms:

$$\widetilde{S_{tj}} = Median_{i \in I_{tj}}[T_{i,tj}]$$

We choose to calculate seniority using the first year of a title-industry's achievement even though individuals may hold multiple distinct jobs with the same title or hold a job for multiple years. Thus, higher levels of seniority indicate hierarchical *advancement* as opposed to *entrenchment*. Accordingly, for most individuals, their seniority plateaus at a maximum that total career length can easily exceed.

Lastly, we adjust the initial seniority values $\widetilde{S_{tj}}$ to account for the overrepresentation of younger individuals in our sample. The careers of many would keep progressing as time unfolds. As such, estimating seniority in the subsample of younger individuals, based on their truncated work histories, would inevitably bias (especially for advanced roles) the seniority scores down as

these would fail to account for the individuals yet to reach these positions.[7] To reduce the disproportionate influence of younger individuals who have achieved senior titles, we apply the following procedure. If the initial seniority $\widetilde{S_{tj}}$ is between 0 and 6, we use the entire dataset to calculate seniority S_{tj}, which in this setting equals $\widetilde{S_{tj}}$. If $\widetilde{S_{tj}}$ is between 7 and 12, we recalculate S_{tj} using only data from individuals who graduated before 2010. Finally, if $\widetilde{S_{tj}}$ is 13 or greater, we recalculate S_{tj} using only pre-2000 graduates.

3.2 Summary and Verification Exercises

In this section, we present descriptive statistics and validate our novel seniority metric. The seniority metric reflects basic intuitions. For example, more educated individuals reach higher levels of seniority, and high-level executive and oversight roles have the highest seniority. We also demonstrate how seniority can complement and differ from wages, as well as how trends in seniority over a career's entire course can differ in an intuitively expected manner for different groups of individuals.

Table 2 summarizes the careers of all individuals in our dataset. Not all individuals will enter our analysis of the VC-backed founders; many are neither founders nor part of a matched cohort. Still, we document several relevant characteristics about the entire sample. The median earliest job in our sample is 2005, and 80% of our sample are still in the labor force as of 2021, implying that our sample is relatively young. The average individual has about 3.5 jobs over an observed career of 11-12 years. At the job level, median (mean) seniority is about 4 (6), possibly suggesting that we observe our sample when they are in relatively junior positions. However, most

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[7] For instance, we might expect that most 1980 college graduates who will achieve the CEO position have already done so. However, it is likely that most individuals in the 2010 cohort who will become CEOs have not already done so, while the cohort's current CEOs have reached the position in 12 years or less. Since careers are right-censored, we might obtain a much lower estimate of CEO seniority using only the 2010 cohort than we would using only the 1980 cohort (or using the 2010 cohort with hypothetical data from 2050).

of our sample eventually attains more senior positions, with a median (75th percentile) highest seniority reached of 10 (15).

Job titles and how long they take a median professional to attain shed light on hierarchical structures within organizations. As such, our seniority measure shows an individual's position on a corporate ladder. We can also assess what fraction of professionals make it to the next rung as time goes by. Appendix Table 4 presents these summaries.

We see that very few individuals, even those with long careers, reach the highest levels of seniority. Only 20% of individuals with 30 years of observed career data reach a seniority of 20 or greater, and the median seniority reached for someone with an observed career length of 20 years is about 12.5.[8] This is consistent with the notion of a corporate pyramid as revealed by the data. Not everyone is promoted to the next seniority level. There are fewer spots at the top of a hierarchy, and it takes more years of experience to get there.

Figure 1 shows how the mean seniority of different individuals, grouped by the maximum seniority achieved over their careers, evolves over time. Separating individuals by maximum seniority, we see distinct groups of workers who differ not only in maximum seniority attained but also in overall career trajectory. Some groups start and end their careers in low-seniority jobs. Other groups ascend to medium-seniority jobs 10-15 years into their careers and remain in similar positions. Finally, a small group of individuals gradually ascend throughout their careers toward high levels of seniority.

More influential and prestigious titles fetch higher seniority values. Table 3 Panel A reports the 30 most common titles and their seniority. The most junior titles are typically held by undergraduates or recent graduates (e.g., intern, research assistant, software engineer). The most

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[8] High seniority jobs are very uncommon for individuals with shorter careers. Most of the individuals who reach senior jobs quickly are self-employed or are entrepreneurs who achieve high-seniority titles in small firms that they own.

senior titles are managerial roles, such as CEO, Principal, or President. As shown by Figure 2 and Table 1, the maximum seniority obtained by the average individual is around 10. This seniority level corresponds to titles like "senior manager," "general manager," or "vice president." These are relatively high-ranking roles that are typically a level or two below senior managerial roles. These summary statistics imply that most individuals progress through an organizational hierarchy over time but do not reach that organizational hierarchy's highest levels.

Table 3 Panel B reports the most and least senior titles with at least 100 observations in the entire dataset. Academic and advisory positions dominate the most senior titles, led by "professor emeritus" with a seniority of 35. The most junior titles reflect the college-educated nature of our sample, with titles like "dining service worker" and "student-athlete mentor" making up most of the junior titles. These are common student jobs held several years before an individual graduates and enters the labor force full-time.

Finally, we examine the relation between seniority and education. Figure 3 shows the average seniority over time for graduates of elite colleges, Tier 2 colleges, and all other colleges.[9] The averages are roughly equal at graduation, but over time, graduates of elite colleges outperform those from Tier 2 colleges, who in turn outperform graduates from non-elite and non-Tier 2 colleges. Though discernible, the differences are small. The divergence in seniority is more palpable when running comparisons by MBA attainment in Figure 4. Over their careers, recipients of elite MBAs reach, on average, a maximum seniority of 15, equivalent to the 75th percentile of maximum seniority. Individuals with non-elite MBAs reach, on average, a seniority of 11 or 12, while individuals without MBAs typically achieve a seniority of 9. Furthermore, post-MBA changes in career trajectory, as opposed to pre-MBA selection, appear to explain most of these

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[9] Appendix Table 1 presents the classification of elite and Tier 2 colleges.

seniority differences. Indeed, Figure 5 shows how seniority changes around MBA graduation, the date of which is centered at 0. All groups have similar early career trajectories; seniority for individuals who will earn MBAs is only slightly higher. At MBA graduation, however, MBAs' seniority increases immediately relative to non-MBAs, and the gap between MBAs' and non-MBAs' seniority only increases over time. This effect is larger for elite MBA recipients than for other MBA recipients. This further validates our seniority measure: Those with MBA and/or elite education appear to attain titles with higher seniority over the course of their careers.

4 Application – Career Trajectories of VC-Backed Entrepreneurs

In this section we apply our seniority variable to measure career progression and compare the results to industry-title wage estimates to evaluate the full career trajectories of VC-backed entrepreneurs. Given that both pecuniary and non-pecuniary benefits may motivate an individuals' decisions to (i) become an entrepreneur and (ii) choose a post-founding job (conditional on entrepreneurial entry), VC-backed entrepreneurship represents a suitable setting in which seniority can be used to complement wages as a measure of attainment. Since we observe venture capital-backed entrepreneurs' entire work histories, our analyses examine how their career trajectories are distinct from non-entrepreneurs (i) before they found their company, (ii) after they leave their start-up, and (iii) over their entire careers. By considering both pre- and post-founding outcomes, this section's analyses can simultaneously examine selection into, and labor market returns to entrepreneurship.

The remainder of this section proceeds as follows. First, we compare VC-backed entrepreneurs to the overall Emsi worker sample by collecting descriptive summary statistics on seniority, wages, and other characteristics within a subsample of founders in Emsi. Second, we demonstrate that founders prove exceptional even before founding. That is, their seniority and

wage-based career trajectories outperform similar non-founder peers prior to founding their startups. Finally, we show that, relative to a second set of similar non-founder peers (i.e., those who have similar labor market achievement to founders immediately prior to their founding), founders experience an *additional* increase in seniority and wages in their immediately subsequent post-founding job. Further, these additional post-founding premia prove robust across the performance/outcomes of founders' start-ups, though certain characteristics including start-up success do coincide with post-founding wage and seniority premia that are moderately larger in magnitude.

4.1 Overall Summary Statistics

For founders of VC-backed companies who possess both pre- and post-founding jobs recorded in the Emsi data, we report descriptive career statistics in Table 4.[10] As Table 4 shows, the average observed career length for these founders is more than 20 years, with a median start year of 1995. The majority of founders in our dataset entered the labor force between 1990 and 2010, and 85% appear to still be in the labor force. The median founder reports 7 distinct jobs. While founders hold both junior and senior jobs over their careers, they appear to spend significant amounts of time in senior roles. Across the sample, the median founder's average seniority over all jobs, weighted by job tenure, is 12.67 years. Founders' overall career trajectories markedly differ from non-founders. Indeed, when compared to medians in the entire sample (shown in Table 1), we see that founders began their careers about 10 years earlier (1995 vs. 2005), hold more jobs (7 vs. 4), and reach substantially higher levels of maximum seniority (21 vs. 10).[11] These high-

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[10] To more fully consider the extent to which one can evaluate entrepreneurs' post-founding careers, Table 5 reports the number of founders for whom we observe post-founding jobs. Many founders are either still working for the firm they started or do not report a post-founding job. Overall, we can identify a post-founding job for 75% of all founders but for almost 90% of founders whose firms have either exited or failed. Only 60% of founders who started still active firms list a post-founding role. Our descriptive statistics and regression analysis only consider founders with pre- and post-founding roles.

[11] Higher maximum seniority does not appear to be driven by high seniority in the founding role.

level differences reflect the Emsi sample's tilt toward professionals who—unlike VS-covered VC-backed entrepreneurs—entered the labor force relatively recently and haven't had time to accumulate much career history. Accounting for this imbalance, however, does not eliminate the contrast between founders and non-founders.

This gap in seniority between founders and non-founders applies not only to maximum attained seniority, but also to average seniority at every year/stage within a career. Figures 6 and 7 illustrate how the higher seniority achieved by founders persists across time. First, Figure 6 compares the seniority of all founders and all non-founders over time from labor market entry. Founders begin their careers at a higher seniority level and progress up the seniority ladder much faster than non-founders in the early years of their career. This graph suggests that founders are exceptional employees before they begin their firms, yet it remains ambiguous whether this seniority gap continues to grow in the later, post-founding years of founders' careers. To this end, Figure 7 compares the seniority of founders to non-founders who are matched to a pre-founding cohort of similar peers.[12] The figure's x-axis (time) is centered at the start of each founder's post-founding role. As Figure 7 suggests, the seniority gap between founders and non-founders continues to grow during founders' post-founding careers, even when founders are compared to exceptional non-founders who achieved similar pre-founding positions.

Thus, VC-backed founders outperform non-founders in the labor market. Descriptive evidence also suggests that they are also more educated. Table 6 lists the most common institutions for founders' undergraduate and MBA education. Elite universities, such as Stanford University

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[12] We discuss the definition of these peer cohorts in greater detail in sections 4.2 and 4.3. This restriction allows us to compare founders to non-founders who enjoyed similarly exceptional pre-founding careers. Given founders' rapid ascent up the seniority ladder in their pre-founding careers, we would expect that the post-founding seniority gap between founders and the representative non-founder would be even larger than the founder-peer gap displayed in Figure 7.

and Harvard University, produce the most VC-backed founders in our data. Despite the overrepresentation of elite universities in founders' undergraduate educations, the 20 most common US-based undergraduate schools only account for 30% of the VC-backed founders. The concentration of MBA programs is much greater. More than a third of our sample of founders who receive an MBA degree do so from Harvard, Stanford, or Wharton. Beyond institution name, we also examine founders' degree type and area of study. Descriptive statistics in Table 7 confirm the high-skilled nature of our founder sample suggested in Table 4. 18% of founders hold a bachelor's degree from an elite institution, defined as an Ivy League school, Duke University, MIT, Northwestern University, Stanford University, University of California, Berkeley, and University of Chicago. 23% of founders hold an MBA; slightly more than half of that group hold an elite MBA (defined as an MBA from Harvard, Chicago, Northwestern, Stanford, or Wharton). Finally, most founders appear to have acquired significant technical expertise via education: over 70% hold a STEM degree and 16% hold a PhD, of which about 80% are in a STEM field. Founders are more highly educated than non-founders, with significant differences especially in STEM and graduate education.

Finally, Table 8 reports the most common titles for founders in (i) their labor force entry job, (ii) their pre-founding job, and (iii) their post-founding job. Founders' labor force entry jobs are typically very junior. Common titles include "software engineer," "analyst," and "research associate." We define labor force entry jobs as the earliest reported job. We also require it to have a seniority of at least 0 and less than 4.[13] While a cutoff of less than 4 is somewhat arbitrary, clear

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[13] We exclude jobs with negative seniority since these are typically held before full-time labor force entry. We believe there is some underreporting of early career jobs, especially by individuals with longer careers. To minimize potential error, we exclude relatively senior first jobs from our tabulation. This results in fewer labor force entry jobs. However, this should not bias our key analysis of changes around the founding role since we can still clearly identify the pre- and post-founding roles for these founders.

non-entry level titles, like "senior associate" enter the list of most common titles when we allow titles with a seniority of 4 or greater.[14] Tightening the cutoff to 2 or 3 yields a qualitatively similar list.

