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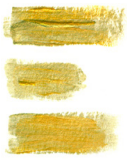

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Career Risk and Market Discipline in Asset Management

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Abstract

Using hand-collected data on 1,627 hedge fund employees, we investigate the role of talent and luck in their careers. Upon entry in the hedge fund industry, careers accelerate, especially for employees with high-quality education and asset management experience. However, those who achieve high-ranking positions tend to face significant and permanent career setbacks if their fund is liquidated after persistently under-performing its benchmark. Hence, the "scarring effects" of fund liquidation appear to reflect a loss of reputation rather than the materialization of career risk. Our results reveal a new facet of market discipline in asset management, operating via the labor market.

JEL classification: G20, G23, J24, J62, J63.

Keywords : careers, hedge funds, asset managers, market discipline, scarring effects.

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1 Introduction

The salaries of finance employees are typically much higher than those of non-finance workers with similar qualifications and ability, and tend to be more unstable: in 2006 the finance wage premium was 50% and the wage profiles of finance workers were 8% more dispersed than those of non-finance ones (Philippon and Reshef, 2012). Both of these features are even more extreme in asset management, and particularly in the hedge fund industry. Indeed, the media often express skepticism that such high levels of pay are in line with the performance of the corresponding funds and reflect the true talent of their managers. For instance, in 2012 The Economist wrote: "It is ... easy to think of people who have become billionaires by managing hedge funds; it is far harder to think of any of their clients who have got as rich". [1]

In principle, the benefit of such a high compensation may be offset, at least partly, by its volatility and by the danger of career setbacks, possibly permanent ones. The presence of incentive problems in asset management obviously calls for leaving a considerable amount of risk on the shoulders of employees, especially those with greatest decision-making power (see Murphy (1999) and Edmans et al. (2017)). Indeed, in this industry a large fraction of employees' compensation is performance-sensitive, with a fixed base salary topped by performance-related bonuses. However, typically asset managers' compensation is indexed to performance so as to expose them much more to upside than to downside risk.[2] Therefore, it becomes important to ask whether, over and above the incentives provided by their compensation scheme, asset managers are exposed to the discipline stemming from the labor market, in the form of permanent career setbacks following under-performance. In other words, the question is whether the labor market acts as an additional discipline device for asset managers, over and above the incentives that employment contracts create within the firm's boundaries. This is the main research question addressed by this paper, and is one on which no previous evidence is available.

[1] "Rich managers, poor clients", 22 December 2012.

[2] This applies particularly to hedge fund managers, whose performance-based incentive fee effectively is a call option written by the investor on the hedge fund's asset value, with a strike price determined by the "high water-mark" and "hurdle rate" provisions, together with the value at which investors underwrite the fund. The high water-mark provision states that the manager receives the incentive fee only if the fund's net asset value exceeds its previous peak, while the hurdle rate is the minimum return above which the manager receives the incentive fee.

To address this question, we focus on professionals working in hedge funds, as incentive concerns and their career implications can be expected to be particularly salient in this segment of asset management, for three complementary reasons. First, it is the quintessential business of risk-taking, where a single bad decision may blow up a whole fund. Second, hedge fund managers have the greatest discretion in their investment choices, owing to the lightly regulated nature of the business: this creates strong moral hazard issues, given the difficulty of monitoring and reining in top talent (Axelson and Bond, 2015). Third, hedge funds carry out very complex trades and arbitrage strategies, which require scarce and highly specialized talent. Hence, they compete keenly for such talent. Such labor market competition prevents insuring employees against performance shocks: as soon as their true quality is discovered, talented professionals extract all rents and untalented ones can get no subsidy (Harris and Holmstrom, 1982; Acharya et al., 2016)).

We hand-collect unique data about the careers of 1,627 individuals who at some point in their careers worked in a hedge fund (according to the Lipper-TASS database), holding a low, middle or top managerial position in the investment company managing the fund. Hence, not all the hedge fund employees in our sample eventually become CEOs (only 62% do): under this respect, our data differs from those used in most studies on managers' careers, which consider only CEOs. For each individual, we observe gender, education, and year of entry in the labor market, as well as all the job changes within and across firms, which include not only hedge funds but also banks, insurance companies, mutual funds and non-financial companies. We classify their jobs based on their position within the corporate hierarchy and on their typical salary. As the data cover employment histories spanning from 1963 to 2016, they shed light on how careers evolve in different market conditions and development stages of the hedge fund industry. We observe that in general career paths are steep, with most promotions occurring early on, consistently with the presence of up-or-out contracts designed to control high moral hazard with dynamic incentives (Axelson and Bond, 2015).

Upon being hired by a hedge fund company, professionals experience a significant acceleration of their career. The acceleration is greatest for individuals with high talent, as measured by graduate degrees in top schools and previous job experience in asset management, and for male employees, consistently with other evidence on gender bias in the finance industry. Career progress is also faster for those who take

up jobs in funds that outperformed their benchmark in the previous three years, suggesting that the respective parent companies have stronger financial muscle in their hiring policies, possibly due to greater fund inflows from investors.[3]

While entry in the hedge fund industry tends to propel professionals quickly to high-level positions, it also exposes them to the danger of permanent setbacks in case of liquidation of the funds they work for. Hedge funds are particularly suited to investigate how careers are affected by liquidations, as these are not rare events, especially upon unsatisfactory performance. We find that such setbacks, in terms of both job level and salary, are non-negligible and tend to be significantly larger for high-ranking employees than for others, and are frequently accompanied by switches to other employers. Moreover, the post-liquidation decline in job levels and salary is much larger for the individuals who switch to a new employer in the first year after the liquidation.

In principle, such "scarring effects" of liquidations may result either from a loss of reputation for ability and hard work ("skill") or from the accidental destruction of the managers' fund-specific human capital, driven by market turbulence (e.g., poor performance of the relevant asset class) or restructuring of the parent investment company ("luck"). We label these two interpretations respectively as the "market discipline" and the "career risk" hypothesis. In order to discriminate between them, we test whether "scarring effects" are concentrated in funds that persistently underperform relative to their benchmark before liquidation. We find that indeed this is the case: fund liquidation is not *per se* associated with a career slowdown once one controls for its interaction with persistently negative pre-liquidation relative performance.

This evidence is consistent with the idea that the labor market provides an additional discipline mechanism, on top of those arising from compensation mechanisms: managers in charge of funds liquidated upon under-performing are penalized in their subsequent career compared to those that are liquidated after good performance. In this sense, our findings nicely complement those of Gibbons and Murphy (1990), who provide empirical support for relative performance evaluation in CEO pay and retention policies. We show that the incentive effects of relative performance ex-

[3]This is consistent with the evidence by Brown and Matsa (2016) that high-quality job seekers shy away from distressed financial firms, based on applicants' responses to job postings during the recent crisis.

tend beyond the boundaries of firms' compensation and retention policies, as they encompass also the hiring policies of subsequent employers.

Our evidence about the "scarring effects" of fund liquidations is related to previous work on the effect of firm bankruptcies. Eckbo et al. (2016) report that only one third of CEOs maintain executive employment after a bankruptcy filing, especially when their firm's previous profitability was below the industry average, and departing CEOs suffer large income and equity losses. Similarly, Gao et al. (2017) document that, following negative credit events (such as defaults, bankruptcies and rating downgrades) affecting their loan portfolios, managers working in banks underwriting syndicated loans are more likely to switch to a lower-ranked bank, and face demotion in their subsequent career.

Others have studied how bankruptcies affect the careers of rank-and-file employees: Graham et al. (2017) analyze employer-employee matched panel data from the US Census for thirty states from 1985 to 2008, and document a persistent 15-percent drop in wages following bankruptcy; Hochfellner et al. (2015) show that workers in German firms affected by the financial crisis experienced persistent earnings losses of approximately €2,400 per year, nine weeks longer unemployment spells, and a lower probability of climbing the job ladder than workers in unaffected firms; and Baghai et al. (2017b) find that inventors become less productive after bankruptcy dissolves their teams.

Despite the apparent similarity, however, hedge fund liquidations are quite different from bankruptcies. As typically investment companies manage several hedge funds, liquidating a fund rarely coincides with the whole firm's closure, and therefore with the forced reallocation of its employees to other employers. By the same token, the liquidation of a fund is a corporate decision that may convey information regarding the employees formerly working in the fund: if it follows disappointing fund performance, it may reflect a negative judgment about their skills and potential; alternatively, it may result simply from a strategic decision to redeploy resources–including personnel–elsewhere, for instance to other existing or newly created funds. This heterogeneity in the possible motives of liquidations is what makes it particularly important to condition their career effects on previous fund performance, so as to infer whether these effects reflect a revision in beliefs about employees' skills, or rather the accidental loss of fund-specific human capital.

Our paper adds also to a strand of research on managerial careers that focuses

on the impact of macroeconomic or financial market conditions at the time of labor market entry on workers' subsequent labor market outcomes: Oyer (2008) documents that a buoyant stock market encourages MBA students to go directly into investment banking upon graduation, with a large and lasting effect on their subsequent career, while Schoar and Zuo (2017) analyze the careers of CEOs and find that they are persistently affected by the macroeconomic conditions that prevail when they enter the labor market. Similarly, Oreopoulos et al. (2012) find that people who graduate during recessions suffer persistent earnings declines lasting ten years. Our evidence differs from this work because it focuses on the role of the labor market in rewarding "skill" as measured by relative performance rather than "luck" as determined by general market or macroeconomic conditions.

The paper is organized as follows. Section 2 explains the construction of the data set, illustrates the structure of the data, and describes the characteristics of the workers in our sample and those of their careers. Section 3 investigates how careers of individuals evolve upon entry in the hedge fund industry, also depending on employees' and fund characteristics. Section 4 describes how careers differ between employees working in liquidated hedge funds and a control group of employees, depending on their job position before the liquidation and on the funds' previous relative performance. Section 5 concludes.

2 Data

We collect data about the characteristics and career paths of professionals who in 2007-14 worked for at least some time in the hedge fund industry, as employees – e.g. trader, analyst, portfolio manager, top executive – of an investment company present in the Lipper Hedge Fund Database (TASS). [4] Most of the professionals in the sample also held positions in other companies during their careers, namely other asset management companies (mutual funds, pension funds, private equity funds, etc.), banks, insurance companies, consultancies or even companies outside the financial sector. Moreover, some of these professionals work at the same time for several employers,

[4]TASS contains quantitative and qualitative information about 21,000 hedge funds, such as monthly performance, addresses, inception date, investment focus, management, parent company, as well as names and surnames of employees, the investment company employing them, the hedge fund for which they worked and their job.

for instance a bank and an investment company, or multiple investment companies. And, when employed by an investment company that has several funds under management, the same professional may operate in multiple funds: for instance, she may serve two different hedge funds, while holding the position of chief investment officer (CIO) in their parent company.

To construct the data set, we draw the names of 13,056 hedge fund professionals from the TASS database. The TASS database contains biographical information about hedge fund managers (name and surname, name and address of the fund where they work, start and end dates of their job, type of job, i.e. portfolio or marketing manager), about the investment companies that employ them, and about the funds managed by the company, since typically each investment company owns several hedge funds. Crucially, the TASS database also allows us to link a professional employed by a given investment company to the hedge funds managed by that company for which she has operates. This information allows us to identify the professionals that are potentially affected by fund-level events such as liquidations.

To complement the information provided by TASS with the previous and subsequent work histories of these professionals, we hand-collected data about their education (degrees and respective dates, subject and school for each degree), year of the first job, as well as the start dates, end dates, employers and job levels held throughout the worker's career. These data are drawn from individual resumes available on a major professional networking website, together with information available on Bloomberg, Businessweek and companies' websites. For many managers, employment histories were missing or too incomplete, so that the final sample consists of 1,627 managers. As a result, our sample is likely to over-represent more talented professionals, insofar as these tend to have public profiles and populate them with complete and up-to-date information. In presenting our results, we shall discuss the external validity issues that may arise from this sample selection.

We classify the jobs held by the professionals in our sample along two dimensions: the position of each job within the corporate hierarchy of the company that employs them, and the typical salary associated with each job title and sector. We first match the job titles reported by professionals in their curricula with the Standard Occupational Classification (SOC) produced by the Bureau of Labor Statistics (BLS). Then, in order to create a measure of the position of an employee in the job ladder of the company that employs her, we group the SOC codes into the 6 following bins,

meant to capture different degrees of decision-making power:[5]

1. Craft Workers, Operatives, Labors and Helpers, and Service Workers (coded as 1);
2. Technicians, Sales Workers, and Administrative Support Workers (coded as 2);
3. Professionals (coded as 3);
4. First/Mid Officers and Managers (coded as 4);
5. Top Executives (coded as 5, except for those coded as 6);
6. CEOs, or other positions at the head of the corporate hierarchy (coded as 6).