We likewise consider (i) pre-founding jobs which we define as the job held by a founder immediately prior to entrepreneurial entry, and (ii) post-founding jobs which we define as the job held immediately after an entrepreneur leaves their start-up. Consistent with our assertions, the pre-founding titles listed in Table 8 suggest that founders make rapid progress in increasing their job seniority prior to founding. Within the table, the most common pre-founding titles appear to be managerial positions of "vice president," "CEO," and "CTO." Other pre-founding roles include (i) more senior technical roles (e.g., "senior software engineer") or (ii) managerial roles below the C-suite (e.g., "product manager"). Finally, Table 8 suggests that founders continue to occupy high-seniority post-founding roles. After founding, CEO and other senior executive roles appear as the most common positions, while founders also take on more senior (but perhaps less taxing) advisory roles (e.g., "director" or "mentor"). Thus, Table 8 reflects the career progression of founders. Largely starting their careers in skilled technical roles, founders climb up organizational hierarchies before starting their own firms. After leaving their start-up firms, founders continue to advance.

4.2 Pre-Founding Career Trajectories

As the initial summary statistics suggest, founders are exceptional individuals: they attain higher levels of education, rise further up the seniority-based hierarchy of jobs, and more quickly obtain high-seniority positions than non-founders on average. However, it remains unclear whether

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[14] We do not restrict titles to have a seniority of zero since many junior titles that appear to be at the bottom of hierarchies have positive seniority. For example, "software engineer" has a mean seniority of 2, and "analyst" has a mean seniority of 1, indicating that some individuals switch into these junior roles several years into their careers.

education or other characteristics can fully explain founders' superior labor market performance vis-à-vis non-founders, especially during founders' early pre-founding careers. Thus, in this subsection we provide suggestive evidence that education and other observable characteristics cannot fully explain founders' exceptional career performance before founding their companies. Even relative to individuals with similar educations and initial post-college jobs, future founders attain jobs with higher seniority and wages immediately before founding than non-founders do in a similar span of time.

First, to partially disentangle any explanatory impact education, industry characteristics, or time trends may have on founders' pre-founding careers, we match all founders in our data to a labor market entry cohort of non-founders. Specifically, for each founder, we assign every non-founder who (i) graduated in the same year, (ii) received their undergraduate education at a school of the same tier, and (iii) achieved a labor force entry job with the same seniority within the same industry as the founder at the time of labor market entry. This matching procedure aims to capture the non-founders who appear most similar to a given founder at their time of labor market entry. Since these non-founders have similar educational histories and enter the labor force with the same seniority in the same industry at the same time as our founders, comparison of founders with their respective labor market entry cohorts should effectively control for the role of education in explaining founders' apparently superior pre-founding career outcomes.

Accordingly, Table 9 summarizes founder seniority in pre-founding roles. Panel A indicates that the mean pre-founding seniority of founders' pre-founding jobs is around 12 years, with successful founders (i.e., founders who ultimately start a successful start-up) slightly more senior than failed founders and founders who leave active start-up firms. Likewise, and consistent with Figures 5 and 6, Panel B shows that founders achieve above-average seniority before

founding within their labor market entry cohorts. Specifically, the seniorities of their pre-founding jobs, on average, sit at the 70th percentile across all jobs held within their labor market entry cohort at a similar time.

As Table 9 suggests, founders outperform matched labor force entry cohorts before founding. To formalize this claim, we run fixed effects regressions to more rigorously quantify the extent to which founders attain more senior and higher paying pre-founding jobs. The regressions in Table 10 include labor market entry cohort fixed effects as well as a variety of demographic and additional educational controls. Table 10 Panel A shows that all founders attain pre-founding positions with 4-4.5 more years of seniority than matched non-founders in all specifications. These results are robust to including a variety of controls for gender, career length, education, and founder interaction effects. Table 10 Panel B reports results for pre-founding wages. Founders' pre-founding jobs have estimated wages that are 35-40% higher than matched non-founders' jobs. As in Panel A we include controls for education and interactions between the founder variable and the controls. Again, we find that results are robust to including these controls. Together, Panels A and B demonstrate that founders outperform similar college graduates in their careers before founding. Finally, both panels indicate that founders' exceptional pre-founding career performance remains robust across ultimate start-up outcomes. Successful, failed, and departed (i.e., those who left an active firm) founders all attain pre-founding jobs with higher seniority and wages than peers in their cohorts. Still, these pre-founding wage and seniority premia between founders and their non-founder peers appear to be slightly larger for successful founders than for failed and departed founders.

4.3 Post-Founding Returns to Entrepreneurship

Founders accumulate seniority and wage premia relative to their labor market entry peers during their pre-founding careers, and these premia persist during their post-founding careers, as shown in Appendix Tables 5 and 6. However, the extent to which ability-based selection into entrepreneurship or tangible returns to entrepreneurship explain the post-founding premia remains unclear. Accordingly, we match founders to a new set of similar peers (those that attain similar seniority to founders in their pre-founding roles) and obtain suggestive evidence that both selection and returns to entrepreneurship might explain the additional post-founding premia that all types of founders (on average) appear to enjoy.

First, we directly compare the seniority and wages of founders' pre-founding and post-founding jobs. In Table 11, we report the distribution of seniority in pre- and post-founding jobs, the difference in seniority between the pre- and post-founding jobs, and time spent in the startup job. The average increase in seniority across all founders is 2.54 years, though there is substantial heterogeneity. Founders of successful firms experience larger seniority gains (3.14 years) than founders of failed firms (2.39 years) or departed founders who left active firms (2.31 years). In addition, post-founding increases in seniority differ across a variety of firm and founder characteristics. Table 12 reports post-founding seniority increases within founder subgroups (i.e., successful, failed, and departed) by firm and founder characteristics. Some of these summary statistics are in line with expectations; for example, attending an elite undergraduate institution is associated with higher post-founding seniority for all subgroups of founders.

To complement our analysis of seniority changes, we also present descriptive statistics for changes in wages after entrepreneurial experience in Table 13. Results are similar: the overall post-founding increase in estimated wage across all founders is about $12,000, with successful founders enjoying a larger increase than failed or departed founders. As with seniority, there is considerable

variation in post-founding wage differences by firm and founder characteristics. Table 14 mirrors Table 12, describing wage changes instead of seniority changes. Again, there are differences within founder outcome subgroups. For example, holding an elite undergraduate degree is associated with a larger wage increase for founders who leave active firms than for other groups, and investment from a top VC is associated with a smaller wage increase for failed founders. As with seniority, founders attain higher pre-founding wages and earn more in post-founding employment than non-founders.

To complement our descriptive statistics, we also present regression analyses which evaluate how entrepreneurial experience might result in post-founding wage and seniority gains. Just as we show that founders have accelerated career achievement compared to other wage workers with a similar background before founding in section 4.2, we show here that they outperform workers with similar pre-founding career trajectories in the labor market after leaving their VC-backed firm. Specifically, for each founder we construct a "pre-founding" peer cohort, defined as the set of non-founder individuals who (i) graduated within two years of the given founder, (ii) attended a school in the same tier as the founder, and (iii) attained a job with the same seniority in the same industry as the founder's pre-founding job at the same time as the founder. Comparison with the pre-founding cohort enables us to better isolate the potential labor market returns to entrepreneurship. Specifically, whereas ability-based selection could account for most or all of the post-founding gap in wages and seniority between founders and their labor market entry peers, tangible returns to entrepreneurship could more plausibly explain a substantial portion of any wage and seniority premia that founders might enjoy over their pre-founding cohort peers in their post-founding positions because the pre-founding cohort peers had similar career achievement in the period from entering the labor market until immediately prior to founding of

their companies. Nonetheless, we admit that unobservable selection into entrepreneurship could still explain a portion of our results, even when we focus on this pre-founding peer group.

Table 15 compares founders in their post-founding roles relative to their pre-founding cohort. Panel A presents results on how entrepreneurial experience relates to post-founding seniority level. Founders acquire post-founding jobs with 3-4 more years of seniority than their matched pre-founding cohort despite having identical seniority pre-founding. Analogously, Panel B reports results on the post-founding wage level using the pre-founding cohorts. Even compared to pre-founding cohorts with the same seniority, we find that founders have 20-25% higher wages on average. These results are robust to controlling for gender, career length, and education and founder-interaction terms.

We conclude this subsection by considering the founder-specific characteristics that might influence post-founding wage and seniority premia. Accordingly, Table 16 analyzes post-founding outcomes using only the founder sample. We include new controls for firm characteristics applicable only to the founder sample, as well as interaction terms with the failed founder indicator variable. Columns (1)-(4) of Table 16 report results on how founder and firm characteristics might influence post-founding seniority levels. Failed founders land significantly less senior roles than successful founders, the reference group. However, this difference is small relative to the post-founding seniority premium we estimated relative to non-founders. Founders with longer pre-founding careers, more senior pre-founding jobs, or MBAs have significantly higher post-founding seniority. When we include firm or founder characteristics interacted with the failure dummy, we find a positive effect for failing in California, with an estimated coefficient about 60% the magnitude of the negative coefficient on failure. We interpret this as suggestive evidence that failure in California might be associated with a more lenient failure "penalty." Analogously,

29

columns (5)-(8) of Table 16 present regression results on post-founding wage. Both failed and departed founders, on average, receive lower wages post-founding, as do founders with PhDs. However, founders who were funded by top VCs receive a wage premium relative to other founders as do founders with more senior pre-founding roles and longer total careers. Results are similar when we analyze the change from pre- to post-founding seniority and wages.

5 Conclusion

In this paper, we propose a non-pecuniary measure of career achievement, *Seniority*. Based on a database of over 5 million resumes, this metric exploits the variation in job titles and how long they take to attain. In other words, seniority captures a person's standing in an employment hierarchy. These standings facilitate inference about career progression across industries or functional roles—even when stark differences in wages render these sectors or areas of business not directly comparable. As such, the seniority measure offers an important angle when evaluating labor market outcomes, complementing the traditionally used pecuniary measures, such as earnings.

Having validated that seniority captures meaningful variation across people's career trajectories,[15] we use this measure to study employment outcomes of VC-backed entrepreneurs. Thus, we contribute to the literature that has explored self-employment, though mostly in terms of launching organizations of a small-business type as opposed to scalable innovative firms with high-impact potential, such as VC-backed start-ups.

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[15] First, the most common job titles follow a clear pattern. Typical entry-level roles (e.g., "analyst") are more junior, while executive and advisory roles are the most senior. Second, career trajectories by educational attainment follow paths we would expect. Graduates of more prestigious colleges and especially individuals with MBAs outperform other individuals in terms of seniority. Finally, seniority plateaus around 15–20 years into the average career. Relatively few individuals progress to the highest levels of their organization; most reach the middle levels of seniority and remain there.

Using both seniority and wages to measure career progression, we find that founders display accelerated career achievement prior to founding, significantly outperforming contemporaneous graduates of same-tier colleges with similar first jobs. Post-entrepreneurship, founders keep advancing. After exiting their start-ups, they obtain jobs about three years more senior than their pre-founding peers, who are contemporaneous graduates of same-tier colleges with similar jobs right before a start-up's launch. Importantly, while a start-up's success offers a stronger seniority boost to its founder, even failed founders land jobs with higher seniority than those attained by their peers in the meantime. Although we cannot fully eliminate selection concerns, these results do suggest that VC-backed entrepreneurs receive significant benefits when returning to the labor market—even if their venture has not led to an IPO or a high-value acquisition.

Seniority supplements the more standard analysis of wages and unlocks a fuller picture of post-entrepreneurship labor market outcomes. It also is a step toward quantifying non-pecuniary aspects of jobs, commonly considered important in the entrepreneurship literature. While the case of VC-backed entrepreneurs is just one application, we believe the seniority measure may shine a new light on labor market outcomes in a broad range of settings, especially across industries and functional roles.

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Table 1: Founders matched from VentureSource to Emsi

Year	Founders		Percentage matched	Year	Founders		Percentage matched
	Total	Matched			Total	Matched	
1980	1	0	0%	2000	4,306	2,079	48%
1981	2	0	0%	2001	1,579	796	50%
1982	7	1	14%	2002	860	436	51%
1983	5	0	0%	2003	889	498	56%
1984	12	2	17%	2004	983	546	56%
1985	16	3	19%	2005	1,184	644	54%
1986	17	1	6%	2006	1,389	838	60%
1987	38	3	8%	2007	1,696	991	58%
1988	29	5	17%	2008	1,725	1,009	58%
1989	37	8	22%	2009	1,322	800	61%
1990	51	21	41%	2010	1,701	1,055	62%
1991	70	23	33%	2011	2,451	1,550	63%
1992	126	39	31%	2012	2,998	1,930	64%
1993	161	66	41%	2013	3,174	1,988	63%
1994	265	98	37%	2014	3,111	1,792	58%
1995	529	215	41%	2015	2,719	888	33%
1996	1,094	472	43%	2016	5,785	2,460	43%
1997	1,232	549	45%	2017	5,017	2,927	58%
1998	1,613	773	48%	2018	3,011	2,174	72%
1999	3,355	1,691	50%	2019	256	165	64%
Total for 1980–2019					54,820	29,536	54%

The table reports the number and percentage of founders matched from VentureSource (VS) to the Emsi resume data. Founders are considered to enter the VS database when their first start-up receives its first funding.