Since employees holding the same position in the job ladder may have different compensations in different sectors (e.g., the Chief Operating Officer of an asset management company typically earns more than that of a commercial bank), we use the Occupational Employment Statistics (OES) to identify the average annual salary associated in 2016 to each SOC code in 6 sectors: (i) asset management (AM), (ii) commercial banking and other lending institutions (CB); (iii) financial conglomerates, defined as institutions encompassing lending, insurance and/or asset management (CO); (iv) insurance (IN); (v) other finance, which includes mainly financial consultancies and portfolio advisors (OF); and non-financial firms and institutions, including government, supranational institutions and stock exchanges (NF). The end result is an imputed salary for each professional-year observation in our sample. For individuals employed by more than a single company at the same time, we keep track of all their positions, but define their job level as the highest one that they hold at any moment in time, and their salary as that associated with the corresponding SOC code.

Table 1 reports the average salary and provides examples of job titles associated to each job level: for obvious reasons of space, the table cannot report the thousands of job titles present in our data. It is important to understand that salaries vary not only across the 6 above-listed job levels, but also within each job level depending on the SOC code of the relevant job title, and within each SOC code depending

[5]These job bins are based on the EEO-1 Job Classification system, except for top managers that we group in a separate bin.

on the relevant sector. Since OES wage data are available at the relevant level of disaggregation only since 2005, we prefer to neglect altogether time-series variation in salary levels for the same SOC code and sector, to avoid the inconsistencies stemming from a mix of actual and imputed data. Moreover, our salary data do not include variable compensation, which typically form a significant portion of total pay in asset management and investment banking: as a result, they understate the differences in compensation between sectors and occupations.

[Insert Table 1]

2.1 Characteristics of Professionals and Careers

Table 2 describes the characteristics of the individuals in our sample. All of the professionals that report data on educational attainment have a university degree: at the undergraduate level for 40 percent of the sample, at master's level for another 42 percent, and at Ph.D. or J.D. level for 3 percent. As one would expect, education in economics or finance is dominant: 60 percent of the individuals in the sample have received their highest degree in these subjects. A sizeable minority (17 percent) obtained their highest degree from a top-15 university, defined on the basis of QS Ranking, and a smaller group (7 percent) received it from a mid-level university (ranking between 16 and 40). The age composition of the sample overweights the cohort that started working in the 1990s, which forms almost half of the sample, while the cohorts that started working in the 1980s and 2000s are 21 and 29 percent of the total, and only 4 percent entered the labor market before 1980. Consistently with anecdotal evidence about gender imbalance in finance, the sample is dominated by males (84 percent).

[Insert Table 2]

By construction, careers are dominated by positions in asset management, with 71 percent of person-year observations referring to occupations in this sector. However, some of the professionals in the sample spend part of their careers in commercial banking (7 percent of person-year observations) or outside finance (17 percent). The typical job level in the sample is that of a middle managerial position (which belongs to bin 4 of our classification), with a 2016 average salary of $189,082 and a median one

of $217,950, revealing a skewed distribution of salaries. The individuals in the sample do not switch only between job levels but also across companies over their career paths: 13 percent of person-year observations feature switches across employers.

A considerable number of individuals in the sample attain top positions during their careers: Table 2 shows that 40 percent of person-year observations refer to level-6 positions. Accordingly, the right panel of Figure 1 shows that the same 40 percent earns the top salary. The figure also reveals that low and middle managerial positions are the next most common jobs in the sample. The prevalence of managerial positions arises from the fact that the sample is formed by professionals who at some point in their career held positions in the hedge fund industry, which typically attract highly talented individuals: in this sense, our data set is likely to over-represent talented workers, as in studies based on sample of graduates from prestigious universities, such as Oyer (2008). However, our sample is not formed only by people who eventually become CEOs, as in Benmelech and Frydman (2015), Graham et al. (2013), Kaplan et al. (2012), and Malmendier et al. (2011): differently from these studies, the individuals in our sample may just rise to low- or mid-level managerial tasks, or even drop from a top position to a lower one.

[Insert Figure 1]

Figure 2 illustrates career paths by plotting the average job level and average salary against work experience: the typical individual in the sample starts off at a low- or mid-level managerial position (job levels 3 and 4), rises to high-level managerial positions (job level 5) after about 20 years, and then works his or her way gradually to top-level positions over the remaining 20 years. The progression of the average salary appears to be faster than that of job levels in the early phase of the career, and slower in the later part of the career. However, this is likely to reflect simply the fact that as people rise through the ranks, an increasing fraction of their total pay is made of variable compensation, which is not captured by our salary measure.

[Insert Figure 2]

To control for possible cohort effects, Figures 3 and 4 illustrate the typical career path and salary profile separately for three cohorts, formed by people who entered the labor market in the 1980s, 1990s and 2000s respectively. The three cohorts

feature the same typical career path until 2009, even though the hedge fund industry underwent wide changes over the work lives of individuals in these three cohorts: it was a nascent industry in the late 1980s and early 1990s, boomed in the mid-1990s and plateaued in the 2000s. Instead, the career paths of the three cohorts diverge after 2009: that of the youngest cohort first levels off and then declines, while those of the older cohorts do not. This is likely to reflect the fact that by 2009 older asset managers had already reached top positions that sheltered them from the effects of the financial crisis, while young professionals who started off in the 2000s were hit by the crisis while still in the early phase of their careers.

[Insert Figures 3 and 4]

2.2 Hedge Fund Returns

We draw hedge fund return data from the TASS database. Hedge funds are classified according to their strategies, as described by TASS and grouped in 6 classes by Agarwal, Daniel and Naik (2009, Appendix B): relative value, security selection, multiprocess, directional trading, funds of funds, and a residual category.

Panel A of Table 3 shows the mean and standard deviation of the yearly percentage return of the respective benchmarks, defined as the average yearly return of the funds in the respective class for the whole sample period. As expected, given the high-risk strategies pursued by these funds, average yearly benchmark returns are quite high, ranging between 10.1% for relative value to 23.8% for directional traders funds, and their volatility is correspondingly high.

[Insert Table 3]

Panel B of Table 3 shows the range of variation of the funds' relative performance (defined as the difference between their percentage returns and those of their respective benchmarks) for each of the six classes. The range of variation of fund relative performance is very large, between 15 and 110 times the corresponding average benchmark return. This great heterogeneity in performances will prove to be important for the analysis of the effect of liquidations on individual careers in Section 4 below, where we explore how such effect varies depending on fund relative performance.

3 Career Paths in the Hedge Fund Industry

Our data on the career profiles of finance professionals enables us to investigate first of all whether the evidence is consistent with the popular belief that being hired by a hedge fund is associated with career and salary advancement larger than those recorded for other employer switches, and whether such advances are correlated with measures of employees' talent and funds' characteristics. In the next section, we investigate whether working in this industry also exposes employees to the danger of setbacks in their career.

First, we provide some descriptive evidence on the development of professionals' careers upon being hired by a hedge fund company: Figure 5 displays the average job level and the salary of 1,204 individuals joining such a company for the first time in their career, from 15 years before to 30 years after the hire (if such data are available). The figure indicates that entry in the hedge fund industry coincides with a remarkable leap in the career of the individuals in our sample: on average, the job level jumps by almost 1 notch (from level 4 to 5) and then continues to grow gradually by a further half-notch over the subsequent 30 years; similarly, the salary jumps by about $50,000 (from $160,000 to $210,000), and only by a further $20,000 over the subsequent 30 years. Interestingly, entering the hedge fund industry is associated with a considerably greater career advancement than switching employer earlier in one's career, which coincides with an average increase of 0.42 notches in job level and $20,000 in salary.

[Insert Figure 5]

To assess whether the career advancement associated with entry in the hedge fund industry is related to the characteristics of the employees being hired and those of the corresponding fund, we estimate the following regression (in the most complete specification):

$$\begin{aligned} y_{it} &= \beta_1 education_i + \beta_2 experience_{it} + \beta_3 AM\_experience_{it} + \beta_4 gender_i + \beta_5 y_{it-1} \\ &\quad + \gamma_1 r_{jt-1} + \gamma_2 b_{jt-1} + \gamma_3 aum_{jt-1} + \gamma_4 style_j + \lambda_c + \epsilon_{it}, \end{aligned} \tag{1}$$

where y_{it} denotes the change in either the job level or the salary of individual i upon being hired by a hedge fund company for the first time in year t, $education_i$ is a

dummy equal to 1 if individual i has a graduate degree from a top-15 university and to 0 otherwise; $experience_i$ is the number of years since entry of individual i in the labor market, and $AM\_experience$ is the number of years spent working in the asset management industry; $gender_i$ is a dummy variable equal to 1 for females and 0 for males; r_{jt} is the average performance of fund j relative to its benchmark in the three years before the hiring of individual i; b_{jt} is the average return of the benchmark of fund j over the same interval; aum_{jt-1} is the logarithm of the assets under management of the hiring fund j; $style_j$ is a set of six dummies capturing the investment style of the hedge fund, and λ_c are fixed effects for three cohorts, formed by people who entered the labor market before 1990, between 1990 and 2000, and after 2000 respectively. The specification allows the baseline impact of being hired by a hedge fund company on the job level (or wage) to vary depending on the individual's previous job level or wage y_{it-1}, as individuals who start from a high position are likely to have less room for promotion.

Table 4 shows the coefficient estimates of equation (1). The dependent variable is the job level in Panel A and the salary in Panel B. In each panel, column 1 reports the estimates for a simple specification that includes only employee characteristics, column 2 adds the performance and benchmark of the relevant hedge fund, column 3 also includes the size and style of the hedge fund, and column 4 also cohort dummies. The *education* variable captures not only the level but also the quality of education, and therefore can be regarded as a measure of the observable component of employees' talent. Hence, the positive and significant estimate of β_1 (in all four specifications and in both panels) can be read as evidence that talent is rewarded in the hedge fund industry: a graduate degree from a top-15 university is associated with a job level 1/3 of a notch higher and a \$16,000 annual salary increase. The career and salary progress upon entering the hedge fund industry is also positively and strongly related to the employee's *experience*, and even more with the time spent working in asset management: the premium associated with ten years of previous experience in the industry is about as large as that conferred by high-quality education. In line with much evidence about the gender gap in finance (Adams and Kirchmaier (2016), Bertrand et al. (2010) and Bertrand and Hallock (2001)), the career progress of women upon entering the hedge fund industry is half a notch lower than that of men, and their salary increase is between \$9,000 and \$16,000 lower depending on the specification.

[Insert Table 4]

The job level change is also positively and significantly correlated with the previous relative performance of the hedge fund to which the individual is assigned, while in the salary regressions the coefficient of past relative performance is not significantly different from zero. A possible interpretation of these findings is that stronger fund performance relative to the competition enables the parent investment company to offer more attractive positions to new hires, either because it attracts larger net inflows from investors (thus enabling a greater workforce expansion) or because it induces the company to reward its employees with internal promotions. In other words, funds with stronger relative performance have more muscle on the managerial labor market than weaker ones.[6] This also applies to hedge fund classes as a whole: both the job level and the salary change are positively correlated with the benchmark return of the relevant fund, although the relevant coefficients are not always precisely estimated. Fund size appears to contribute to the salary of newly hired employees, but not to their career advancement upon being hired.[7]

To summarize, our data are consistent with the common wisdom that hedge fund managers are very well paid, even when benchmarked against their previous pay in other segments of the finance industry. However, the evidence also highlights that their career and salary premia at least partly reflect their "merit", as captured by the quality and level of their education, and their experience in asset management. Hence, the market for hedge fund managers appears to reward talent, to some extent. The next section investigates whether the labor market also punishes them for low performance, by reassessing their ability and demoting them accordingly.

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[6]In the asset management literature, there is evidence that institutional investors hire managers who previously generated large positive excess returns, although this return-chasing behavior does not appear to result in subsequent excess performance (Goyal and Wahal, 2008; Busse et al., 2010).

[7]In unreported regressions, we investigate whether career advancement and salaries are significantly correlated with fund performance also after the hire, and find no evidence for such further association. However, this is likely to reflect the fact that such correlation is already built into the pay-for-performance structure of hedge fund managers' contracts, and therefore is entirely captured by the variable component of employee compensation (such as bonus pay), which we do not observe. In fact, we find that there is a significant positive correlation between the career advancement of individuals when they enter the hedge fund industry and the subsequent performance of the fund in which they work. This suggests that, on average, individuals who experience a larger leap in their base salary at the entry stage are also likely to earn higher bonus pay subsequently.

4 Career Paths after Fund Liquidations

In this section, we investigate whether the career path of asset managers changes significantly after the liquidation of the funds where they work, relative to asset managers who do not experience liquidation. Hedge funds are particularly suited to analyze the issue at hand, as their typical performance is very volatile and they are often liquidated, especially upon unsatisfactory performance: 31% of the hedge funds reported in the TASS database between 1994 and 2014 end up being liquidated. Specifically we ask whether, upon the liquidation of a hedge fund, the subsequent labor market options of the employees that work for that fund are negatively affected and, in particular, if this effect is stronger for high-ranking managers, who have more to lose if displaced from their current job.

As we shall see, we find evidence for the presence of such "scarring effect" of liquidations, especially for high-ranking employees. It should be noticed that, by construction, our sample is biased against revealing any scarring effects, since our data tend by construction to over-sample talented and successful professionals, who can be expected to be more careful in updating their biographical information on professional websites. Hence, the effects that we estimate can be expected to be a lower bound of the true ones.

In principle the scarring effect of fund liquidations may stem from one of two, possibly not mutually exclusive, reasons. First, the liquidation may trigger a loss of reputation for the affected asset managers, with negative repercussions on their subsequent careers. We refer to this as the "market discipline" hypothesis. Second, fund managers may suffer a career slowdown after a liquidation because this happens to destroy their fund-specific human capital: they may find it difficult to find a new position at the same level and pay as the previous one, for instance because there are no vacancies to fill for jobs with similar characteristics. We label this the "career risk" hypothesis.

To distinguish between these two hypotheses, we exploit the fact that they predict that liquidations should entail scarring effects in different circumstances. For the "market discipline" hypothesis, liquidation should trigger a slowdown in a manager's career only when it occurs in the wake of under-performance by the fund relative to its benchmark, provided such under-performance conveys information about the manager's quality. This should be the case if under-performance persists over a

sufficiently long period, so that it does not merely reflect high-frequency noise.

The "career risk" hypothesis instead predicts that a liquidation can be associated with scarring effects even when a fund performed broadly in line with its benchmark. For instance, such effects may occur when the benchmark itself performed poorly, inducing investors to withdraw funds from the relevant investment class and triggering fund liquidations. In this case, liquidations convey no information about the quality of managers, yet these may suffer a slowdown in their subsequent career because of the loss of fund-specific human capital. Even when a liquidation is triggered simply by the attainment of the fund's planned terminal date or by an internal reorganization of the parent investment company, it may lead to a loss of human capital for the affected fund managers. For instance, the reorganization may lead the investment company to exit altogether from the fund class in which the manager is specialized, making her redundant and forcing her to accept a lower-level position elsewhere.

In what follows, we first document that fund liquidations are associated with scarring effects (Section 4.1), and investigate whether such effects are larger for high-ranking employees. Next, we test whether such scarring effects are a reflection of "market discipline" or the materialization of "career risk", or both (Section 4.2).

4.1 Scarring Effect of Liquidations

In order to assess whether fund liquidations have negative effects on the subsequent time path of employees' job levels or salaries, we use a diff-in-diff framework, where we compare the evolution of careers for employees that experience liquidation at different dates with that of similar employees who do not. This strategy allows us to control for unobserved talent by including individual fixed effects, and for the differences in individual career paths associated with observable differences in education, experience, gender and initial job level by building a control sample matched on such characteristics. Both of these are important, in order to clear the ground from the possible correlation between fund liquidations and career outcomes induced by assortative matching between funds and managers: liquidated funds may have been managed by less talented employees, who would have had a lackluster career even if their funds were not liquidated. Individual fixed effects remove the impact of differences in unobserved talent on job levels and salaries, while the matching procedure filters out the influence of observed characteristics on career paths.

In addition, there is substantial variation in the timing of funds' liquidations, as illustrated by Figure 6: even though there are peaks that coincide with the market turbulence of 2008-10 and 2011, many liquidations occur also in normal times. This strengthens the external validity of our estimates: if liquidations occurred only in financial crises, their scarring effects might be compounded by the fact that at these times the labor market is particularly unfavorable for employees who seek a new job after their fund's liquidation.

[Insert Figure 6]

We define the event of interest as the first time an employee experiences a fund's liquidation, which in our sample occurs for 429 employees (out of a total of 1627). The TASS database reports eight different reasons why funds exit its database of "live funds" (and enter its separate "graveyard" database), of which fund liquidation is the most frequent (48.44%).[8]

Each individual that experiences liquidation is matched with a control individual in the calendar year before liquidation, via a propensity score matching. The matching algorithm that we use is one-to-one nearest neighbor matching without replacement, and the propensity score is based on education, experience, education quality, gender, job level and change in job level in the year before the liquidation. This provides a counterfactual career development, namely, the time path that the job level, salary or company switches would have followed in the absence of liquidation. After the matching procedure, we are left with 365 individuals in the sample of liquidated funds, and as many in the control sample.

Our specification controls for individual effects and for time effects:

$$y_{it} = \alpha_i + \lambda_t + \sum_{k=-5}^{5} \theta_k L_{it}^k + \epsilon_{it}, \tag{2}$$

where y_{it} is the variable of interest, namely, the job level, salary or switch to a new employer, α_i are individual fixed effects, λ_t are year effects (relative to the liquidation year, defined as $t = 0$), and $L_{it}^k = L_i \times \mathbf{1}(t = k)$ are a set of 11 dummies, each of

[8]The other reasons are (i) "fund no longer reporting" (22.33%); (ii) "unable to contact fund" (18.58%), (iii) "fund has merged into another entity" (6.02%); (iv) "fund closed to new investment" (0.96%), (v) "fund dormant" (0.59%), (vi) "programme closed" (0.54%), and (vii) "unknown" (2.54%)

which equals 1 k periods before or after the liquidation if individual i experiences it ($L_i = 1$), and 0 otherwise.

We normalize the value $\theta_{-1} = 0$ to gain identification of the sequence of θ_k, which can be interpreted as the change in the outcome (e.g., the job level) from the year before the event to k periods after (or before) its occurrence, relative to individuals who did not experience a fund liquidation. Our empirical strategy requires that before the liquidation event there is no trend in the outcome variable (e.g., the job level). If this assumption is valid, θ_k should be approximately zero for $k < 0$. Instead, any effects of the liquidation should emerge as estimates of θ_k significantly different from zero for $k \geq 0$.

We use data about careers for 5 years prior and after the liquidation event, so as to avoid the endpoints of the leads and lags being a mixture of further leads and lags. Since Baghai et al. (2017a) show that talented workers tend to leave their companies when these approach bankruptcy, we include among the employees affected by liquidations those that were employed in the relevant fund in a two-year window prior to the event. This avoids the selection bias that may be induced by considering only employees that still work in the fund when it gets liquidated.

Clearly, different θ_k are estimated using different samples, because sample composition is subject to changes over time. For example, asset managers that experience fund liquidation early in their career are not observed several years prior to the event, while those that experience liquidation at the end of their career are not observed several years after the event. In order to mitigate this concern, as a robustness check, we also estimate equation (2) using a balanced sample of managers in the funds that get liquidated.

The resulting estimates are shown in Figure 7 for the job level, in Figure 8 for the salary and in Figure 9 for employer switches, for an interval of 11 years centered around the liquidation year. Each figure shows the paths of these three outcome variables for the liquidated and control groups in the upper panel, and the corresponding differences (i.e., the estimated θ_k) with their 95% confidence intervals in the lower panel. None of the three outcome variables features significant pre-liquidation trends, i.e. the coefficients θ_k are not significantly different from zero for $k < 0$, as required for the validity of our empirical strategy, while they are significantly different from zero thereafter.

[Insert Figures 7, 8 and 9]

In particular, both the job level and the salary drop significantly after the liquidation, without significant reversion to their pre-liquidation level. The job level drops by 0.2 notches in the two years after liquidation, and then remains at this lower level in the subsequent three years. The evidence for the salary is similar: by the second year after liquidation, it drops by about $10,000 below the pre-liquidation level, and remains at this lower level in the subsequent three years. On the whole, Figures 7 and 8 suggest that individuals working for liquidated funds experience a significant and durable career slowdown.

The post-liquidation career slowdown is accompanied by an increased probability of switching to a new employer. For employees who hold jobs in more than a single company, a switch occurs when any of her employers changes. Importantly, moving across funds managed by the same parent company does not qualify as a switch, given that the employment relationship is at the company level, not at the fund level. The probability of switching to a new employer, i.e. job mobility, rises by 10 percentage points in the year after the liquidation, as shown in Figure 9.[9]

To test whether high-ranking employees are hurt more than others in the years following a liquidation, we repeat the analysis described above separately for two groups: professionals holding high-ranking positions (job levels 5 and 6), and those with medium-level jobs (levels 3 and 4) prior to the liquidation. The classification is made on the basis of the position held two years before the liquidation (rather than the year just before it) in order to test for the presence of possible anticipated effects of the liquidation on the individual's job level. Also in this case, the estimates are based on observations for 11 years centered on the liquidation year, both for employees of liquidated funds and for those of the control sample. The top panel of Figure 10 displays the job level paths for high-ranking employees of liquidated funds and for the respective control group. The two groups of employees advance at the same pace towards top jobs (level 6) before liquidation, but diverge afterwards: the

[9]In unreported regressions, we test whether careers feature a significant slowdown when individuals face for the first time a fund termination occurring for reasons other than liquidation, and specifically because, according to the TASS database, the fund is merged into another entity, closed to new investment, becomes dormant or its program is closed. We find no significant changes in the career paths of professionals following these events. The scarring effects documented in this section are thus associated with liquidations, and not with the mere fact that the fund is dropped from the TASS database of live funds.

employees of liquidated funds gradually drop by 0.4 notches over the subsequent 5 years, while those of the control group remain almost at the same level. The middle panel of the figure shows that instead no difference is present for the post-liquidation career paths of employees holding mid-level positions: their career keeps advancing at the same rate as that of employees in the control sample. The bottom panel shows that the differences in the post-liquidation career paths of high and mid-level employees relative to their respective controls (i.e. the differences in their estimated θ_k) are significantly different from zero. While the two top panels describe how job levels change differentially after liquidation for employees starting from a given job level, the bottom panel shows the difference between the effect of liquidation for employees starting from top levels and for those that start from mid level jobs and the corresponding 95% confidence intervals.

[Insert Figure 10]

Figure 11 shows similar results for the salary of the two groups of employees: their salaries feature parallel trends before the liquidation year, but after the liquidation only high-ranking employees face a steady decline in compensation, the drop relative to their peers in non-liquidated funds being $18,538 after 5 years (statistically significant at the 10% level).

[Insert Figure 11]

Also job mobility increases significantly after liquidations only for high-ranking employees: as shown by Figure 12, for these employees the probability of switching to a new employer increases by 15% more than for mid-level employees in the liquidation year, almost 20% in the subsequent year, and about 15% more in the second year after the liquidation. Hence, the differential increase in the probability of switching employer over the three-year interval is about 50%.

In summary, there is evidence that hedge fund liquidations entail significant and persistent scarring effects, and that these mainly affect high-ranking employees. *Per se*, this result does not help us to discriminate between the "market discipline" and the "career risk" hypotheses. One could argue that, because of their decision-making power, high-ranking employees are those whose reputation might suffer most from the liquidation of their fund. However, they are likely to be also those with most fund-specific human capital at stake: they may have developed portfolio strategies, client

relationships and work habits that cannot be easily transplanted when switching to a new job, possibly outside the hedge fund industry or even the finance industry altogether. Hence, they may stand to lose more than employees in low or medium-level positions, which require fewer fund-specific skills. So, the lack of a scarring effect for medium-ranked professionals does not allow us to reject the "career risk" hypothesis.

The scarring effects implied by our estimates for top-level employees may appear modest compared with the frequent loss of CEO status by the executives after bankruptcy reported by Eckbo et al. (2016). This difference may be explained by the fact that hedge fund liquidations are far less dramatic events than firm bankruptcies: as investment companies typically manage a family of hedge funds, they can keep operating even after liquidating one of their funds. Hence the employees working for a liquidated fund can be retained by the same employer, and even reassigned to another fund with the same job level. Indeed the effects of fund liquidations differ markedly for employees that are retained by their employer and those who switch to a new one. This is shown by Figure 13, which is obtained by replicating our event study separately for the 114 employees who switch to a new company within a year from the liquidation and for the 251 ones that do not (some of which however switch in subsequent years). The top two panels indicate that for "switchers" the scarring effects of liquidations are large and significant, while the bottom two panels show that "non-switchers" experience no significant changes in their subsequent labor market performance. In fact, the post-liquidation effects experienced by the "switchers" are much larger than those shown for all employees of liquidated funds in Figures 7 and 8: the job level of "switchers" drops by 0.5 (as opposed to 0.2) notches and their salary drops by about $20,000 (as opposed to $10,000).

[Insert Figure 13]

Hence, for employees who are displaced after a fund liquidation, career effects are more similar to those reported for the executives of bankrupt firms. However, also the scarring effects experienced by employees leaving the company after a fund liquidation are consistent with two possible explanations. One is that they are laid off, being held responsible for the fund's under-performance. An alternative interpretation is that they just face greater frictions (e.g. search costs, switching to a new sector) to find a new job compared to employees that are retained by their initial employer.

Hence, also for these employees the scarring effects of liquidations are potentially consistent with both the "market discipline" and the "career risk" hypothesis.