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Table 2: Summary statistics of the Emsi data

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Job-level variables	Count	Min	Max	Mean	S. Dev.	25th Pct.	Median	75th Pct.
Tenure (years)	19,700,000	0.00	50.00	3.05	3.63	0.83	2.00	4.00
Seniority	20,700,000	-4.00	49.00	6.11	6.28	1.00	4.00	10.00
Estimated wage (median of ONET/Industry)	16,100,000	10,373	245,937	84,569	41,255	52,498	77,401	108,694
Person-level variables	Count	Min	Max	Mean	S. Dev.	25th Pct.	Median	75th Pct.
Career								
Career start	4,515,666	1,950	2,020	2002.52	10.81	1,996	2,005	2,011
Career end	4,999,007	1,950	2,021	2019.23	5.25	2,021	2,021	2,021
Job listed in 2021	5,283,523	0	1	0.81	0.39	1	1	1
Earliest year: pre-1980	4,515,666	0	1	0.04	0.19	0	0	0
Earliest year: 1980-1989	4,515,666	0	1	0.10	0.30	0	0	0
Earliest year: 1990-1999	4,515,666	0	1	0.19	0.39	0	0	0
Earliest year: 2000-2009	4,515,666	0	1	0.37	0.48	0	0	1
Earliest year: 2010-2014	4,515,666	0	1	0.23	0.42	0	0	0
Earliest year: 2015-2020	4,515,666	0	1	0.08	0.27	0	0	0
Total tenure	5,265,608	0	60	11.46	10.71	2.17	9.5	17
Years in data	4,229,069	0	60	16.07	9.99	9	14	22
Total jobs	5,283,523	0	92	3.48	3.38	1	4	6
Seniority								
Max seniority	5,203,010	-4.00	49.00	10.31	6.98	4.00	10.00	15.00
Min seniority	5,203,010	-4.00	49.00	3.35	5.16	-1.00	2.00	5.00
Seniority range	5,203,010	0.00	51.50	6.96	6.82	0.00	5.50	12.00
Wages								
Maximum estimated wage (median)	4,125,645	11,077	245,937	112,012	44,722	76,882	107,298	144,670
Minimum estimated wage (median)	4,125,645	10,373	244,801	63,586	36,236	35,693	54,738	82,266
Range estimated wage (median)	4,125,645	0	224,886	48,425	43,564	5,769	41,716	77,712

The table presents summary statistics for all individuals in the Emsi sample. Tenure is the number of years spent in a role. Seniority, defined precisely in the data section, captures the number of years it takes, on average, to obtain a given job title in a given industry. The career end year is considered to be 2021 if the individual has a job in 2021. Estimated wage is the median wage of the ONET code for a job. Total tenure is the sum of job tenures across an individual's career. Years in data is defined the total time of an individual's career (their last end date minus their first start date). Maximum (minimum) seniority/wage is an individual's maximum (minimum) seniority/wage over the course of their career. Seniority/wage range is the difference between an individual's maximum and minimum seniority/wage.

Table 3: Job titles and their seniority

Panel A: Most common job titles

Rank	Title	Median seniority	Rank	Title	Median seniority
1	intern	-1	11	partner	13
2	owner	13	12	founder	12
3	president	19	13	manager	5
4	research assistant	-1	14	account executive	3
5	project manager	6	15	sales associate	-1
6	associate	4	16	senior project manager	12
7	software engineer	2	17	senior consultant	7
8	chief executive officer	16	18	attorney	8
9	consultant	6	19	director	14
10	vice president	11	20	principal	18

Panel B: Most senior and most junior job titles

Title	Median seniority	Title	Median seniority
professor emeritus	35	dining service worker	-3
ad executive	34	student services supervisor	-3
district governor	33	pool operator	-3
business mentor	32	electrician/helper	-3
president emeritus	31	volleyball camp coach	-3
mediator and arbitrator	30.5	line server	-3
audit committee chair	30	student-athlete mentor	-4
vice president of academic affairs/provost	30	midshipman	-4
audit committee member	30	varsity assistant	-4
dean/professor	30	professorial assistant	-4

The table lists the most common job titles in the Emsi sample (Panel A) and the most senior and the most junior job titles (Panel B). Seniority, defined precisely in the data section, captures the number of years it takes, on average, to obtain a given job title in a given industry. Reported is the median seniority across industries. Titles with fewer than 100 observations are excluded from the Panel B.

Table 4: Employment summary statistics for founders

	Count	Min	Max	Mean	S. Dev.	25th Pct.	Median	75th Pct.
Career summary								
Career start	14,081	1,950	2,018	1,994	9.15	1,988	1,995	2,001
Career end	14,099	1,988	2,021	2,020	3.65	2,021	2,021	2,021
Ongoing job in 2021	14,135	0	1	0.89	0.31	1	1	1
Earliest year: pre-1980	14,081	0	1	0.06	0.23	0	0	0
Earliest year: 1980-1989	14,081	0	1	0.25	0.43	0	0	0
Earliest year: 1990-1999	14,081	0	1	0.41	0.49	0	0	1
Earliest year: 2000-2009	14,081	0	1	0.26	0.44	0	0	1
Earliest year: 2010-2014	14,081	0	1	0.03	0.18	0	0	0
Earliest year: 2015-2020	14,081	0	1	0.00	0.03	0	0	0
Total tenure	13,821	0	60	25.47	11.25	17.00	25.00	33.00
Years in data	14,069	2	59	25.71	9.07	19.00	25.00	32.00
Total jobs	14,106	2	47	7.91	4.10	5.00	7.00	10.00
Seniority								
Pre-founding seniority	13,531	-3.00	37.00	12.11	6.73	6.00	13.00	17.00
Post-founding seniority	13,538	-3.00	36.00	14.65	6.69	12.00	15.00	19.00
Maximum seniority	14,103	0.00	39.00	20.93	4.42	18.00	21.00	24.00
Minimum seniority	14,103	-4.00	26.00	4.38	4.68	1.00	3.00	6.00
Seniority range	14,103	0.00	37.00	16.54	5.84	13.00	17.00	21.00
Weighted mean seniority	14,135	-2.00	35.56	12.35	4.40	9.93	12.67	15.32
Wages								
Maximum estimated wage (median)	14,104	25,864	244,801	185,445	26,839	171,049	193,320	197,249
Minimum estimated wage (median)	14,104	14,842	218,903	72,798	30,714	49,687	70,961	91,653
Range estimated wage (median)	14,104	0.00	224,832	112,647	39,117	87,105	115,616	141,943

The table presents summary statistics for founders in the analysis sample. all individuals in the Emsi sample. These are VS-Emsi matched founders who have at least one pre-founding job and at least one post-founding job listed in the Emsi resume data. Tenure is the number of years spent in a role. Seniority, defined precisely in the data section, captures the number of years it takes, on average, to obtain a given job title in a given industry. The career end year is considered to be 2021 if the individual has a job in 2021. Estimated wage is the median wage of the ONET code for a job. Total tenure is the sum of job tenures across an individual's career. Years in data is defined the total time of an individual's career (their last end date minus their first start date). Weighted mean seniority is an individual's weighted average seniority with weights capturing years spent in each role. Maximum (minimum) seniority/wage is an individual's maximum (minimum) seniority/wage over the course of their career. Seniority/wage range is the difference between an individual's maximum and minimum seniority/wage.

Table 5: Reported Pre- and Post-founding Jobs

	Pre-founding Job Reported	Post-founding Job Reported	Pre- and Post-founding Jobs Reported	Total Founders
All founders	68%	75%	48%	28,738
Jobs Reported by Firm Outcome				
Founders of successful firms	68%	87%	60%	5,289
Founders of failed firms	69%	86%	60%	12,731
Founders who departed active firms	66%	58%	28%	10,718

This table presents the percentage of founders in the matched sample who have pre- and post-founding jobs listed. Successful firms are those that exited with an IPO or an acquisition value that is greater than the total investment amount. Failed firms are firms that went out of business, were acquired for less than total investment, or are listed as active but have not received funding in 3 or more years. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. Many of these founders are currently working at the VC-backed firm.

Table 6: Most common undergraduate and business schools of founders

Rank	Undergraduate institution	Count (%)	MBA institution	Count (%)
1	University of California-Berkeley	374 (3.3%)	Harvard Business School	621 (15.9%)
2	Stanford University	351 (3.1%)	Stanford Graduate School of Business	532 (13.7%)
3	Harvard University	272 (2.4%)	The Wharton School of the University of Pennsylvania	311 (8.0%)
4	Massachusetts Institute of Technology	204 (1.8%)	Northwestern University, Kellogg School of Management	176 (4.5%)
5	Cornell University	202 (1.8%)	MIT Sloan School of Management	151 (3.9%)
6	University of Michigan	196 (1.8%)	UC Berkeley, Haas School of Business	137 (3.5%)
7	University of Pennsylvania	170 (1.5%)	University of Chicago, Booth School of Business	128 (3.3%)
8	The University of Texas at Austin	162 (1.4%)	Columbia Business School	117 (3.0%)
9	University of Illinois at Urbana-Champaign	159 (1.4%)	UCLA Anderson School of Management	88 (2.3%)
10	University of California, Los Angeles	147 (1.3%)	New York University Stern School of Business	73 (1.9%)
11	Princeton University	138 (1.2%)	McCombs School of Business, University of Texas-Austin	63 (1.6%)
12	Brown University	129 (1.2%)	University of Michigan, Ross School of Business	49 (1.3%)
13	University of Washington	126 (1.1%)	Duke University, Fuqua School of Business	45 (1.2%)
14	Carnegie Mellon University	123 (1.1%)	Tuck School of Business	43 (1.1%)
15	Dartmouth College	119 (1.1%)	Pepperdine University	34 (0.9%)
16	Yale University	115 (1.0%)	Santa Clara University	32 (0.8%)
17	Duke University	115 (1.0%)	Carnegie Mellon University	32 (0.8%)
18	Columbia University	111 (1.0%)	Cornell University	28 (0.7%)
19	Brigham Young University	110 (1.0%)	University of Southern California	28 (0.7%)
20	University of Southern California	105 (0.9%)	Boston University	27 (0.7%)
1–20		3,428 (30.6%)		2,715 (69.7%)

The table reports the most common undergraduate and business schools of founders in the analysis sample, which covers those VS-Emsi matched founders who have at least one pre-founding job and at least one post-founding job listed in the Emsi resume data. Shown in the table are the number of founders with an undergraduate or an MBA degree from each school, as a count and as a percentage of all founders with that degree.

Table 7: Education Summary Statistics

	Non-founders	All Founders	Failed Founders	Successful Founders	Founders Who Left Active Firms
Bachelor's degree reported	0.91	0.78	0.77	0.77	0.79
Elite undergraduate degree	0.13	0.18	0.18	0.18	0.18
Master's degree reported (non-MBA)	0.21	0.26	0.26	0.27	0.25
MBA reported	0.09	0.23	0.23	0.24	0.21
Elite MBA	0.02	0.12	0.12	0.13	0.11
PhD reported	0.06	0.16	0.14	0.18	0.18
STEM degree (any kind)	0.56	0.71	0.70	0.74	0.69
Master's STEM degree	0.09	0.20	0.20	0.22	0.19
PhD STEM degree	0.03	0.13	0.13	0.13	0.13
Bachelor's graduation: pre-1980	0.09	0.11	0.12	0.14	0.05
Bachelor's graduation: 1980-1989	0.13	0.29	0.32	0.34	0.16
Bachelor's graduation: 1990-1999	0.17	0.31	0.32	0.30	0.29
Bachelor's graduation: 2000-2009	0.26	0.23	0.21	0.19	0.35
Bachelor's graduation: 2010-2014	0.18	0.05	0.03	0.03	0.12
Bachelor's graduation: 2015-later	0.16	0.01	0.00	0.01	0.03

This table presents the proportion of founders that fall into each education category. Elite undergraduate institutions are defined as Ivy League schools, Stanford, MIT, Northwestern, UC-Berkeley, and Duke. STEM degrees are defined as degrees in the Emsi data that contain keywords for STEM fields of study. Emsi data identify master's and PhD degrees as well as bachelor's degrees graduation dates. Elite MBA programs are defined as Harvard, Northwestern, UChicago, Stanford, and Wharton.