4.2 Causes of Scarring Effects

To shed light on the rationale of the scarring effects of liquidations, we explore whether the impact of fund liquidations on careers varies depending on the fund's relative performance prior to liquidation. According to the "market discipline" hypothesis, a fund liquidation should tarnish the reputation of its managers only if it follows poor performance of the fund relative to its benchmark, and only if such under-performance can be seen as informative of the managers' quality, rather than an occasional unlucky draw. Only in such case, therefore, one should observe negative repercussions of the liquidation on employees' subsequent careers.[10] The "career risk" hypothesis, instead, predicts that liquidations may affect managers' subsequent careers also in other circumstances, for instance following a sharp drop in their benchmark return or upon a reorganization of the parent investment company: also in such instances the employees of liquidated funds may lose skills acquired while working in the fund (beside possibly suffering psychological distress), and thus become less productive in their subsequent jobs. According to the first story, liquidations reflect at least partly the employee's quality and effort, while in the second they simply result from bad luck.

To test whether funds' relative performance before liquidation affects the post-liquidation career slowdown of the affected professionals, we estimate the following variant of equation (2):

$$y_{it} = \alpha_i + \lambda_t + \theta L_{it}^{post} + \gamma L_{it}^{post} \times P_{it}^{-} + \epsilon_{it}, \tag{3}$$

where α_i is an individual fixed effect, λ_t is a time effect, L_{it}^{post} is a liquidation dummy that equals 1 in the liquidation year and in the 5 subsequent years (for funds that are liquidated) and 0 otherwise, and P_{it}^{-} is a "low performance" indicator, namely, a dummy variable that equals 1 if the liquidation follows a period (alternatively, 6 months, 1 year or 2 years) in which the fund's average monthly return fell short of the

[10] Brown et al. (2001) document that poor relative performance increases the probability of hedge fund termination.

relevant benchmark return.[11] Hence, the coefficient θ measures the effect of liquidations on career outcomes when these are preceded by good relative performance, and the coefficient γ captures the incremental effect of poor pre-liquidation performance. The rationale for measuring pre-liquidation performance over different time intervals is that its informativeness about the fund managers' quality should be higher for longer intervals, as high-frequency noise in returns gradually abates.

The resulting estimates are shown in columns 1, 2 and 3 of Table 6 respectively for the job level, salary and job mobility. What varies across the three panels of the table is the time interval over which the relative performance before liquidation is measured. In the regressions shown in the top panel, performance is measured over the 6 months before liquidation; in the middle panel, it is measured over 1 year; in the bottom panel, over two years. The estimates of the coefficient θ are small and not significantly different from zero in the job level and salary regressions (columns 1 and 2), irrespective of the length of the period over which pre-liquidation performance is measured: hence, when their prior performance is good, liquidations are not associated with scarring effects. Instead, the estimates of the coefficient γ in these two regressions rise in absolute value from the top panel to the bottom one, where they also become significantly different from zero. This indicates that, as time-averaging raises the signal-to-noise ratio in pre-liquidation performance, the scarring effects of liquidation following under-performance become larger and more precisely estimated, consistently with the market discipline hypothesis. A liquidation following two years of low relative performance is associated with a subsequent job level drop of 0.25 notches and a salary drop slightly over $10,000, in line with the estimates associated with the liquidation event *per se* in Figures 7, 8 and 9.

[Insert Table 6]

In contrast, the effects of liquidation on job mobility do not appear to vary depending on performance: the estimates shown in column 3 of the table indicate that liquidation is followed by a 5 to 6 percentage points increase in the probability of switching to a new employer, without a significantly difference when liquidation is

[11] This specification does not include separate time effects for the two subsamples of control employees (those matched with employees of under-performing liquidated funds and those matched with employees of well-performing ones), because the trends of the outcome variables do not differ across the two groups.

preceded by low performance. Also fund liquidations that carry no information regarding the affected employees, such as those triggered by the reorganization of the parent investment company, induce some employees to switch to other companies offering more suitable jobs. By the same token, the employees affected by liquidations preceded by poor performance (and by the associated reputation loss) face the same probability of switching to a new employer, but suffer a career slowdown. This squares with the idea that their career setback does not simply stem from the frictions associated with the switch to a new employer.

Recall that the previous subsection documents that only high-ranking employees face a significant career slowdown after fund liquidations, mid-level employees being unaffected. According to the evidence in Table 6 such career slowdowns occur only in the wake of persistent pre-liquidation under-performance. Hence, taken together, these two findings suggest that a post-liquidation career slowdown should occur only for high-ranking employees of under-performing funds, and not those of well-performing funds. Investigating this joint hypothesis provides a sharper test of the view that the career slowdown arises from a loss of reputation of these high-raking employees. To implement this test, we re-estimate equation (3) separately for high- and mid-ranking employees. In order to account for differences in trends between the control groups matched to professionals working in under-performing funds and those matched to professionals working in well-performing funds, we include group-specific time effects. The results are reported in Table 7.

[Insert Table 7]

The estimates indicate that only high-ranking employees (namely, those with level-5 or level-6 jobs two years before liquidation) whose funds were liquidated after under-performing their benchmarks for 2 years suffer a post-liquidation career slowdown. Panel A of Table 7 reports the estimates for high-ranking employees, while Panel B reports those for employees holding a mid-level position (i.e. a level-3 or level-4 job) two years before the liquidation. Columns 1, 2 and 3 show the results for the job level, salary and job mobility, respectively.

For top-level employees, liquidations occurring after normal performance are not followed by significant changes in either the job level or the salary. Instead, liquidations occurring after persistent under-performance are associated with significant scarring effects for top-level employees: the interaction between liquidation and low

performance is negative and significant in both the job level and the salary regressions. After liquidation, for top employees of under-performing funds the job level drops by about 0.3 notches more than for top employees of well-performing funds, and the salary falls by about $14,000 more. In contrast, the job mobility of top employees increases after liquidation irrespective of previous fund performance: the probability of switching to a new employer increases by 11 percentage points in the years following liquidations of well-performing funds. Hence, in the wake of fund liquidations, top managers do move to other companies, yet only those who do so after persistent fund under-performance see their subsequent career being hurt. No significant effects are detected instead for mid-level employees. So the evidence is consistent with the hypothesis that liquidations trigger a career slowdown for employees that can be held responsible for their fund's low performance.

To sum up, the thrust of the evidence is consistent with the idea that the scarring effects of fund liquidations are mostly the result of "market discipline" rather than the materialization of "career risk", as they penalize only employees with substantial decision-making power over funds that persistently under-performed prior to liquidation.

5 Conclusions

In this paper we find that, while finance professionals experience a great acceleration in their careers upon entering the hedge fund industry, they face significant career setbacks and are more likely to switch to other employers following the liquidation of the fund they work for.

This "scarring effect" affects only high-ranking employees of the relevant investment companies, and only those whose funds significantly and persistently underperform their respective benchmarks. Hence, the post-liquidation career slowdown appears related to the reputation loss of high-ranking employees in formerly underperforming funds, rather than to the disruption of their fund-specific human capital induced by liquidation.

On the whole, our results reveal a new facet of market discipline in asset management, which operates via the managerial labor market: persistent under-performance followed by the fund's liquidation exposes the managers of the fund's parent com-

pany to a permanent setback in their subsequent career and compensation. Hence, the managerial labor market provides incentives that complement those that exist within the firm's boundaries, such as performance-sensitive compensation, and indeed may partly compensate the tendency to index asset managers' pay more to upside than to downside risk.

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Table 1: Job Levels and Salaries

This table illustrates the two dimensions along which we characterize the employment positions of the individuals in our sample: their job level, i.e. its rank within the corporate hierarchy, and the typical salary associated with their job title and sector. Job levels are identified by first matching the job titles reported by individuals in their curricula with the Standard Occupational Classification (SOC) produced by the Bureau of Labor Statistics (BLS), and then grouping the SOC codes into 6 bins, meant to capture different degrees of decision-making power. To identify the average annual salary associated in 2016 to each SOC code, we use the Occupational Employment Statistics (OES), taking into account salary variation across the following 6 sectors: (i) asset management (AM), (ii) commercial banking and other lending institutions (CB); (iii) financial conglomerates, defined as institutions encompassing lending, insurance and/or asset management (CO); (iv) insurance (IN); (v) other finance, which includes mainly financial consultancies and portfolio advisors (OF); and non-financial firms and institutions, including government, supranational institutions and stock exchanges (NF).

Job Level	Description	2016 Average Salary (USD)	Examples of job titles
6	CEOs	238,628	CEO, executive director, founder, managing director, managing partner
5	Top executives	233,207	CFO, CIO, COO, CRO, deputy CEO, partner, vicepresident
4	First/Mid Officers & Managers	180,710	director of sales, head of investor relations, investment manager
3	Professionals	115,667.1	analyst, portfolio manager
2	Technicians, Sales Workers, Administrative Support Workers	106,254	trader, credit officer
1	Craft Workers, Operatives, Labors & Helpers, Service Workers	22,500	assistant, intern

Table 2: Descriptive Statistics

The table provides statistics about the characteristics of the individuals in our sample, based on data drawn from individual resumes available on a major professional networking website, together with information available on Bloomberg, Businessweek and companies' websites. Education Level variables are indicators for the highest degree held by the professional. Subject variables are indicators for the subject of the highest degree held by the professional. The quality of highest degree is defined on the basis of QS Ranking, building three indicators for whether the university where the professional obtained her highest degree ranks among the top 15, 16-40 or below 40, respectively. Cohort dummies are defined on the basis of the starting date of the first job reported in the resume. Sector variables are dummies that equal 1 if the professional works in that sector, and 0 otherwise. AM stands for asset management; CB for commercial banking and other lending institutions; CO for financial conglomerates; IN stands for insurance; OF for other financial companies and NF for non-finance companies. The job level is meant to capture different degrees of decision making-power and takes values from one (bottom of the hierarchy) to six (CEO). Salary is the average annual salary associated in 2016 to each SOC code in the six sectors described above. CEO is a dummy variable indicating whether an individual is a CEO (=1) or not (=0). Company Switch is an indicator for whether an individual at time t reports to work for another company relative to the previous year. For some variables, fractional shares do not sum to 1 due to the presence of missing observations.

	Obs.	Mean	Median	St. Dev.
Education Level				
High school	1,627	0.00	0	0.06
College	1,627	0.40	0	0.49
Master	1,627	0.42	0	0.49
JD or PhD	1,627	0.03	0	0.16
Subject and Quality of Degree				
Econ or Finance	1,627	0.60	1	0.49
Science or Engineering	1,627	0.08	0	0.27
Ranked top 15	1,627	0.17	0	0.37
Ranked 16-40	1,627	0.07	0	0.25
Ranked below 40	1,627	0.42	0	0.49
Cohort				
1962-1979	1,627	0.04	0	0.19
1980-1989	1,627	0.21	0	0.41
1990-1999	1,627	0.46	0	0.50
2000-2013	1,627	0.29	0	0.45
Male	1,576	0.84	1	0.37

Table 2: continued

	Obs.	Mean	Median	St. Dev.
Sector				
AM	34,768	0.71	1	0.45
CB	34,768	0.07	0	0.25
CO	34,768	0.01	0	0.09
IN	34,768	0.02	0	0.13
OF	34,768	0.02	0	0.16
NF	34,768	0.17	0	0.38
Careers variables				
Job Level	35,006	4.53	4	1.38
Salary, USD	34,818	189,082.73	217,950	59,433.99
CEO	35,006	0.40	0	0.49
Company Switch	35,006	0.13	0	0.33

Table 3: Fund Performance Measures

The table presents summary statistics for the yearly returns of hedge funds in the TASS database. Hedge funds are classified according to their strategies, as described by TASS and grouped in 6 classes (columns 1-6). Panel A shows the mean and standard deviation of yearly percentage return of the benchmarks, defined as the average yearly return of the funds in the respective class for the whole sample period. Panel B shows the average range of variation of fund relative performance, defined as the difference between a fund's yearly percentage return and the yearly percentage return of the respective benchmark, and the number of funds in each class.

	Relative Value	Security Selection	Multi-process	Directional Traders	Fund of Funds	Other
Panel A: Benchmark Returns (%)						
Mean	10.1	20.9	15.1	23.8	14.6	18.6
St. Dev.	9.9	18.2	10.3	30.7	17.8	24.8
Panel B: Fund Relative Performance (%)						
Range	162.2	951.2	1,656.8	345.6	516.4	493.8
N. funds	1,106	5,614	4,147	2,497	7,105	2,230

Table 4: Job Level Change upon Hiring

The table presents the estimated relationship between changes in job level upon hiring and individuals' and hedge fund characteristics. Job Level ranges from 1 (bottom of the hierarchy) to 6 (CEO). Education Quality is a dummy equal to 1 if the individual has a graduate degree from an institution ranked among the top 15 universities according to QS and 0 otherwise. Experience is the level of experience of the individual at the time of hiring. Exp in AM is the number of years of work experience in asset management before being hired by a hedge fund company. Gender is a dummy equal to 1 for females and 0 for males. Past Performance is the average difference between fund j's percentage return and the average return of its benchmark in the three years before hiring, and Past Benchmark is the average percentage return of all the funds in j's class in the three years before hiring. Log(AUM) is the logarithm of the average assets under management of fund j. Fund Style is a set of six dummies capturing the investment style of the hedge fund, and cohort fixed effects correspond to people who entered the labor market before 1990, between 1990 and 2000, and after 2000 respectively. Robust standard errors are shown in parentheses below the respective coefficients:* denotes $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

	(1)	(2)	(3)	(4)
Education Quality	0.325***	0.387***	0.342**	0.322**
	(0.092)	(0.148)	(0.150)	(0.151)
Experience	0.014**	0.019*	0.015	-0.004
	(0.007)	(0.010)	(0.011)	(0.012)
Exp in AM	0.021***	0.035***	0.040***	0.040***
	(0.007)	(0.010)	(0.011)	(0.011)
Gender	-0.584***	-0.436***	-0.399***	-0.380***
	(0.074)	(0.103)	(0.113)	(0.115)
Previous Job Level	0.122***	0.110***	0.119***	0.109***
	(0.020)	(0.032)	(0.034)	(0.034)
Past Performance		0.053**	0.046*	0.044*
		(0.026)	(0.026)	(0.026)
Past Benchmark		0.155**	0.124*	0.055
		(0.067)	(0.070)	(0.072)
log(AUM)			0.003	0.003
			(0.028)	(0.027)
Constant	4.211***	3.807***	4.216***	4.551***
	(0.069)	(0.135)	(0.564)	(0.562)
Cohort FEs	No	No	No	Yes
Fund Style	No	No	Yes	Yes
Observations	1627	645	584	584

Table 5: Salary Change upon Hiring

The table presents the estimated relationship between changes in salary upon hiring and individuals' and hedge fund characteristics. Education Quality is a dummy equal to 1 if the individual has a graduate degree from an institution ranked among the top 15 universities according to QS and 0 otherwise. Experience is the level of experience of the individual at the time of hiring. Exp in AM is the number of years of work experience in asset management before being hired by a hedge fund company. Gender is a dummy equal to 1 for females and 0 for males. Past Performance is the average difference between fund j's percentage return and the average return of its benchmark in the three years before hiring, and Past Benchmark is the average percentage return of all the funds in j's class in the three years before hiring. Log(AUM) is the logarithm of the average assets under management of fund j. Fund Style is a set of six dummies capturing the investment style of the hedge fund, and cohort fixed effects correspond to people who entered the labor market before 1990, between 1990 and 2000, and after 2000 respectively. Robust standard errors are shown in parentheses below the respective coefficients:* denotes $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

	(1)	(2)	(3)	(4)
Education Quality	10619.558***	16108.917***	15850.250***	15095.820**
	(3764.593)	(5827.253)	(6063.777)	(6136.514)
Experience	877.461***	1155.652***	941.842**	644.430
	(259.936)	(388.173)	(437.018)	(505.151)
Exp in AM	240.452	679.516*	891.284**	944.379**
	(274.250)	(388.342)	(437.627)	(439.952)
Previous Salary	0.125***	0.117***	0.126***	0.118***
	(0.018)	(0.030)	(0.031)	(0.031)
Gender	-15889.884***	-9267.575**	-8899.700*	-8570.270*
	(3434.144)	(4663.584)	(5106.702)	(5161.658)
Past Performance		834.804	587.410	625.420
		(1072.213)	(1082.090)	(1064.992)
Past Benchmark		7053.705**	5369.700*	4568.874
		(2855.109)	(3016.297)	(3207.971)
log(AUM)			1682.249	1678.633
			(1142.169)	(1141.301)
Constant	177681.111***	162842.626***	150334.465***	157977.514***
	(2886.283)	(5661.693)	(23022.631)	(23119.182)
Cohort FEs	No	No	No	Yes
Fund style dummies	No	No	Yes	Yes
Observations	1620	645	584	584

Table 6: Fund Performance and Career Effects of Liquidations

The table reports estimates for the career effects of liquidations after low relative performance. Liquidation equals 1 in the liquidation year and in the 5 subsequent years (for funds that are liquidated), and 0 otherwise. Low Performance is a dummy variable equal to 1 for funds with average monthly return below the benchmark return in the period before liquidation, and 0 otherwise, the relevant pre-liquidation period being 6 months in Panel A, 1 year in Panel B and 2 years in Panel C. Columns 1, 2 and 3 show the estimated coefficients of the Liquidation dummy and of its interaction with the Low Performance dummy. The equation is estimated using data for 5 years before and 5 years after the liquidation date for the professionals who experience it. Job Level ranges from 1 (bottom) to 6 (top). Salary is the average annual salary associated in 2016 with each SOC code in the six sectors in Table 2. Switch is an indicator for whether in year t an individual is employed by a different company from year $t-1$. The standard errors shown in parentheses are clustered at individual level: * denotes $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

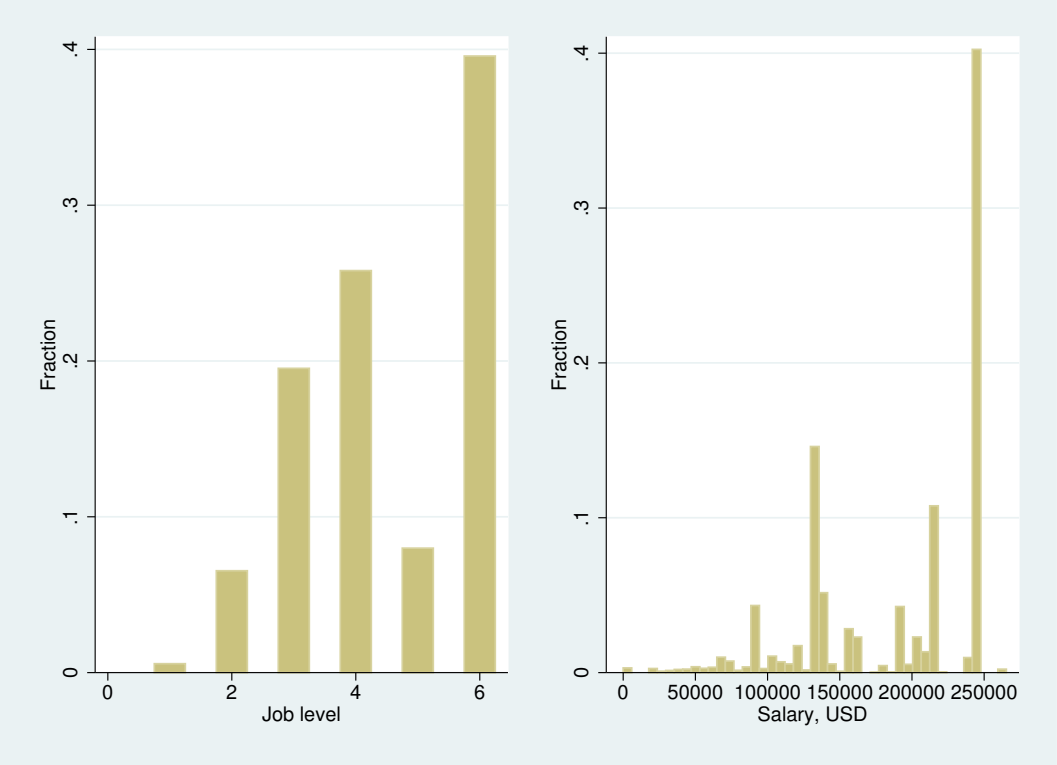
Dependent variable	Job Level	Salary	Switch
	(1)	(2)	(3)
Panel A: 6 months pre-liquidation performance			
Liquidation	-0.052	-4872.561	0.044*
	(0.103)	(4714.398)	(0.023)
Liquidation×Low Performance	-0.090	-1575.079	0.012
	(0.114)	(5161.654)	(0.023)
Panel B: 12 months pre-liquidation performance			
Liquidation	-0.051	-3064.145	0.061**
	(0.111)	(4797.034)	(0.026)
Liquidation×Low Performance	-0.085	-3750.431	-0.011
	(0.120)	(5193.586)	(0.026)
Panel C: 24 months pre-liquidation performance			
Liquidation	0.090	2682.795	0.061**
	(0.135)	(5623.152)	(0.026)
Liquidation×Low Performance	-0.253*	-10618.896*	-0.010
	(0.141)	(5901.730)	(0.027)
Observations	7652	7612	7652

Table 7: Fund Performance and Career Effects of Liquidations, by Job Level

The table reports estimates for the career effects of liquidations after low relative performance, separately for top-level employees (Panel A) and for mid-level ones (Panel B), respectively defined as employees with pre-liquidation job levels 5 or 6, and with pre-liquidation job levels 3 or 4. Liquidation equals 1 in the liquidation year and in the 5 subsequent years (for funds that are liquidated), and 0 otherwise. Low Performance is a dummy variable equal to 1 for funds with average monthly return below the benchmark return in the two years before liquidation, and 0 otherwise. Columns 1, 2 and 3 show the estimated coefficients of the Liquidation dummy and of its interaction with the Low Performance dummy. The equation is estimated using data for 5 years before and 5 years after the liquidation date for the professionals who experience it. Job Level ranges from 1 (bottom) to 6 (top). Salary is the average annual salary associated in 2016 with each SOC code in the six sectors in Table 2. Switch is an indicator for whether in year t an individual is employed by a different company from year $t-1$. The standard errors shown in parentheses are clustered at individual level: * denotes $p < 0.10$, ** $p < 0.05$, and *** $p < 0.01$.

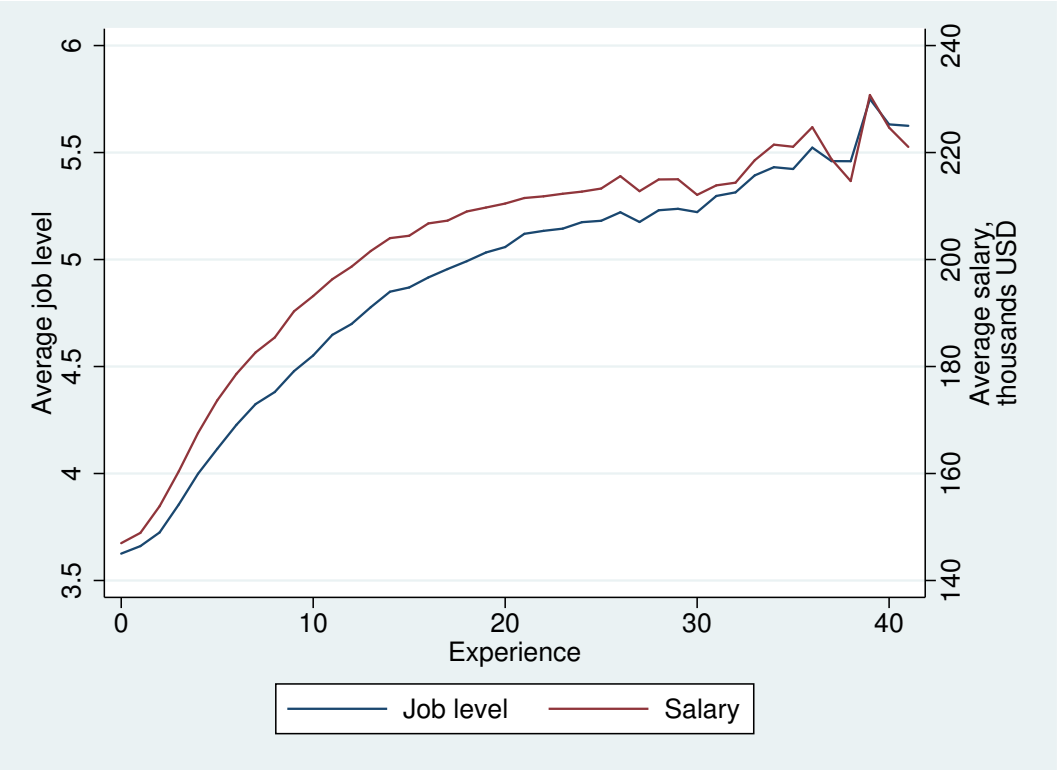
	(1)	(2)	(3)
Dependent variable	Job Level	Salary	Switch
Panel A: Employees starting from level 5 or 6			
Liquidation	-0.099	-933.633	0.113**
	(0.132)	(5061.909)	(0.046)
Liquidation × Low Performance	-0.278*	-14056.653**	-0.045
	(0.157)	(6232.414)	(0.050)
Observations	4075	4038	4075
Panel B: Employees starting from level 3 or 4			
Liquidation	0.237	9690.491	-0.000
	(0.276)	(13725.083)	(0.055)
Liquidation × Low Performance	-0.175	-10891.154	0.022
	(0.297)	(14965.119)	(0.062)
Observations	3222	3219	3222