Table 8: Most common titles of founders in labor force entry, pre-founding, and post-founding jobs

Rank	Labor force entry title	Count (%)	Pre-founding title	Count	Post-founding title	Count (%)
1	Software Engineer	802 (9.2%)	Vice President	1,305 (10.0%)	Chief Executive Officer	1,608 (12.5%)
2	Associate	324 (3.7%)	Chief Executive Officer	941 (7.2%)	Vice President	1,133 (8.8%)
3	Analyst	243 (2.8%)	Chief Technology Officer	337 (2.6%)	Director	596 (4.6%)
4	Engineer	233 (2.7%)	Director	310 (2.4%)	Chief Technology Officer	488 (3.8%)
5	Software Developer	195 (2.2%)	President	198 (1.5%)	President	254 (2.0%)
6	Research Associate	113 (1.3%)	Consultant	173 (1.3%)	Advisor	251 (1.9%)
7	Business Analyst	97 (1.1%)	Software Engineer	165 (1.3%)	Chairman	167 (1.3%)
8	Senior Associate	95 (1.1%)	Senior Software Engineer	133 (1.0%)	Principal	147 (1.1%)
9	Account Executive	94 (1.1%)	Entrepreneur-in-Residence	102 (0.8%)	Consultant	129 (1.0%)
10	Investment Banking Analyst	94 (1.1%)	Chairman	101 (0.8%)	Managing Director	128 (1.0%)
11	Programmer	89 (1.0%)	Principal	98 (0.8%)	Entrepreneur-in-Residence	116 (0.9%)
12	Web Developer	88 (1.0%)	Senior Vice President	92 (0.7%)	Partner	113 (0.9%)
13	Systems Engineer	88 (1.0%)	Associate	92 (0.7%)	Chief Operations Officer	112 (0.9%)
14	Financial Analyst	76 (0.9%)	Partner	89 (0.7%)	Senior Vice President	110 (0.9%)
15	Developer	75 (0.9%)	Product Manager	89 (0.7%)	Managing Partner	94 (0.7%)
16	Researcher	73 (0.8%)	Managing Director	87 (0.7%)	Software Engineer	90 (0.7%)
17	Design Engineer	71 (0.8%)	Advisor	85 (0.7%)	Owner	88 (0.7%)
18	Research Engineer	60 (0.7%)	Director of Business Development	80 (0.6%)	Advisory Board Member	81 (0.6%)
19	Associate Consultant	56 (0.6%)	Chief Operations Officer	79 (0.6%)	Senior Software Engineer	78 (0.6%)
20	Research Fellow	50 (0.6%)	Executive Vice President	76 (0.6%)	Mentor	77 (0.6%)
1–20		3,066 (34.5%)		4,632 (35.7%)		5,860 (45.5%)

The table reports the most common titles held by founders at labor-force entry and in their pre- and post-founding jobs. Shown in the table are the number of founders with each title, as a count and as a percentage of all founders.

Table 9: Seniority in the Pre-founding Job Summary Statistics

Panel A: Seniority

	Count	Mean	S.D.	25th Percentile	Median	75th Percentile
All founders	13,232	12.03	6.76	6.00	12.00	17.00
Seniority by outcome:						
Founders of successful firms	3,052	12.37	6.64	7.00	13.00	17.25
Founders of failed firms	7,326	11.94	6.66	6.00	12.00	17.00
Founders who departed active firms	2,853	11.89	7.11	6.00	12.00	17.00
Seniority by firm start year:						
Firm start: 1990-1994	99	12.40	6.36	8.00	12.00	17.00
Firm start: 1995-1999	1,979	12.34	6.29	7.00	13.00	17.00
Firm start: 2000-2004	2,433	12.45	6.21	7.00	13.00	17.00
Firm start: 2005-2009	2,450	13.02	6.71	7.00	13.00	18.00
Firm start: 2010-2014	4,128	11.16	6.95	5.00	12.00	16.00
Firm start: 2015-2019	2,139	11.79	7.26	5.00	12.00	17.00

Panel B: Seniority Percentile

	Count	Mean	S.D.	25th Percentile	Median	75th Percentile
All founders	10,962	69.21	27.11	52.21	78.30	91.40
Seniority by outcome:						
Founders of successful firms	2,567	69.94	26.54	53.46	78.82	91.62
Founders of failed firms	6,113	69.09	26.93	52.36	78.05	90.92
Founders who departed active firms	2,281	68.75	28.18	50.41	78.26	92.33
Seniority by firm start year:						
Firm start: 1990-1994	84	63.37	27.46	41.84	66.75	89.37
Firm start: 1995-1999	1,680	69.45	25.84	53.83	77.73	90.52
Firm start: 2000-2004	2,091	69.11	26.18	53.60	77.80	89.94
Firm start: 2005-2009	2,083	71.31	26.51	55.81	80.86	92.38
Firm start: 2010-2014	3,299	68.57	27.82	50.09	78.00	91.62
Firm start: 2015-2019	1,721	68.14	28.57	49.39	77.92	92.29

The table reports founder percentile in the pre-founding job. Panel A reports summary statistics for seniority value. Panel B reports summary statistics for seniority percentile rank within cohort. In this table, cohorts are defined as all individuals who graduated college and entered the labor force in the same year. Cohorts are constructed using resumes of graduates of our sample of universities. The pre-founding job is the job held immediately before the entrepreneurial firm. This table includes only founders who have both a pre- and post-founding job identified in their work history.

Table 10: Pre-founding Seniority and Wage — Labor Force Entry Cohort

Panel A: Pre-founding Seniority

	(1)	(2)	(3)
Successful Founder	4.562***	4.619***	4.532***
	(0.181)	(0.181)	(0.352)
Failed Founder	4.355***	4.409***	4.320***
	(0.112)	(0.111)	(0.318)
Departed Founder	4.108***	4.163***	4.072***
	(0.173)	(0.173)	(0.335)
Cohort Year		-0.171***	-0.179***
		(0.005)	(0.005)
Male			0.356***
			(0.009)
Founder × Male			0.649**
			(0.282)
STEM			-0.154***
			(0.009)
Founder × STEM			-0.428**
			(0.195)
Elite Undergrad			0.390***
			(0.044)
Founder × Elite Undergrad			-1.060***
			(0.201)
MBA			0.970***
			(0.019)
Founder × MBA			-0.193
			(0.279)
Elite MBA			0.730***
			(0.035)
Founder × Elite MBA			-0.773**
			(0.358)
Has a PhD			-0.0768**
			(0.031)
Founder × PhD			-0.0979
			(0.258)
Cohort FE	Y	Y	Y
Observations	3,902,886	3,902,886	3,264,306
Adjusted R-squared	0.343	0.345	0.354

Panel B: Pre-founding Wage

	(1)	(2)	(3)
Successful Founder	0.305***	0.311***	0.396***
	(0.0117)	(0.0117)	(0.0225)
Failed Founder	0.265***	0.271***	0.354***
	(0.0076)	(0.0076)	(0.0209)
Departed Founder	0.273***	0.279***	0.361***
	(0.0114)	(0.0114)	(0.0216)
Cohort Year		-0.0173***	-0.0174***
		(0.0005)	(0.0005)
Male			0.100***
			(0.0010)
Founder × Male			-0.0496***
			(0.0190)
STEM			0.0785***
			(0.0014)
Founder × STEM			-0.0628***
			(0.0128)
Elite Undergrad			0.0299***
			(0.0038)
Founder × Elite Undergrad			-0.0694***
			(0.0141)
MBA			0.0804***
			(0.0011)
Founder × MBA			-0.0323*
			(0.0177)
Elite MBA			0.0830***
			(0.0020)
Founder × Elite MBA			-0.113***
			(0.0225)
Has a PhD			-0.0948***
			(0.0041)
Founder × PhD			-0.0189
			(0.0179)
Cohort FE	Y	Y	Y
Observations	4,330,149	4,330,149	3,688,526
Adjusted R-squared	0.225	0.227	0.257

This table presents OLS regression results where pre-founding seniority (Panel A) and log wage (Panel B) are regressed onto founder status and characteristics. Departed founder refers to founders who left active and private firms. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. The sample includes founders and his or her labor force non-founder cohort. Standard errors are in parentheses and are clustered at the cohort level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 11: Seniority Before and After Founding Experience

	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
All founders:								
Seniority difference	12,750	2.54	8.36	-8.00	-3.00	2.00	8.00	13.00
Seniority in post-founding job	12,750	14.55	6.75	4.00	11.00	15.00	19.00	23.00
Seniority in pre-founding job	12,750	12.01	6.77	3.00	6.00	12.00	17.00	21.00
Time working at start up job	10,955	5.24	3.58	2.00	3.00	4.00	7.00	10.00
Founders of failed firms:								
Seniority difference	7,045	2.39	8.22	-8.00	-3.00	2.00	8.00	13.00
Seniority in post-founding job	7,045	14.28	6.64	4.00	10.50	15.00	19.00	23.00
Seniority in pre-founding job	7,045	11.9	6.68	3.00	6.00	12.00	17.00	20.00
Time working at start up job	6,529	5.00	3.36	2.00	3.00	4.00	6.00	9.00
Founders of active firms:								
Seniority difference	2,769	2.31	8.59	-9.00	-3.00	2.00	8.00	13.00
Seniority in post-founding job	2,769	14.21	7.17	4.00	10.00	14.00	19.00	23.00
Seniority in pre-founding job	2,769	11.91	7.10	2.00	6.00	12.00	17.00	21.50
Time working at start up job	1,710	4.60	3.24	1.00	2.00	4.00	6.00	9.00
Founders of successful firms:								
Seniority difference	2,935	3.14	8.47	-8.00	-2.00	2.00	9.00	14.00
Seniority in post-founding job	2,935	15.51	6.50	5.00	12.00	16.00	20.00	23.00
Seniority in pre-founding job	2,935	12.37	6.65	3.00	7.00	13.00	17.00	21.00
Time working at start up job	2,715	6.22	4.06	2.00	3.00	5.00	8.00	12.00

This table characterizes how seniority changes after founding experience at a VC-backed start up. Summary statistics for seniority levels at founders' jobs immediately before and after founding are reported as "Seniority in pre-founding job" and "Seniority in post-founding job" respectively. Seniority difference is the difference between a founder's seniority in their immediate post-founding job and their seniority in their immediate pre-founding job. Time working at start up job is the number of years that a founder spends working as the founder of a VC-backed firm before leaving for a post-founding job. The definitions of failed, successful, and active firms follow definitions used throughout the paper. Seniority is measured in years.

Table 12: Observable Characteristics and Seniority Differences

Panel A: All Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	2,757	2.81	8.65	-8.50	-3.00	2.50	9.00	14.00	0.3
MBA = 0	9,650	2.51	8.31	-8.00	-2.50	2.00	8.00	13.00	
STEM degree = 1	8,787	2.69	8.34	-8.00	-2.00	2.50	8.00	13.00	0.39
STEM degree = 0	3,620	2.30	8.50	-9.00	-3.00	2.00	8.00	13.50	
Elite undergraduate education = 1	2,186	3.18	8.63	-8.00	-2.00	3.00	9.00	15.00	0.73
Elite undergraduate education = 0	10,221	2.45	8.33	-8.00	-3.00	2.00	8.00	13.00	
Great recession start = 1	1,540	1.94	8.32	-9.00	-3.00	2.00	7.25	12.75	-0.69
Great recession start = 0	11,210	2.63	8.37	-8.00	-2.50	2.00	8.00	13.00	
Dot-com start = 1	2,415	3.02	7.91	-7.00	-2.00	3.00	8.00	13.00	0.59
Dot-com start = 0	10,335	2.43	8.46	-8.50	-3.00	2.00	8.00	13.00	
Firm in CA or MA = 1	6,853	2.64	8.37	-8.00	-2.00	2.50	8.00	13.00	0.21
Firm in CA or MA = 0	5,897	2.43	8.36	-8.00	-3.00	2.00	8.00	13.00	
Firm in IT = 1	5,346	2.73	8.18	-8.00	-2.00	2.50	8.00	13.00	0.32
Firm in IT = 0	7,401	2.41	8.50	-9.00	-3.00	2.00	8.00	13.00	
Top VC = 1	3,072	2.76	8.57	-8.00	-3.00	3.00	9.00	14.00	0.28
Top VC = 0	9,651	2.48	8.30	-8.00	-3.00	2.00	8.00	13.00	

Panel B: Successful Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	639	3.77	8.95	-8.00	-2.00	3.50	10.00	16.00	0.79
MBA = 0	2,138	2.98	8.34	-8.00	-2.00	3.00	9.00	14.00	
STEM degree = 1	2,058	3.30	8.36	-8.00	-2.00	3.00	9.00	14.50	0.52
STEM degree = 0	719	2.78	8.84	-9.00	-3.00	3.00	9.00	15.00	
Elite undergraduate education = 1	486	4.32	8.94	-8.00	-1.00	4.00	11.00	16.00	1.4
Elite undergraduate education = 0	2,291	2.92	8.37	-8.00	-2.00	3.00	9.00	14.00	
Great recession start = 1	373	2.09	8.53	-9.00	-3.00	1.50	8.00	14.00	-1.2
Great recession start = 0	2,562	3.29	8.46	-8.00	-2.00	3.00	9.00	14.50	
Dot-com start = 1	597	4.00	7.97	-6.00	-1.00	4.00	9.50	14.00	1.08
Dot-com start = 0	2,338	2.92	8.58	-8.00	-2.00	3.00	9.00	14.50	
Firm in CA or MA = 1	1,669	3.19	8.46	-8.00	-2.00	3.00	9.00	14.50	0.11
Firm in CA or MA = 0	1,266	3.08	8.49	-8.00	-2.00	3.00	9.00	14.00	
Firm in IT = 1	1,334	3.11	8.11	-7.00	-2.00	3.00	9.00	14.00	-0.06
Firm in IT = 0	1,601	3.17	8.77	-8.50	-2.00	3.00	9.00	15.00	
Top VC = 1	934	3.48	8.68	-8.00	-2.00	3.75	9.50	15.00	0.51
Top VC = 0	2,000	2.97	8.36	-8.00	-2.00	3.00	9.00	14.00	

Panel C: Failed Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	1,526	2.73	8.43	-8.00	-3.00	2.00	8.50	14.00	0.43
MBA = 0	5,180	2.30	8.19	-8.00	-3.00	2.00	8.00	13.00	
STEM degree = 1	4,701	2.42	8.18	-8.00	-3.00	2.00	8.00	13.00	0.07
STEM degree = 0	2,005	2.35	8.39	-8.00	-3.00	2.00	8.00	14.00	
Elite undergraduate education = 1	1,182	2.92	8.51	-8.00	-2.00	2.00	9.00	14.00	0.63
Elite undergraduate education = 0	5,524	2.29	8.18	-8.00	-3.00	2.00	8.00	13.00	
Great recession start = 1	1,064	1.89	8.24	-9.00	-3.00	2.00	7.00	12.00	-0.59
Great recession start = 0	5,981	2.48	8.21	-8.00	-3.00	2.00	8.00	13.00	
Dot-com start = 1	1,792	2.70	7.86	-7.50	-2.00	2.00	8.00	13.00	0.42
Dot-com start = 0	5,253	2.28	8.33	-8.50	-3.00	2.00	8.00	13.00	
Firm in CA or MA = 1	3,806	2.48	8.16	-8.00	-2.50	2.00	8.00	13.00	0.21
Firm in CA or MA = 0	3,239	2.27	8.29	-8.50	-3.00	2.00	8.00	13.00	
Firm in IT = 1	3,150	2.56	7.99	-8.00	-2.00	2.00	8.00	13.00	0.31
Firm in IT = 0	3,894	2.25	8.40	-9.00	-3.00	2.00	8.00	13.00	
Top VC = 1	1,471	2.44	8.42	-8.00	-3.00	2.00	8.00	13.00	0.05
Top VC = 0	5,552	2.39	8.16	-8.00	-3.00	2.00	8.00	13.00	

Panel D: Departed Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	538	2.02	8.69	-9.00	-4.00	2.00	8.00	13.00	-0.47
MBA = 0	2,111	2.49	8.58	-8.50	-3.00	2.00	8.00	13.00	
STEM degree = 1	1,837	2.68	8.66	-9.00	-3.00	3.00	8.00	13.50	0.92
STEM degree = 0	812	1.76	8.43	-9.00	-4.00	1.50	7.00	12.00	
Elite undergraduate education = 1	466	2.77	8.45	-9.00	-3.00	3.00	8.00	13.50	0.45
Elite undergraduate education = 0	2,183	2.32	8.63	-9.00	-3.00	2.00	8.00	13.00	
Great recession start = 1	103	1.91	8.57	-8.00	-4.00	1.00	9.00	13.00	-0.41
Great recession start = 0	2,666	2.32	8.59	-9.00	-3.00	2.00	8.00	13.00	
Firm in CA or MA = 1	1,377	2.42	8.80	-9.00	-3.00	2.00	8.00	13.00	0.22
Firm in CA or MA = 0	1,392	2.20	8.38	-8.00	-3.00	2.00	8.00	13.00	
Firm in IT = 1	862	2.76	8.90	-8.50	-3.00	3.00	9.00	14.00	0.66
Firm in IT = 0	1,905	2.10	8.44	-9.00	-3.00	2.00	8.00	13.00	
Top VC = 1	667	2.44	8.68	-9.00	-3.00	2.00	8.00	13.00	0.18
Top VC = 0	2,098	2.26	8.56	-9.00	-3.00	2.00	8.00	13.00	

Table 12 summarizes how various founder and firm characteristics may account for variation in post-founding seniority differences (post-founding minus pre-founding seniority) within different subgroups of VC-backed founders. Panel A considers how observable characteristics might explain heterogeneity in post-founding seniority differences for *all* founders in our sample, Panel B focuses on founders who start successful firms ("successful founders"), Panel C focuses on founders who start failed firms ("failed founders"), and Panel D focuses on founders who start firms that are still active ("departed founders"). A firm is classified as successful if it has exited via IPO or was acquired for more than total investment. A firm is classified as failed if it is not successful and has not received VC funding in the 3 most recent years in our sample. Lastly, a firm is classified as still active if it is neither successful nor failed and has received VC funding within the 3 most recent years in our sample.

All observable characteristics/variables by which founders within each group are sorted are binary indicators. Education variables (MBA, STEM, and elite undergraduate education) come from the Emsi resume data. Firm-level come from the VS data, and they indicate whether a firm was founded (i) at the start of the great recession (Great Recession Start), (ii) at the start of the Dot-com bubble (Dot-com start), (iii) in California or Massachusetts (Firm in CA or MA), and/or (iv) in the IT industry (Firm in IT). Finally, "Top VC" indicates whether a portfolio firm received funding from a top VC, defined as a VC firm in the top percentile of number of investments made over the prior 10 years. Panel D does not sort founders by Dot-com start because no firms established at the start of the Dot-com bubble remain classified as "still active" in our sample.

Table 13: Wages Before and After Founding Experience

	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
All founders								
Wage difference	10,994	11,816	59,085	-65,583	-24,159	11,594	51,125	88,718
Wage in post-founding job	10,994	135,252	46,862	70,624	100,061	138,660	178,049	194,883
Wage in pre-founding job	10,994	123,436	42,382	70,598	93,436	121,172	153,323	183,803
Time working at start up job	9,632	5.17	3.49	2.00	3.00	4.00	7.00	10.00
Founders of failed firms								
Wage difference	6,199	12,061	57,649	-62,631	-22,903	11,727	50,042	87,413
Wage in post-founding job	6,199	134,873	45,801	73,061	100,542	137,709	176,492	194,605
Wage in pre-founding job	6,199	122,813	41,513	71,677	94,055	120,846	151,876	178,672
Time working at start up job	5,811	4.92	3.25	2.00	3.00	4.00	6.00	9.00
Founders of active firms								
Wage difference	2,245	9,314	64,323	-76,868	-31,915	8,039	52,764	93,982
Wage in post-founding job	2,245	131,391	50,569	63,811	92,880	129,868	185,950	196,351
Wage in pre-founding job	2,245	122,077	45,725	63,484	88,809	116,731	152,736	192,314
Time working at start up job	1,442	4.64	3.27	1.00	2.00	4.00	6.00	9.00
Founders of successful firms								
Wage difference	2,549	13,433	57,663	-63,482	-20,520	13,954	52,583	88,437
Wage in post-founding job	2,549	139,592	45,675	73,658	105,228	145,035	181,408	194,772
Wage in pre-founding job	2,549	126,159	41,305	74,152	96,574	126,446	156,207	181,695
Time working at start up job	2,378	6.11	3.99	2.00	3.00	5.00	8.00	11.00

This table characterizes how wages change after founding experience at a VC-backed start up. Summary statistics for estimated wages at founders' jobs immediately before and after founding are reported as "Wage in pre-founding job" and "Wage in post-founding job" respectively. Wage difference is the difference between a founder's estimated wage in their immediate post-founding job and their estimated wage in their immediate pre-founding job. Time working at start up job is the number of years working as the founder of a VC-backed firm before leaving for the post-founding role. Definition of failed, successful, and still active firms follow definitions used throughout the paper. Wages are measured in US dollars.

Table 14: Observable Characteristics and Wage Differences

Panel A: All Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	2,380	8,835	59,467	-68,334	-27,281	11,690	49,856	85,781	-3,838
MBA = 0	8,074	12,673	58,854	-64,170	-23,405	11,621	51,613	89,981	
STEM degree = 1	7,419	12,459	57,882	-63,000	-22,584	11,690	51,222	88,397	2,273
STEM degree = 0	3,035	10,186	61,672	-70,308	-27,241	10,227	51,529	89,791	
Elite undergraduate education = 1	1,759	12,288	60,251	-65,262	-22,994	11,690	52,037	90,911	588
Elite undergraduate education = 0	8,695	11,701	58,763	-65,324	-24,849	11,531	51,014	88,359	
Great recession start = 1	1,342	11,840	60,541	-67,059	-26,644	11,690	52,051	91,169	27
Great recession start = 0	9,652	11,813	58,882	-65,299	-23,656	11,517	51,041	88,501	
Dot-com start = 1	2,207	16,950	52,749	-50,731	-14,438	11,690	51,482	87,093	6,423
Dot-com start = 0	8,787	10,527	60,506	-68,424	-26,893	10,332	51,042	89,521	
Firm in CA or MA = 1	5,911	12,631	58,384	-64,720	-23,114	11,690	51,639	88,501	1,761
Firm in CA or MA = 0	5,083	10,870	59,881	-66,944	-25,720	10,327	50,380	89,075	
Firm in IT = 1	4,693	12,835	54,474	-57,790	-18,444	11,690	48,983	83,054	1,791
Firm in IT = 0	6,298	11,044	62,298	-70,682	-28,286	10,447	53,488	92,872	
Top VC = 1	2,595	13,497	57,651	-60,687	-20,066	13,273	51,838	87,863	2,244
Top VC = 0	8,377	11,252	59,482	-67,228	-25,851	11,205	50,930	89,062	

Panel B: Successful Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	557	13,103	56,552	-61,572	-24,038	13,670	54,179	87,754	-669
MBA = 0	1,845	13,772	57,998	-63,938	-19,669	14,268	52,793	88,501	
STEM degree = 1	1,786	14,010	57,165	-61,507	-19,193	14,617	52,793	88,217	1,532
STEM degree = 0	616	12,477	59,084	-66,997	-23,862	12,943	53,774	89,895	
Elite undergraduate education = 1	408	11,860	58,549	-61,355	-20,160	9,213	53,084	88,397	-2,116
Elite undergraduate education = 0	1,994	13,976	57,478	-63,864	-20,753	14,967	53,052	88,217	
Great recession start = 1	313	9,810	61,852	-71,340	-28,253	13,670	52,450	91,650	-4,130
Great recession start = 0	2,236	13,940	57,049	-61,821	-19,016	14,060	52,615	88,217	
Dot-com start = 1	521	18,958	51,469	-46,464	-10,275	19,312	53,516	85,785	6,944
Dot-com start = 0	2,028	12,014	59,078	-67,199	-23,840	12,666	52,496	89,034	
Firm in CA or MA = 1	1,451	13,826	56,440	-61,536	-19,193	14,268	51,838	87,093	913
Firm in CA or MA = 0	1,098	12,913	59,263	-66,012	-22,690	13,670	52,912	91,325	
Firm in IT = 1	1,173	14,933	52,970	-53,281	-16,210	16,339	50,344	82,159	2,779
Firm in IT = 0	1,376	12,154	61,372	-70,171	-26,678	11,574	54,819	93,408	
Top VC = 1	792	15,916	56,153	-61,171	-14,981	16,107	54,027	87,198	3,533
Top VC = 0	1,756	12,383	58,257	-64,484	-24,305	13,166	51,539	88,721	

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Panel C: Failed Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	1,372	8,901	58,504	-67,228	-27,049	9,835	48,608	83,809	-4,003
MBA = 0	4,535	12,903	57,404	-60,661	-22,044	11,707	50,380	88,131	
STEM degree = 1	4,156	12,233	56,394	-59,433	-21,961	11,404	49,641	86,834	874
STEM degree = 0	1,751	11,359	60,639	-67,924	-25,804	11,531	52,204	89,791	
Elite undergraduate education = 1	983	12,908	59,961	-64,876	-22,201	11,623	51,782	92,810	1,121
Elite undergraduate education = 0	4,924	11,787	57,219	-61,891	-23,385	11,351	49,802	86,579	
Great recession start = 1	941	11,897	59,171	-64,046	-25,947	11,575	49,832	86,720	-193
Great recession start = 0	5,258	12,090	57,378	-62,223	-22,044	11,732	50,072	87,413	
Dot-com start = 1	1,663	16,185	53,224	-50,856	-15,582	14,586	50,658	87,438	5,637
Dot-com start = 0	4,536	10,548	59,122	-66,278	-25,461	10,627	49,863	87,329	
Firm in CA or MA = 1	3,344	12,910	57,312	-63,311	-21,354	12,971	50,796	87,984	1,844
Firm in CA or MA = 0	2,855	11,066	58,035	-61,741	-24,023	10,383	49,237	86,738	
Firm in IT = 1	2,832	12,523	54,079	-56,370	-19,180	12,229	48,123	82,316	850
Firm in IT = 0	3,366	11,674	60,502	-67,117	-25,851	11,387	53,088	91,342	
Top VC = 1	1,263	12,807	55,584	-56,370	-20,067	12,832	48,266	85,317	1,009
Top VC = 0	4,918	11,798	58,152	-64,516	-23,913	11,552	50,640	87,705	