Figure 1: Distribution of job levels and salaries



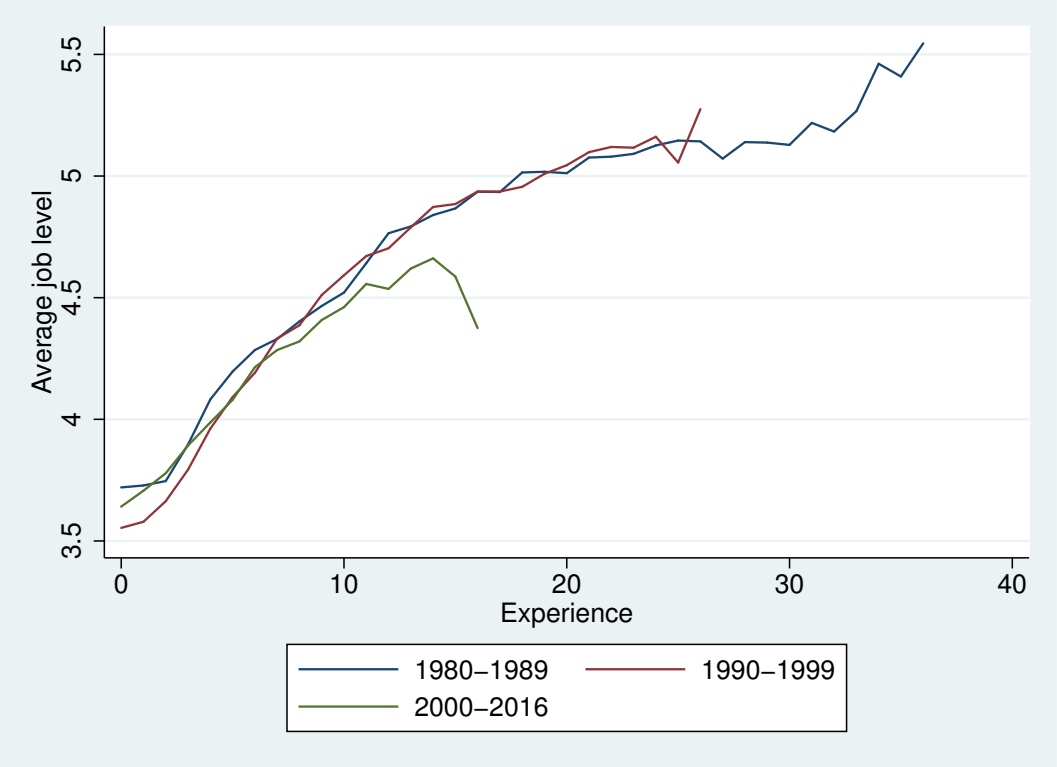
Note. The figure shows the distribution of job levels (left panel) and salaries (right panel). Job levels are classified by first matching the job titles reported by individuals in their curricula with the Standard Occupational Classification (SOC) produced by the Bureau of Labor Statistics (BLS), and grouping the SOC codes into 6 bins, meant to capture different degrees of decision-making power: Craft Workers, Operatives, Labors and Helpers, and Service Workers (coded as 1); Technicians, Sales Workers, and Administrative Support Workers (coded as 2); Professionals (coded as 3); First/Mid Officers and Managers (coded as 4); Top Executives (coded as 5, except for those coded as 6); CEOs, or other positions at the head of the corporate hierarchy (coded as 6). The salary is the average annual salary associated in 2016 to each SOC code in 6 sectors, based on the Occupational Employment Statistics (OES). The sectors are: (i) asset management (AM), (ii) commercial banking and other lending institutions (CB); (iii) financial conglomerates, defined as institutions encompassing lending, insurance and/or asset management (CO); (iv) insurance (IN); (v) other finance, which includes mainly financial consultancies and portfolio advisors (OF); and non-financial firms and institutions, including government, supranational institutions and stock exchanges (NF).

Figure 2: Career profile



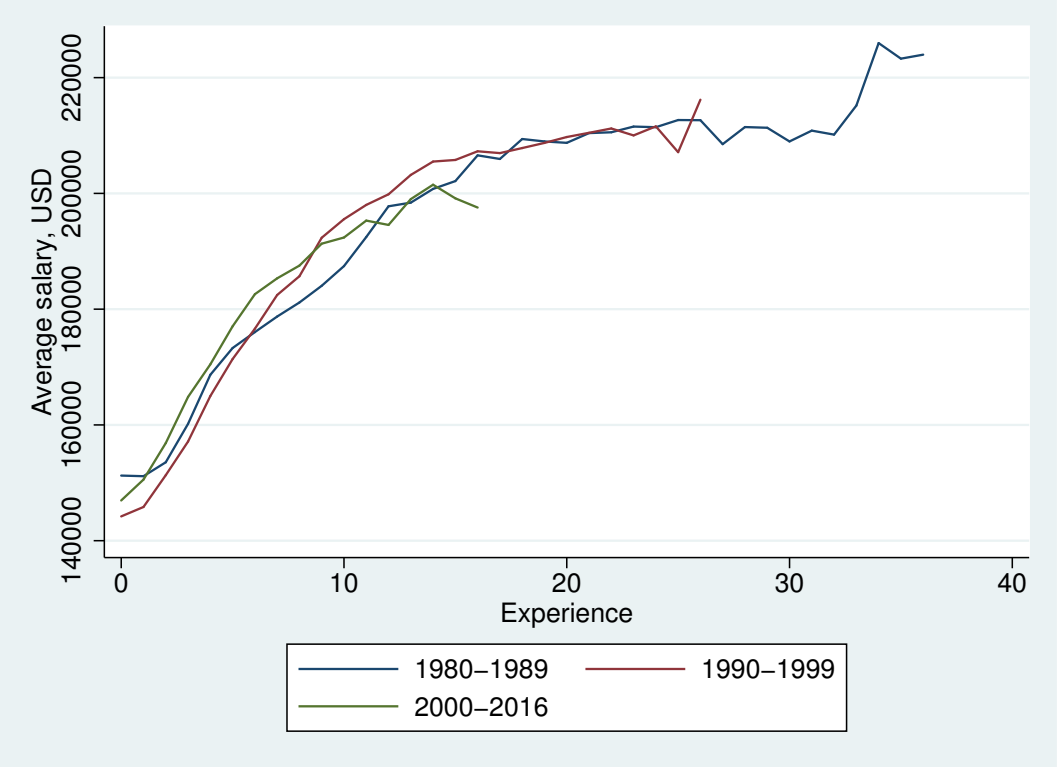
Note. The figure illustrates career paths by plotting the average job level and average salary against work experience for the individuals in th sample. The job level is meant to capture different degrees of decision making-power and takes values from 1 (bottom of the hierarchy) to 6 (CEO). Salary is the average annual salary associated in 2016 to each SOC code in six sectors: (i) asset management; (ii) commercial banking and other lending institutions; (iii) financial conglomerates; (iv) insurance; (v) other financial companies; and (vi) non-finance companies.

Figure 3: Career profile by cohort



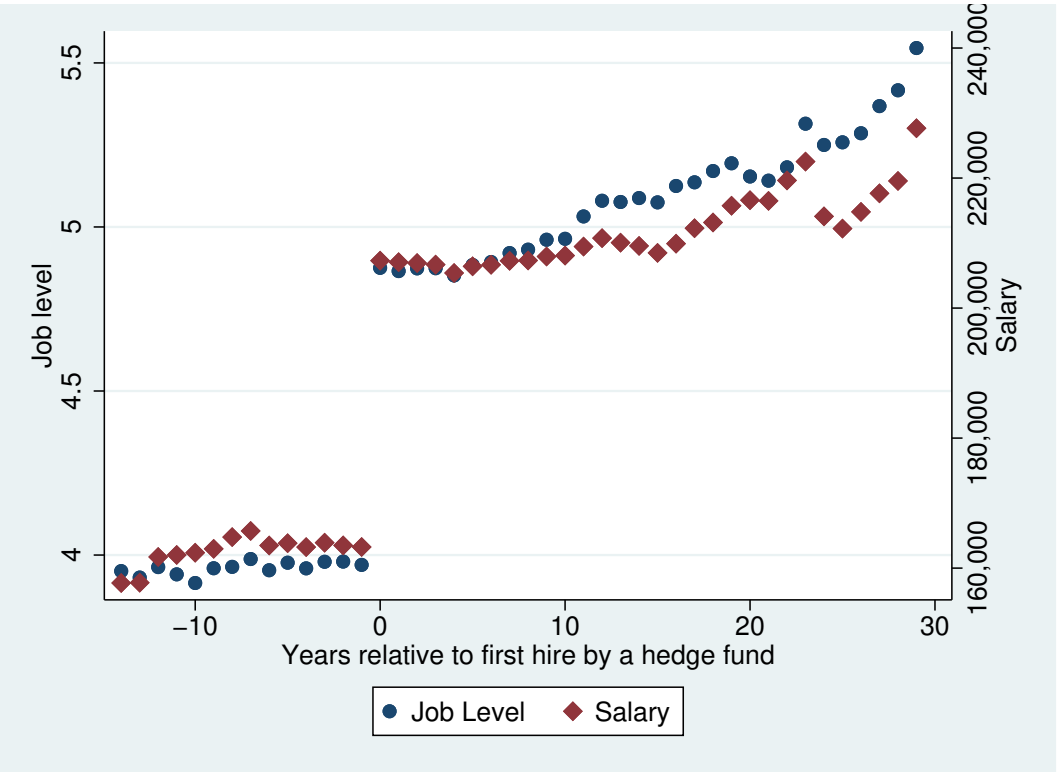
Note. The figure illustrates average job level against work experience by cohort of individuals. The job level is meant to capture different degrees of decision making-power and takes values from 1 (bottom of the hierarchy) to 6 (CEO).

Figure 4: Salary profile by cohort



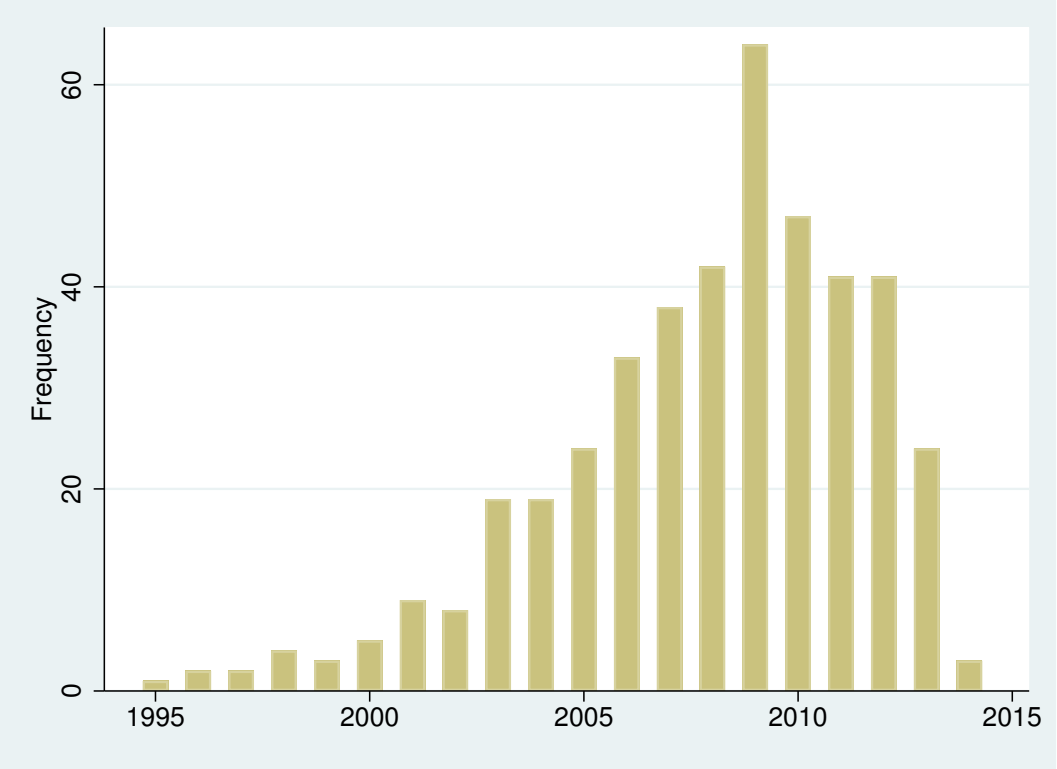
Note. The figure illustrates average salary against work experience by cohort of individuals. Salary is the average annual salary associated in 2016 to each SOC code in six sectors: (i) asset management; (ii) commercial banking and other lending institutions; (iii) financial conglomerates; (iv) insurance; (v) other financial companies; and (vi) non-finance companies.

Figure 5: Entry into the hedge fund industry



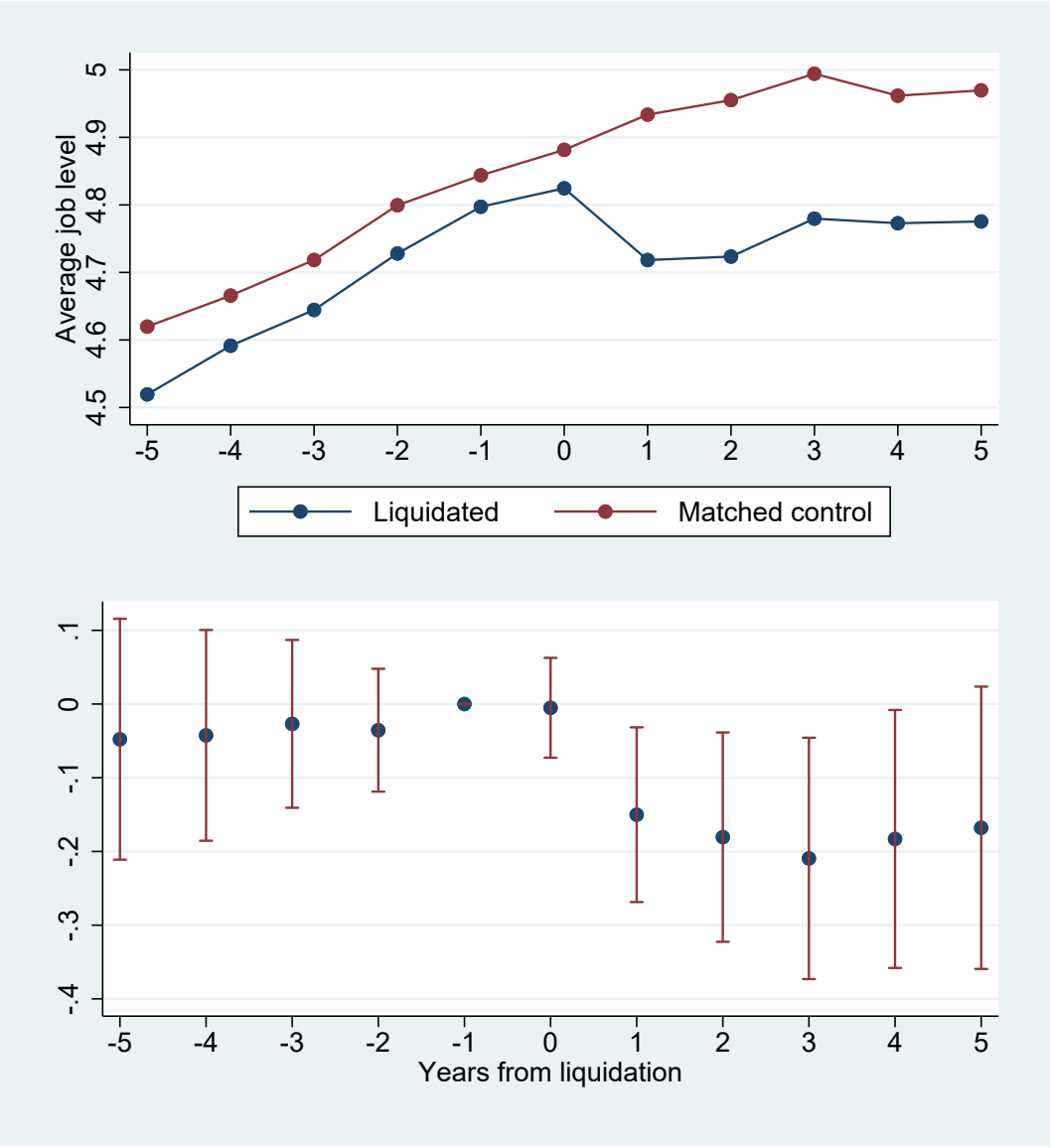
Note. The figure shows average job level (left axis) and average salary (right axis) in the fifteen years before an individual is hired by a hedge fund and in the following thirty years. The job level is meant to capture different degrees of decision making-power and takes values from 1 (bottom of the hierarchy) to 6 (CEO). Salary is the average annual salary associated in 2016 to each SOC code in six sectors: (i) asset management; (ii) commercial banking and other lending institutions; (iii) financial conglomerates; (iv) insurance; (v) other financial companies; and (vi) non-finance companies.

Figure 6: Histogram of hedge fund liquidations



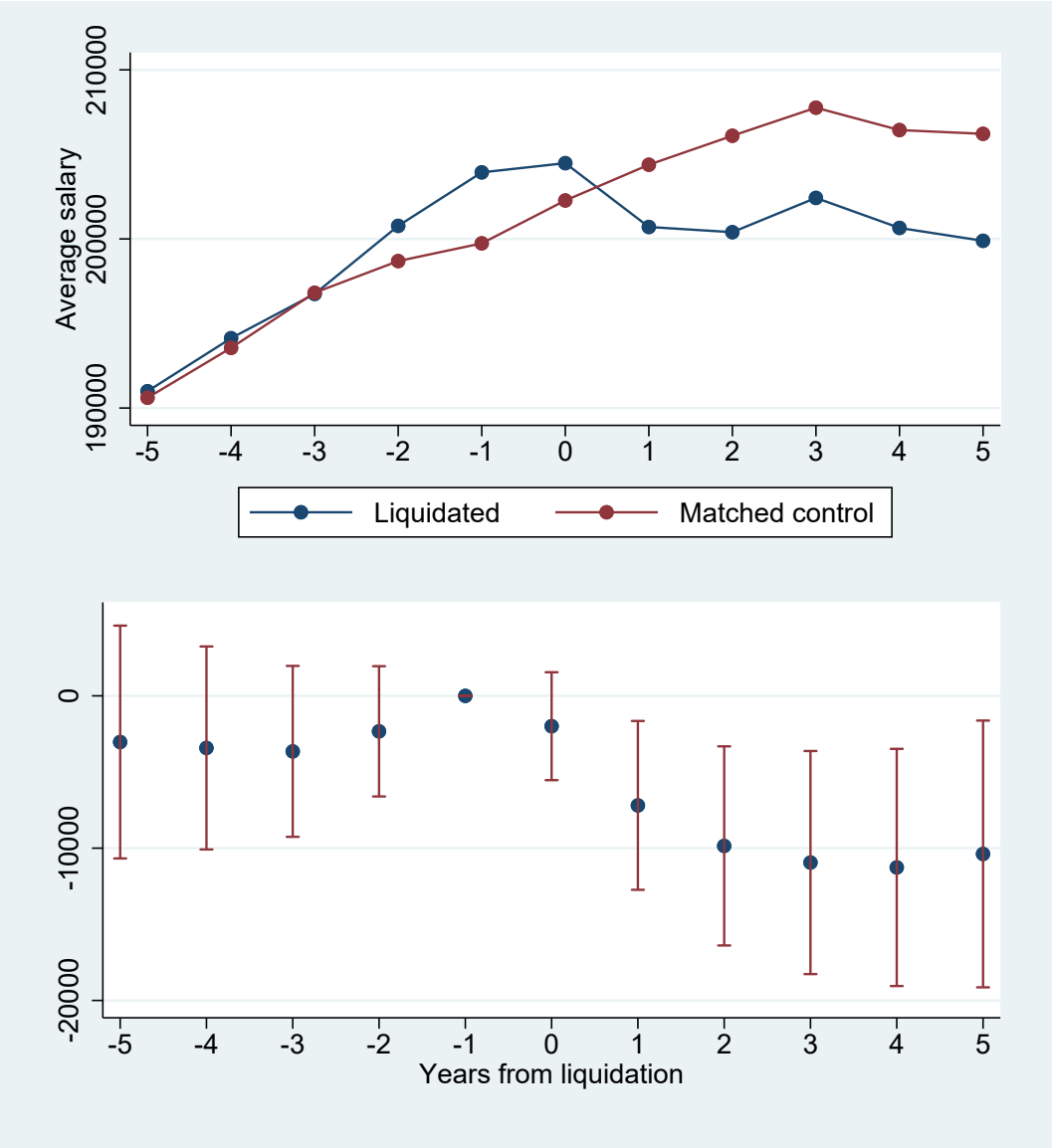
Note. The figure plots the histogram of the years in which individuals experience for the first time the liquidation of a hedge fund for which they work.

Figure 7: Career effect of liquidations



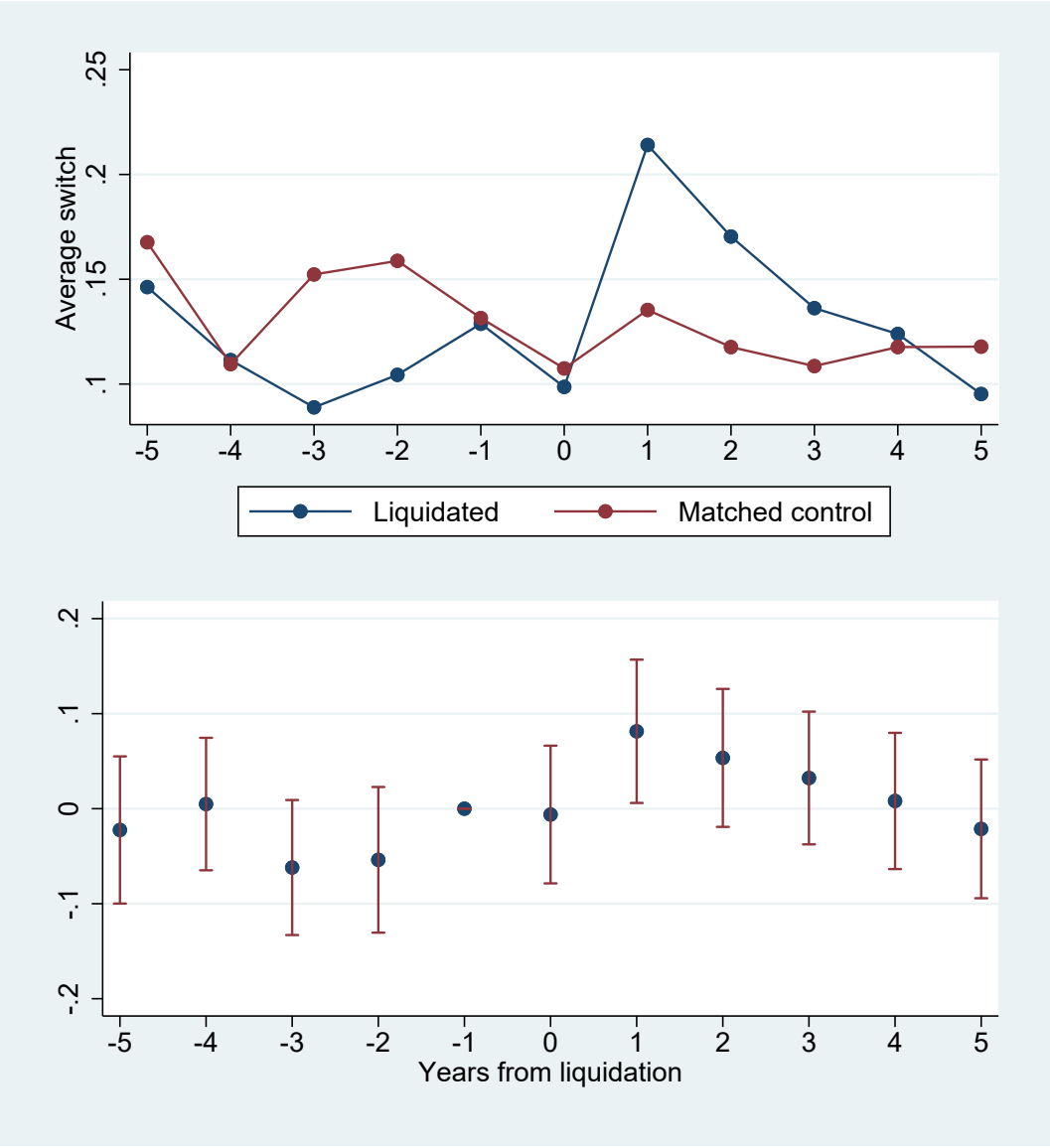
Note. The top panel of the figure shows the average job level in the five years before and after a hedge fund liquidation for employees of liquidated funds and for the matched control sample. Job Level is meant to capture different degrees of decision making-power and takes values from 1 (bottom of the hierarchy) to 6 (CEO). The bottom panel of the figure shows the sequence of estimated θ_k coefficients from equation (2) when the outcomes variable is the job level, i.e. the coefficients of the interaction terms between ever experiencing a liquidation and indicators for time from liquidation in a model that includes time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 8: Salary effect of liquidations