Panel D: Departed Founders

Indicator variable	Count	Mean	SD	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	Mean difference (e.g., MBA - No MBA)
MBA = 1	451	3,364	65,297	-84,831	-42,549	7,643	48,331	82,341	-7,507
MBA = 0	1,693	10,871	63,451	-73,890	-30,309	7,904	53,262	95,594	
STEM degree = 1	1,477	11,223	62,681	-73,890	-29,360	9,074	54,343	94,981	6,207
STEM degree = 0	667	5,015	66,373	-79,853	-39,034	5,252	47,690	89,726	
Elite undergraduate education = 1	368	11,107	62,966	-68,222	-26,274	6,541	51,663	89,465	2,192
Elite undergraduate education = 0	1,776	8,915	64,105	-76,623	-33,563	7,974	52,494	94,327	
Great recession start = 1	88	18,455	69,904	-79,424	-26,746	22,109	66,813	106,965	9,513
Great recession start = 0	2,157	8,942	64,075	-76,868	-32,257	7,651	52,019	92,872	
Firm in CA or MA = 1	1,115	10,254	63,815	-74,218	-31,187	8,848	54,343	94,400	1,866
Firm in CA or MA = 0	1,130	8,388	64,836	-79,789	-32,671	7,299	51,223	92,649	
Firm in IT = 1	688	10,540	58,440	-66,494	-21,879	8,564	50,277	87,726	1,831
Firm in IT = 0	1,555	8,709	66,784	-79,853	-35,982	7,670	54,418	96,899	
Top VC = 1	540	11,562	64,191	-71,273	-29,511	8,680	57,962	97,321	3,042
Top VC = 0	1,702	8,520	64,308	-78,274	-32,852	7,921	51,460	92,285	

Table 14 summarizes how various founder and firm characteristics may account for variation in post-founding wage differences (post-founding minus pre-founding wages) within different subgroups of VC-backed founders. Panel A considers how observable characteristics might explain heterogeneity in post-founding wage differences for *all* founders in our sample, Panel B focuses on founders who start successful firms ("successful founders"), Panel C focuses on founders who start failed firms ("failed founders"), and Panel D focuses on founders who start firms that are still active ("departed founders"). A firm is classified as successful if it has exited via IPO or was acquired for more than total investment. A firm is classified as failed if it is not successful and has not received VC funding in the 3 most recent years in our sample. Lastly, a firm is classified as still active if it is neither successful nor failed and has received VC funding within the 3 most recent years in our sample.

All observable characteristics/variables by which founders within each group are sorted are binary indicators. Education variables (MBA, STEM, and elite undergraduate education) come from the Emsi resume data. Firm-level come from the VS data, and they indicate whether a firm was founded (i) at the start of the great recession (Great Recession Start), (ii) at the start of the Dot-com bubble (Dot-com start), (iii) in California or Massachusetts (Firm in CA or MA), and/or (iv) in the IT industry (Firm in IT). Finally, "Top VC" indicates whether a portfolio firm received funding from a top VC, defined as a VC firm in the top percentile of number of investments made over the prior 10 years. Panel D does not sort founders by Dot-com start because no firms established at the start of the Dot-com bubble remain classified as "still active" in our sample.

Table 15: Post-founding Seniority and Wage — Pre-founding Cohort

Panel A: Post-founding Seniority

	(1)	(2)	(3)
Successful Founder	3.348***	3.364***	3.789***
	(0.142)	(0.142)	(0.314)
Failed Founder	2.789***	2.805***	3.219***
	(0.095)	(0.095)	(0.295)
Departed Founder	3.471***	3.484***	3.882***
	(0.159)	(0.159)	(0.315)
Years After Graduation		0.134***	0.138***
		(0.004)	(0.004)
Male			0.419***
			(0.009)
Founder × Male			-0.435
			(0.270)
STEM			-0.0801***
			(0.008)
Founder × STEM			-0.12
			(0.167)
Elite Undergrad			0.357***
			(0.042)
Founder × Elite Undergrad			0.148
			(0.178)
MBA			0.945***
			(0.017)
Founder × MBA			-0.328
			(0.226)
Elite MBA			0.909***
			(0.026)
Founder × Elite MBA			-0.513*
			(0.295)
Has a PhD			0.303***
			(0.032)
Founder × PhD			-0.319
			(0.208)
Cohort FE	Y	Y	Y
Observations	4,606,651	4,606,465	3,827,325
Adjusted R-squared	0.500	0.501	0.503

Panel B: Post-founding Wage

	(1)	(2)	(3)
Successful Founder	0.211***	0.212***	0.254***
	(0.0096)	(0.0096)	(0.0219)
Failed Founder	0.189***	0.190***	0.232***
	(0.0061)	(0.0061)	(0.0206)
Departed Founder	0.180***	0.181***	0.217***
	(0.0115)	(0.0115)	(0.0221)
Years After Graduation		0.00831***	0.00803***
		(0.0003)	(0.0003)
Male			0.0879***
			(0.0008)
Founder × Male			-0.0187
			(0.0188)
STEM			0.0464***
			(0.0012)
Founder × STEM			-0.0356***
			(0.0112)
Elite Undergrad			0.0150***
			(0.0035)
Founder × Elite Undergrad			-0.0509***
			(0.0120)
MBA			0.0718***
			(0.0013)
Founder × MBA			-0.0874***
			(0.0153)
Elite MBA			0.0649***
			(0.0016)
Founder × Elite MBA			-0.0463**
			(0.0202)
Has a PhD			-0.0254***
			(0.0035)
Founder × PhD			0.0193
			(0.0143)
Cohort FE	Y	Y	Y
Observations	5,273,989	5,273,795	4,482,815
Adjusted R-squared	0.270	0.270	0.282

This table presents OLS regression results where post-founding seniority (Panel A) and log wage (Panel B) are regressed onto founder status and characteristics. Departed founder refers to founders who left active and private firms. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. The sample includes founders and his or her pre-founding non-founder cohort. Standard errors are in parentheses and are clustered at the cohort level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 16: Post-founding Seniority and Wage — Founder Sample

	Post-founding Seniority				Post-founding Wage			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Failed Founder	-0.949***	-0.739***	-0.695***	-0.861***	-0.0354***	-0.0292***	-0.0271**	-0.0370**
	(0.142)	(0.147)	(0.149)	(0.212)	(0.0098)	(0.0104)	(0.0106)	(0.0153)
Departed Founder	-0.878***	-0.225	-0.155	-0.171	-0.0891***	-0.0665***	-0.0603***	-0.0610***
	(0.181)	(0.196)	(0.198)	(0.198)	(0.0129)	(0.0144)	(0.0146)	(0.0147)
Pre-founding Seniority		0.175***	0.168***	0.168***		0.00410***	0.00368***	0.00365***
		(0.010)	(0.010)	(0.010)		(0.0007)	(0.0007)	(0.0007)
Years After Graduation		0.0910***	0.0948***	0.0947***		0.00340***	0.00377***	0.00380***
		(0.007)	(0.007)	(0.007)		(0.0005)	(0.0005)	(0.0005)
STEM Degree			-0.283*	-0.284*			0.0200*	0.0203*
			(0.145)	(0.145)			(0.0104)	(0.0104)
Elite Undergrad			0.0976	0.173			-0.00661	-0.0151
			(0.166)	(0.251)			(0.0115)	(0.0183)
MBA			0.984***	1.085***			0.00293	0.0256
			(0.189)	(0.280)			(0.0138)	(0.0210)
Elite MBA			0.547**	0.457			0.0228	-0.0142
			(0.254)	(0.388)			(0.0184)	(0.0296)
PhD			-0.0927	-0.0899			-0.0575***	-0.0575***
			(0.177)	(0.177)			(0.0127)	(0.0127)
Firm in CA			0.0198	-0.261			0.0118	-0.00629
			(0.126)	(0.193)			(0.0089)	(0.0141)
Top VC			0.138	0.168			0.0251**	0.0369**
			(0.147)	(0.209)			(0.0103)	(0.0151)
Failed × MBA				-0.186				-0.0402
				(0.376)				(0.0275)
Failed × Elite MBA				0.17				0.0648*
				(0.513)				(0.0376)
Failed × Elite Undergrad				-0.14				0.0143
				(0.332)				(0.0233)
Failed × Firm in CA				0.504**				0.0325*
				(0.253)				(0.0180)
Failed × Top VC				-0.0565				-0.0221
				(0.292)				(0.0205)
Observations	11,507	10,520	10,240	10,240	10,712	9,739	9,478	9,478
Adjusted R-squared	0.004	0.083	0.093	0.093	0.005	0.027	0.03	0.031

This table presents OLS regressions relating post-founding seniority (Columns 1–4) and post-founding log wages (Columns 5–8) to founder status and characteristics. Departed founder refers to founders who left active and private firms. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. Standard errors are in parentheses and are clustered at the cohort level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix Table 1: Elite and Tier-2 universities

Elite universities	Tier 2 universities
Brown University	Amherst College
Columbia University	**Boston University**
Cornell University	**Georgetown University**
Dartmouth College	**Johns Hopkins University**
Duke University	Macalester College
Harvard University	New York University
Massachusetts Institute of Technology	**Northeastern University**
Northwestern University	Pomona College
Princeton University	**Rice University**
Stanford University	**Tufts University**
University of California, Berkeley	University of California - San Diego
University of Chicago	**University of Michigan**
University of Pennsylvania	**University of North Carolina at Chapel Hill**
Yale University	**University of Southern California**
	University of Virginia
	Vanderbilt University
	Wesleyan University
	Williams College

The table presents the elite and tier-2 classification of colleges. Bold font represents institutions included in the core sample of 44 colleges.

Appendix Table 2: List of colleges in the core Emsi dataset

1	Boston University	23	Stanford University
2	Brigham and Young University	24	Syracuse University
3	Brown University	25	Texas A&M University
4	Colgate University	26	Tufts University
5	Colorado University	27	U. of Arizona
6	Columbia University	28	U. of California (Berkeley)
7	Cornell University	29	U. of California (Davis)
8	Dartmouth College	30	U. of California (Los Angeles)
9	Duke University	31	U. of Florida
10	Georgetown University	32	U. of Illinois (Urbana-Champaign)
11	Georgia Institute of Technology	33	U. of Maryland (College Park)
12	Harvard University	34	U. of Michigan
13	Indiana University	35	U. of Minnesota (Twin Cities)
14	Johns Hopkins University	36	U. of North Carolina (Chapel Hill)
15	Lehigh University	37	U. of Pennsylvania
16	Michigan State University	38	U. of Southern California
17	Northeastern University	39	U. of Texas
18	Ohio State University	40	U. of Virginia
19	Penn State University	41	U. of Washington
20	Purdue University	42	U. of Wisconsin
21	Rice University	43	US Naval Academy
22	Southern Methodist University	44	Yale University

This table presents an alphabetical list of colleges whose graduates in the Emsi database make up the core of our dataset. As described in the text, we supplement this dataset with a list of individuals who match by name to the founders.