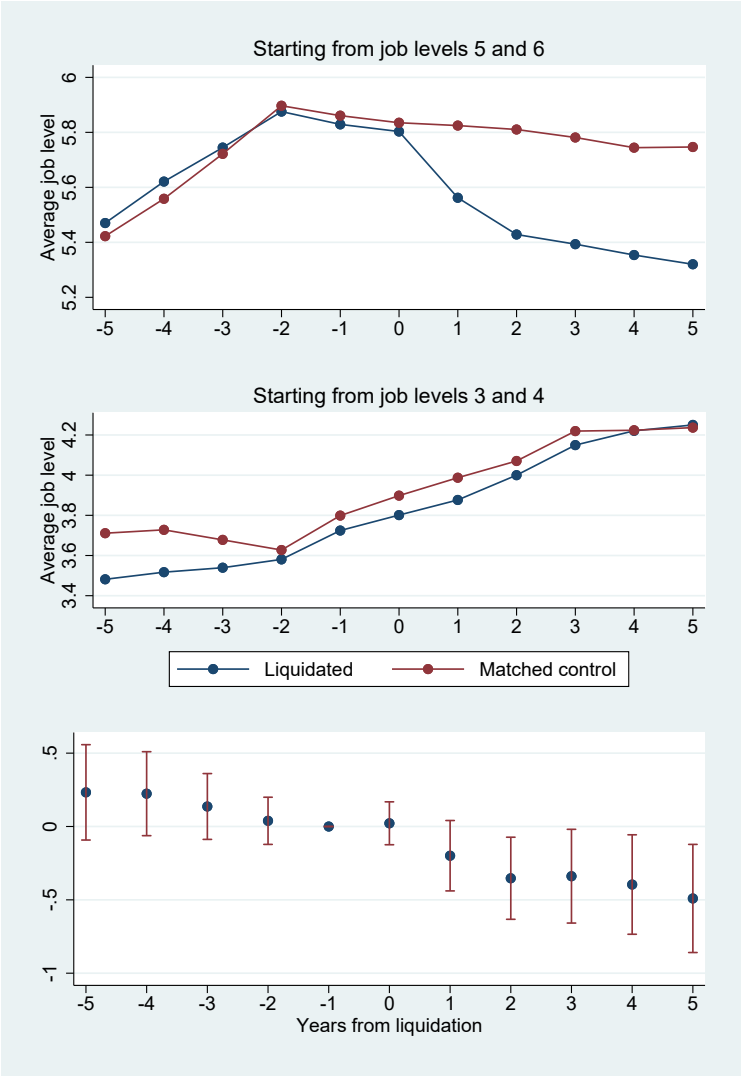
Note. The top panel of the figure shows the average salary in the five years before and after a hedge fund liquidation for employees of liquidated funds and for the matched control sample. Salary is the average annual salary associated in 2016 to the SOC code associated with each employee's position in the relevant sector. The bottom panel of the figure shows the sequence of estimated θ_k coefficients from equation (2) when the outcome variable is the salary, i.e. the coefficients of the interaction terms between ever experiencing a liquidation and indicators for time from liquidation in a model that includes time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 9: Mobility effect of liquidations



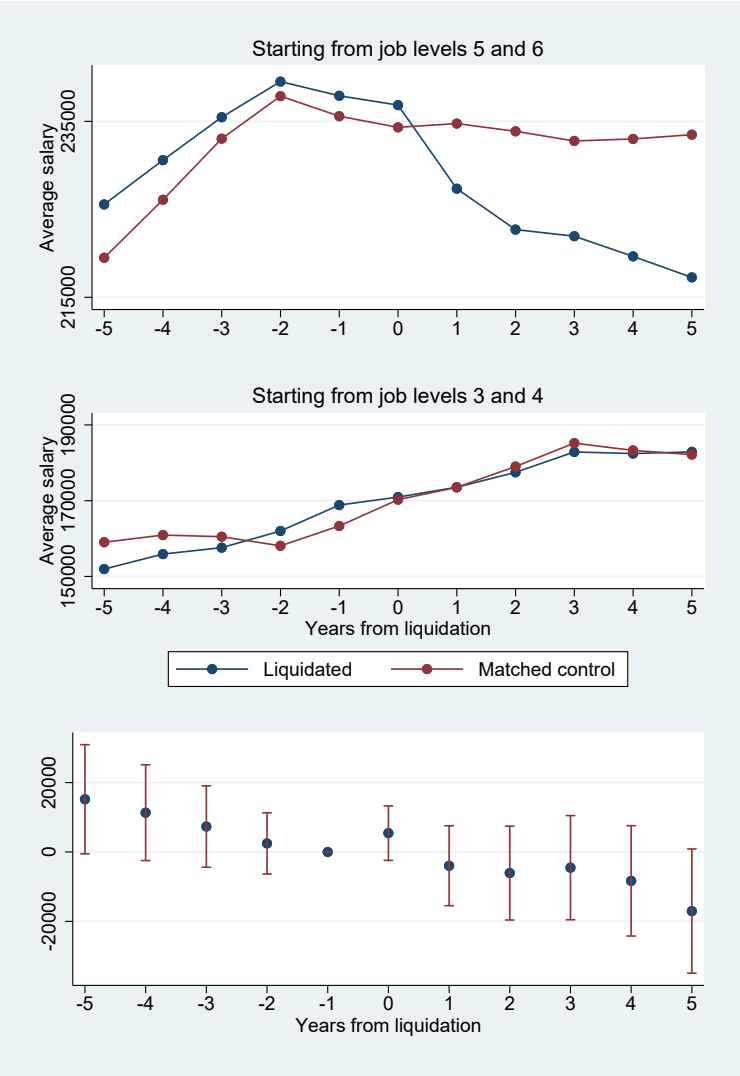
Note. The top panel of the figure shows the fraction of individuals switching to a new company in the five years before and after a hedge fund liquidation for employees of liquidated funds and for the matched control sample. Switch equals 1 if the employee switches to a new employer in the relevant year, and zero otherwise. The bottom panel of the figure shows the sequence of estimated θ_k coefficients from equation (2) when the outcome variable is the switch, i.e. the coefficients of the interaction terms between ever experiencing a liquidation and indicators for time from liquidation in a model that includes time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 10: Career effect of liquidation by job level



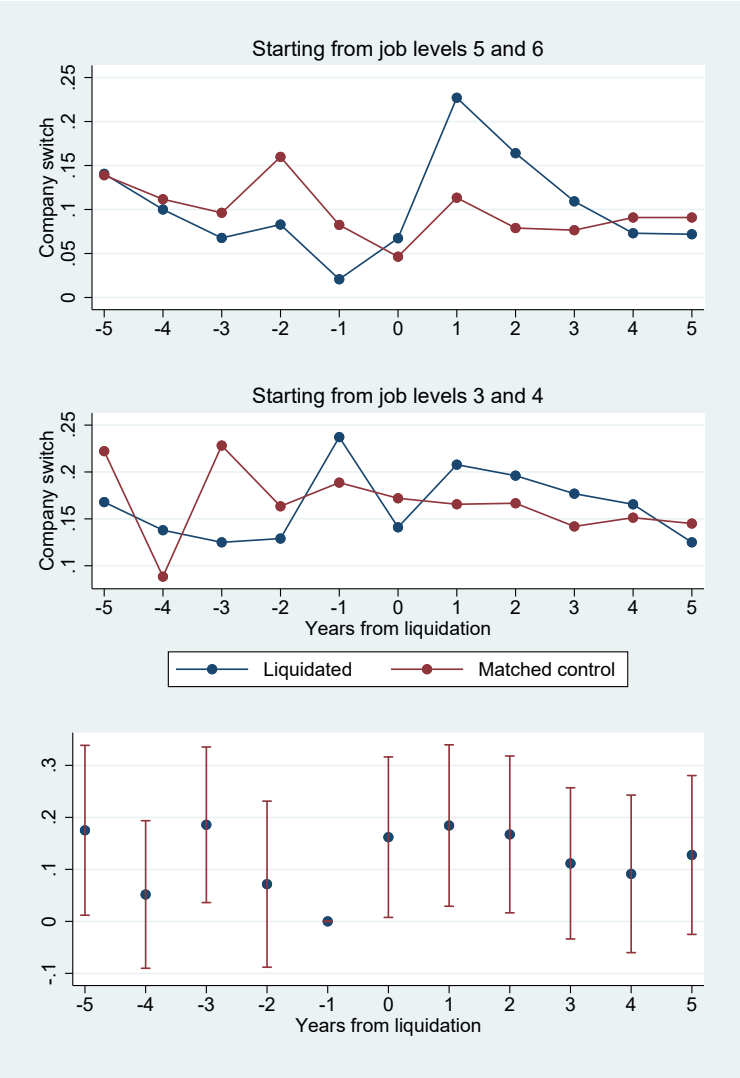
Note. The top panel of the figure shows the average job level in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a top position (i.e. job level 5 or 6) two years prior to liquidation. The mid panel of the figure shows the average job level in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a middle position (i.e. job level 3 or 4) two years prior to liquidation. The bottom panel of the figure shows the sequence of estimated coefficients of the triple interaction terms between ever experiencing a liquidation, holding a top position two years prior to liquidation and indicators for time from liquidation, in a model that includes group-specific time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 11: Salary effect of liquidation by job level



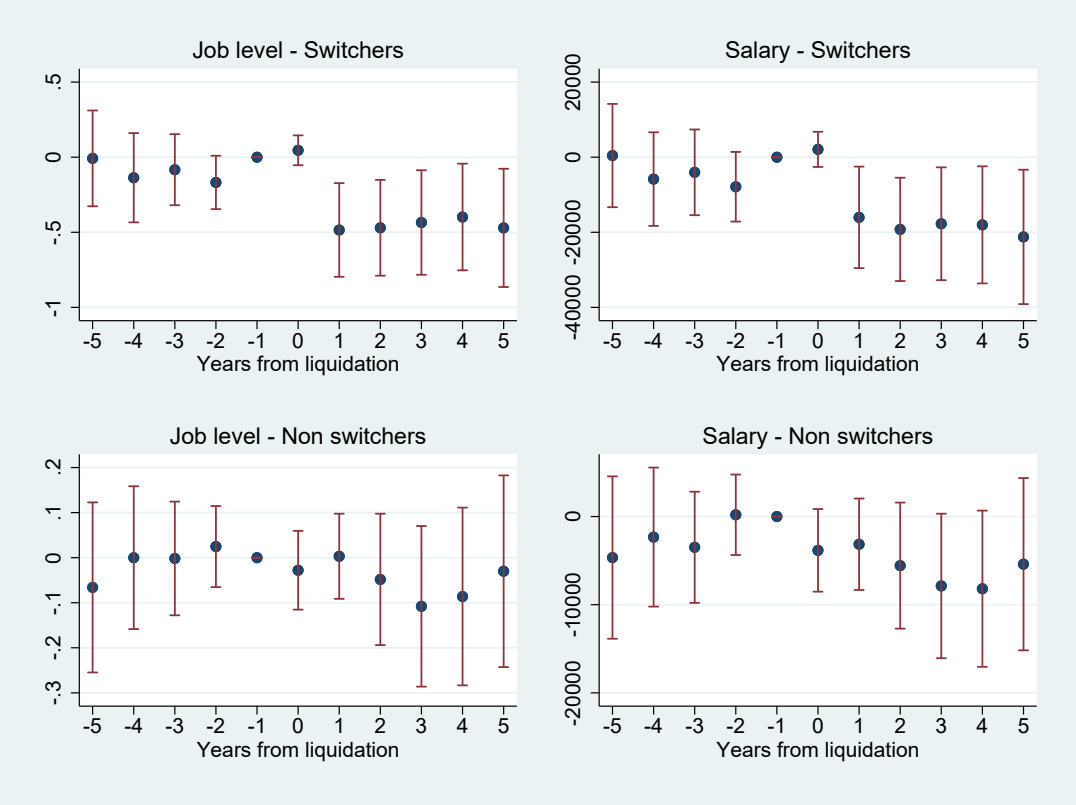
Note. The top panel of the figure shows the average salary in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a top position (i.e. job level 5 or 6) two years prior to liquidation. The mid panel of the figure shows the average salary in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a middle position (i.e. job level 3 or 4) two years prior to liquidation. The bottom panel of the figure shows the sequence of estimated coefficients of the triple interaction terms between ever experiencing a liquidation, holding a top position two years prior to liquidation and indicators for time from liquidation, in a model that includes group-specific time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 12: Mobility effect of liquidation by job level



Note. The top panel of the figure shows the fraction of individuals moving to another company in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a top position (i.e. job level 5 or 6) two years prior to liquidation. The mid panel of the figure shows the fraction of individuals moving to another company in the five years before and after a hedge fund liquidation for employees of liquidated funds and for matched control individuals that held a middle position (i.e. job level 3 or 4) two years prior to liquidation. The bottom panel of the figure shows the sequence of estimated coefficients of the triple interaction terms between ever experiencing a liquidation, holding a top position two years prior to liquidation and indicators for time from liquidation, in a model that includes group-specific time-from-liquidation and individual fixed effects, and the corresponding 95% confidence intervals.

Figure 13: Career effect of liquidation: "switchers" vs. "non-switchers"



Note. The figure shows the estimated job level and salary in the five years before and after a hedge fund liquidation for employees of liquidated funds, separately for employees who switch company in the year after the liquidation ("switchers") and those who do not ("non-switchers"), with the corresponding 95% confidence bounds. The top two panels refer to the first group, and the bottom two panels to the second group.