Appendix Table 3: Selection bias checks

Panel A: Firm Characteristics

	Total count	Founders not in analysis sample	Founders in analysis sample	Difference	Mean (not in sample)	Mean (in sample)	P-value
			Industry				
Business/Financial Services	54,530	40,479	14,051	-0.004	0.215	0.219	0.293
Consumer Goods	54,530	40,479	14,051	0.015	0.037	0.022	0.000
Consumer Services	54,530	40,479	14,051	-0.005	0.176	0.181	0.146
Energy and Utilities	54,530	40,479	14,051	0.001	0.013	0.012	0.262
Healthcare	54,530	40,479	14,051	0.040	0.167	0.128	0.000
Industrial Goods/Materials	54,530	40,479	14,051	0.006	0.022	0.017	0.000
Information Technology	54,530	40,479	14,051	-0.052	0.370	0.421	0.875
			Time period of firm start				
Firm start year	54,564	40,510	14,054	2.013	2009.298	2007.284	0.000
Start just before Great Recession (06-08)	54,564	40,510	14,054	-0.043	0.157	0.200	0.000
Start in dot-com era (1999-2001)	54,564	40,510	14,054	-0.048	0.075	0.123	0.000
Firm start: pre-1990	54,564	40,510	14,054	0.003	0.004	0.001	0.000
Firm start: 1990-1994	54,564	40,510	14,054	0.005	0.013	0.009	0.000
Firm start: 1995-1999	54,564	40,510	14,054	-0.005	0.080	0.085	0.080
Firm start: 2000-2004	54,564	40,510	14,054	-0.037	0.129	0.166	0.875
Firm start: 2005-2009	54,564	40,510	14,054	-0.060	0.093	0.153	0.000
Firm start: 2010-2014	54,564	40,510	14,054	-0.087	0.166	0.253	0.000
Firm start: 2015-2019	54,564	40,510	14,054	0.214	0.358	0.144	0.000
			Firm location				
Firm in CA	54,564	40,510	14,054	-0.024	0.418	0.443	0.000
Firm in CA or MA	54,564	40,510	14,054	-0.034	0.503	0.537	0.000
			Firm outcome				
IPO	54,564	40,510	14,054	0.001	0.048	0.046	0.475
Successful Acquisition	54,564	40,510	14,054	-0.066	0.131	0.197	0.000
Unsuccessful Acquisition	54,564	40,510	14,054	-0.098	0.116	0.213	0.000
Firm bankrupt	54,564	40,510	14,054	-0.000	0.001	0.001	0.875
Firm out of business	54,564	40,510	14,054	-0.019	0.094	0.113	0.000
Firm assets acquired	54,564	40,510	14,054	-0.007	0.012	0.019	0.000
Firm private (unexited and not failed)	54,564	40,510	14,054	0.188	0.599	0.412	0.000

Panel B: VC and Founder Characteristics

	Total count	Founders not in analysis sample	Founders in analysis sample	Difference	Mean (not in sample)	Mean (in sample)	P-value
Log of oldest VC firm age	54,393	40,374	14,019	-0.017	3.056	3.073	0.028
Total rounds	54,564	40,510	14,054	-0.442	3.238	3.680	0.000
Time as a private firm	54,542	40,489	14,053	0.453	8.117	7.664	0.000
Total investment (inflation adjusted) in millions	54,026	40,118	13,908	-2.404	36.414	38.818	0.200
Log total investment (inflation adjusted)	54,026	40,118	13,908	-0.572	14.558	15.130	0.000
				Demographics			
Female	54,847	40,785	14,062	0.015	0.103	0.088	0.000
White	53,419	39,425	13,994	0.011	0.660	0.649	0.019
East Asian	53,419	39,425	13,994	0.022	0.090	0.068	0.000
Indian	53,419	39,425	13,994	-0.006	0.099	0.105	0.047
Jewish	53,419	39,425	13,994	0.005	0.167	0.162	0.165
Hispanic	53,419	39,425	13,994	0.024	0.068	0.044	0.000
African	53,419	39,425	13,994	0.000	0.004	0.004	0.875
Middle Eastern	39,473	27,372	12,101	-0.001	0.001	0.002	0.049
				Education			
College info in VS	54,850	40,788	14,062	-0.147	0.696	0.843	0.000
Top school in VS (Ivies+)	54,850	40,788	14,062	-0.045	0.101	0.146	0.000

This table compares the matched and unmatched founder subsamples in VentureSource (VS) across start-up (Panel A) and VC/founder (Panel B) characteristics to evaluate the extent of selection bias in our VS-Emsi merge. All variables come from VS or hand-collected data. VS provides portfolio firm industry, start and end dates, headquarters location, firm outcome, and characteristics of VC investors. Demographic data on gender and ethnicity are hand-collected. Matched founders are founders who we link to a resume in the Emsi data. Unmatched and matched founders are all listed as founders of US-based VC-backed firms. The p-value is from a two-sample t-test of differences in means between the matched and unmatched groups.

Appendix Table 4: Seniority Achievement Matrix

	Seniority																			
Career length	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	100	79	61	47	39	33	28	26	24	22	19	17	13	11	10	9	8	7	6	4
2	100	78	60	44	36	30	26	23	22	19	17	14	11	9	8	7	6	6	4	3
3	100	82	65	49	40	33	28	25	23	20	17	14	11	9	8	7	6	5	4	3
4	100	86	70	55	45	37	31	28	25	22	19	16	12	10	8	7	6	6	4	3
5	100	88	74	59	49	40	34	30	28	24	20	17	13	10	9	8	7	6	5	3
6	100	90	78	64	54	44	37	33	30	26	22	18	14	11	9	8	7	6	5	4
7	100	92	81	68	59	49	41	37	34	29	25	20	15	12	10	9	8	7	5	4
8	100	93	83	72	63	53	45	40	36	32	27	22	17	13	11	10	9	8	6	4
9	100	94	86	75	67	57	49	44	40	35	30	24	19	15	13	11	10	9	7	5
10	100	95	87	78	70	61	53	48	44	38	33	27	21	16	14	12	11	10	7	5
11	100	96	89	80	74	65	57	52	47	41	35	29	22	18	15	14	12	11	8	6
12	100	96	90	82	76	68	61	56	51	45	39	32	25	20	17	16	14	12	9	6
13	100	97	91	84	78	70	64	58	54	48	41	34	27	22	19	17	15	13	10	7
14	100	97	92	85	80	73	67	62	57	51	45	37	30	24	21	19	17	15	11	8
15	100	97	93	86	81	75	69	65	60	54	48	41	33	27	24	22	19	17	13	9
16	100	97	93	87	83	77	72	67	63	57	51	44	36	30	26	24	21	18	14	10
17	100	98	93	88	83	78	73	69	65	60	54	46	38	32	28	25	23	20	15	10
18	100	98	94	88	84	80	75	71	67	62	56	49	41	34	31	27	24	21	16	11
19	100	98	94	89	85	81	76	72	69	64	58	52	43	36	33	30	27	23	18	12
20	100	98	94	89	85	81	77	73	70	65	59	53	45	38	35	31	28	25	19	13
21	100	98	94	89	86	82	77	74	71	66	61	54	46	40	36	33	29	25	19	13
22	100	98	95	90	87	83	79	76	72	68	63	57	48	42	38	35	31	27	21	14
23	100	98	95	90	87	83	79	76	73	69	64	58	50	43	39	36	32	28	22	15
24	100	98	95	90	87	84	80	77	75	71	66	60	52	45	42	38	34	30	23	16
25	100	98	95	90	87	84	80	77	74	70	66	60	52	46	42	38	35	30	23	17
26	100	98	94	89	87	83	80	77	75	71	66	61	53	47	43	39	36	32	25	18
27	100	98	95	89	87	84	80	78	75	71	67	62	54	47	44	40	37	33	26	19
28	100	98	95	90	87	84	81	78	76	72	68	62	55	48	44	41	37	33	26	19
29	100	98	95	89	87	84	80	78	75	72	68	62	55	49	45	42	38	34	27	19
30	100	98	94	89	87	84	80	78	75	72	68	63	56	49	46	42	39	35	28	20

The table shows the percentage of individuals who reach at least a given seniority (horizontal axis) tabulated by career length in years (vertical axis) as listed in the Emsi resume data. Seniority, defined precisely in the data section, captures the number of years it takes, on average, to obtain a given job title in a given industry.

Appendix Table 5: Post-founding Seniority and Wage — Labor Force Entry Cohort

Panel A: Post-founding Seniority

	(1)	(2)	(3)
Successful Founder	6.045***	3.638***	3.716***
	(0.188)	(0.206)	(0.419)
Failed Founder	5.401***	3.010***	3.106***
	(0.119)	(0.130)	(0.388)
Departed Founder	5.745***	3.456***	3.523***
	(0.188)	(0.201)	(0.410)
Pre-founding Seniority		0.554***	0.544***
		(0.00488)	(0.00491)
Years after Graduation		0.0282***	0.0252***
		(0.00406)	(0.00416)
Male			0.299***
			(0.00939)
Founder × Male			-0.336
			(0.352)
STEM			-0.106***
			(0.00967)
Founder × STEM			0.246
			(0.229)
Elite Undergrad			0.0751
			(0.0526)
Founder			-0.197
× Elite Undergrad			(0.237)
MBA			1.229***
			(0.0186)
Founder × MBA			-0.208
			(0.332)
Elite MBA			0.917***
			(0.0367)
Founder × Elite MBA			-0.978**
			(0.432)
Has a PhD			0.582***
			(0.0394)
Founder × PhD			-0.143
			(0.283)
Cohort FE	Y	Y	Y
Observations	3,659,758	3,105,154	2,556,787
Adjusted R-squared	0.258	0.399	0.407

Panel B: Post-founding Wage

	(1)	(2)	(3)
Successful Founder	0.326***	0.172***	0.163***
	(0.0128)	(0.0140)	(0.0296)
Failed Founder	0.291***	0.159***	0.151***
	(0.00775)	(0.00856)	(0.0275)
Departed Founder	0.243***	0.113***	0.0999***
	(0.0138)	(0.0149)	(0.0286)
Log(Pre-founding Wage)		0.518***	0.497***
		(0.00415)	(0.00438)
Years after Graduation		0.000380	0.000229
		(0.000268)	(0.000278)
Male			0.0508***
			(0.000787)
Founder × Male			0.00126
			(0.0246)
STEM			0.0280***
			(0.000907)
Founder × STEM			0.0156
			(0.0156)
Elite Undergrad			-0.00620*
			(0.00350)
Founder			-0.0309*
× Elite Undergrad			(0.0166)
MBA			0.0673***
			(0.000942)
Founder × MBA			-0.0861***
			(0.0215)
Elite MBA			0.0432***
			(0.00174)
Founder × Elite MBA			-0.0250
			(0.0285)
Has a PhD			0.0104***
			(0.00399)
Founder × PhD			0.0215
			(0.0204)
Cohort FE	Y	Y	Y
Observations	4,265,706	3,762,175	3,206,744
Adjusted R-squared	0.166	0.367	0.372

This table presents OLS regression results where post-founding seniority (Panel A) and log wage (Panel B) are regressed onto founder status and characteristics. Departed founder refers to founders who left active and private firms. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. The sample includes founders and his or her labor force non-founder cohort. Standard errors are in parentheses and are clustered at the cohort level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

## Appendix Table 6: Seniority and Wage Differences — Labor Force Entry Cohort

Panel A: Seniority Difference	(1)	(2)	(3)	*Panel B: Wage Difference*	(1)	(2)	(3)
Successful Founder	1.643***	1.629***	1.715***	Successful Founder	0.0248	0.0223	-0.0410
	(0.247)	(0.247)	(0.501)		(0.0167)	(0.0168)	(0.0350)
Failed Founder	1.088***	1.075***	1.175**	Failed Founder	0.0319***	0.0294***	-0.0317
	(0.153)	(0.153)	(0.462)		(0.0104)	(0.0104)	(0.0324)
Departed Founder	1.579***	1.565***	1.644***	Departed Founder	-0.0153	-0.0179	-0.0820**
	(0.239)	(0.239)	(0.487)		(0.0175)	(0.0175)	(0.0336)
Years after Graduation		-0.0414***	-0.0489***	Years after Graduation		-0.00766***	-0.00821***
		(0.00462)	(0.00483)			(0.000354)	(0.000366)
Male			0.140***	Male			0.000252
			(0.00883)				(0.000829)
Founder × Male			-0.614	Founder × Male			0.0310
			(0.419)				(0.0294)
STEM			-0.0269***	STEM			-0.0119***
			(0.00957)				(0.00107)
Founder × STEM			0.398	Founder × STEM			0.0463**
			(0.272)				(0.0188)
Elite Undergrad			-0.104*	Elite Undergrad			-0.0179***
			(0.0574)				(0.00399)
Founder			0.282	Founder			0.00911
× Elite Undergrad			(0.284)	× Elite Undergrad			(0.0205)
MBA			0.785***	MBA			0.0275***
			(0.0196)				(0.000944)
Founder × MBA			-0.181	Founder × MBA			-0.0707***
			(0.398)				(0.0255)
Elite MBA			0.570***	Elite MBA			0.00129
			(0.0362)				(0.00184)
Founder × Elite MBA			-0.509	Founder × Elite MBA			0.0343
			(0.522)				(0.0340)
Has a PhD			0.595***	Has a PhD			0.0534***
			(0.0398)				(0.00445)
Founder × PhD			-0.0483	Founder × PhD			0.0325
			(0.343)				(0.0250)
Cohort FE	Y	Y	Y	Cohort FE	Y	Y	Y
Observations	3,105,272	3,105,154	2,556,787	Observations	3,762,293	3,762,175	3,206,744
Adjusted R-squared	0.123	0.123	0.127	Adjusted R-squared	0.044	0.045	0.046

This table presents OLS regression results for seniority and wage differences between pre- and post-founding jobs. Seniority difference (Panel A) and log wage difference (Panel B) are regressed onto founder status and characteristics. Departed founder refers to founders who left active and private firms. Active firms are defined as firms without an exit and less than 10 years old and received funding within the last 3 years. The sample includes founders and his or her labor force non-founder cohort. Standard errors are in parentheses and are clustered at the cohort level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Figure 1: Mean Seniority, Grouped by Maximum Seniority Achieved
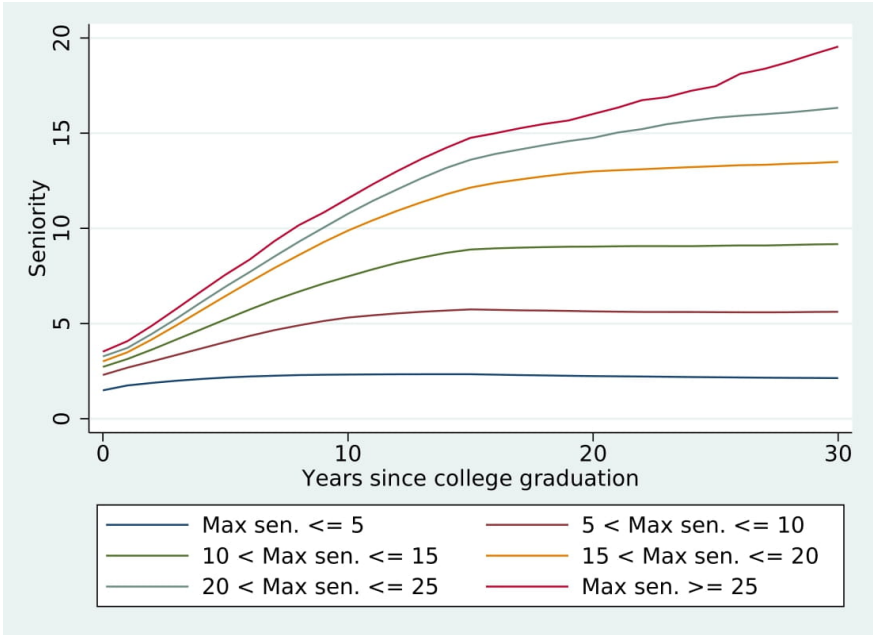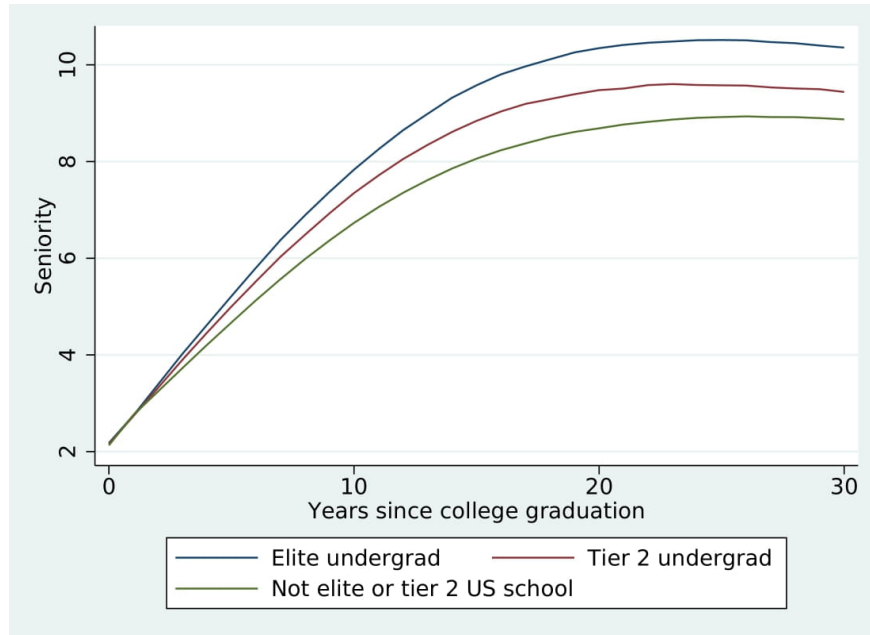

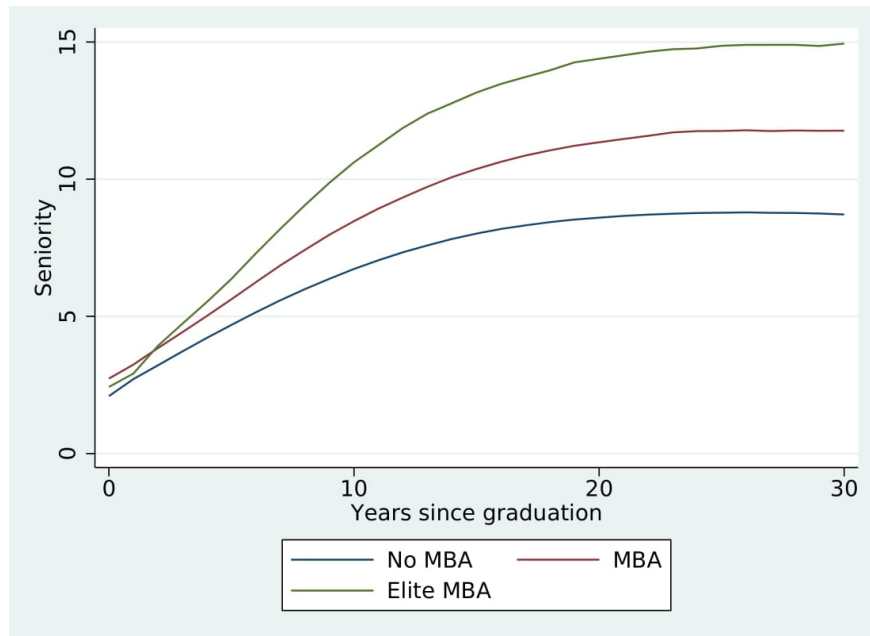**Figure 2: Seniority at Selected Percentiles over Time**
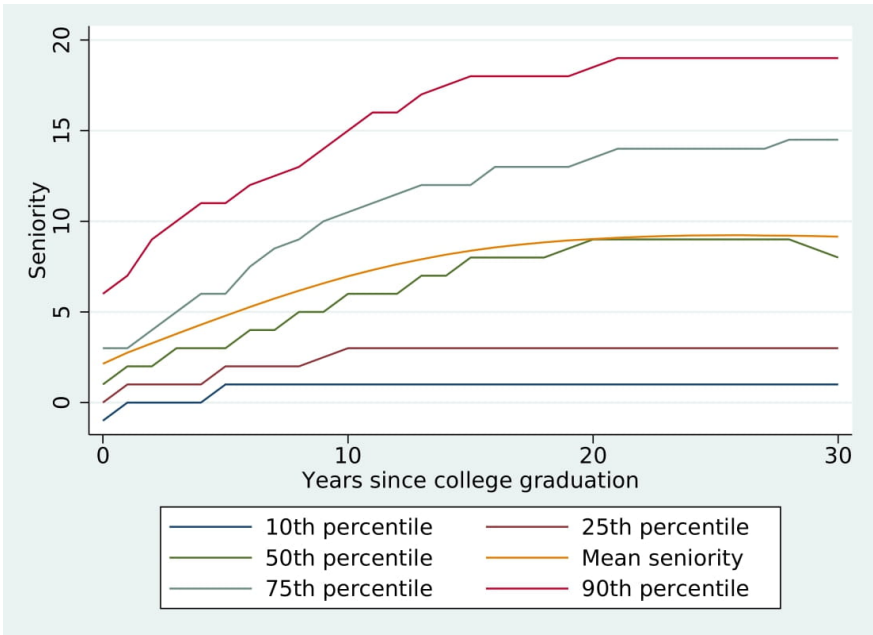
Seniority percentiles for the entire Emsi dataset (5,000,000+ resumes).

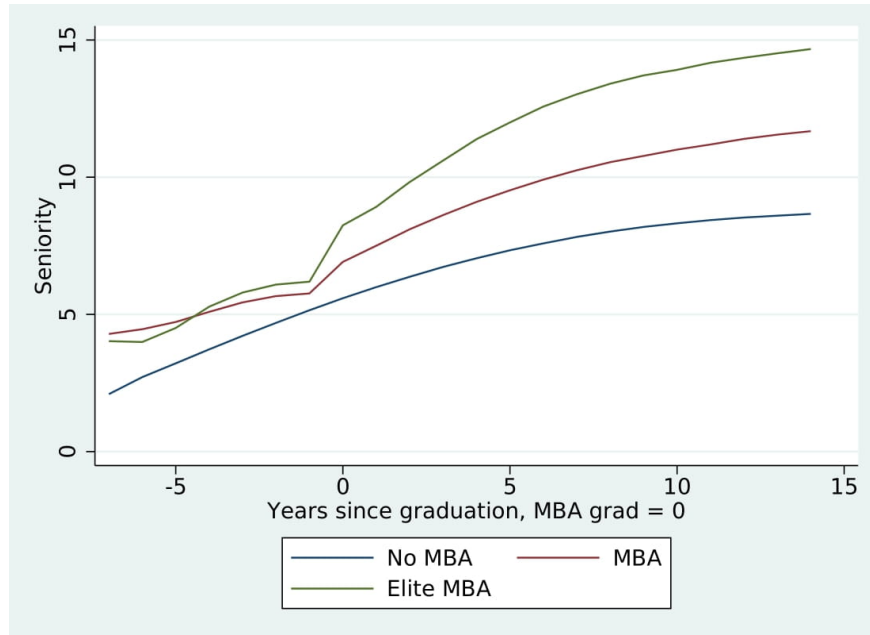**Figure 3: Seniority Achievement by Undergraduate Education**

See Appendix Tables 1 and 2 for the classification of schools into Elite and Tier 2.

**Figure 4: Seniority Achievement by MBA Status**

Elite MBAs schools are Harvard, Kellogg, Stanford, Booth, and Wharton.

Figure 5: Seniority Achievement by MBA Status, Centered at MBA Graduation

For MBA recipients, 0 is the year of MBA graduation. For individuals without MBAs, dates are standardized so that 0 is 7 years after college graduation, the median time for MBA graduation.

Figure 6: Founder and Non-Founder Seniority
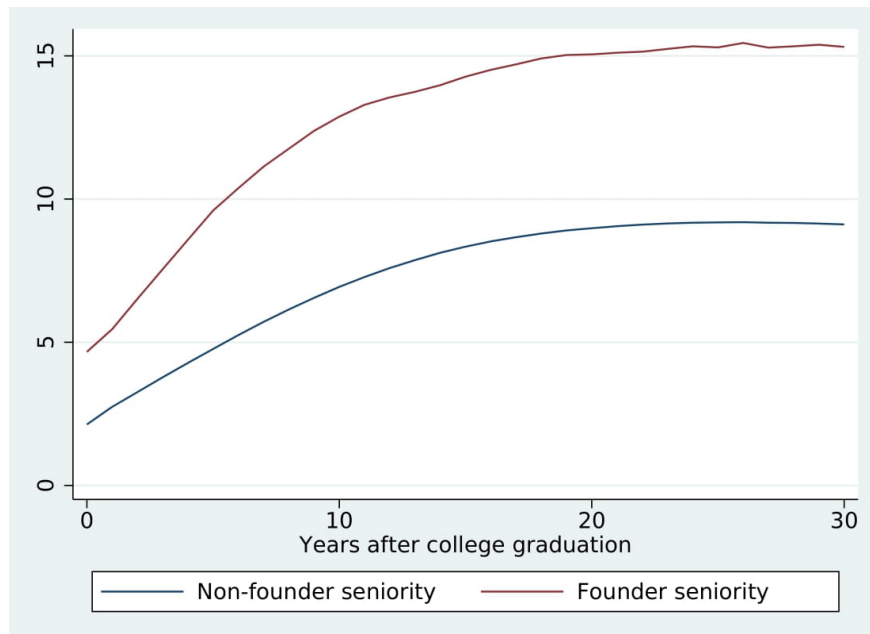
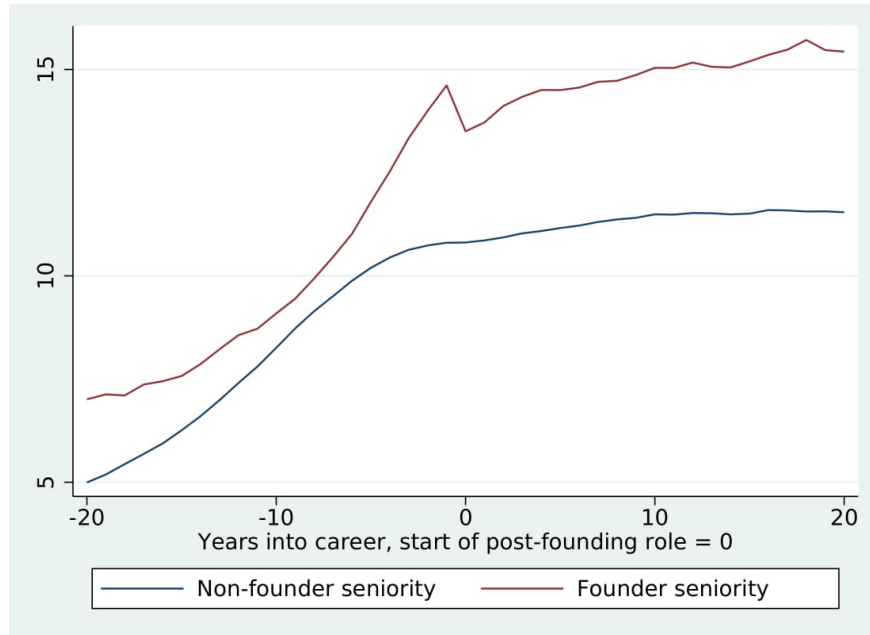**Figure 7: Founder and Matched Non-Founder Seniority**

Figure 7 includes only founders and non-founders matched to a pre-founding cohort. For founders, 0 is the start year of the post-founding job. For non-founders, 0 is the start year of the post-founding job for the founder to whom they are matched.