Do the Initial Job Market Conditions Really Matter for CEO Pay?

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This version: October 2013

Abstract

This paper complements the literature on CEO compensation by studying the effects of job market conditions at the start of future CEOs' careers. We also contribute to research on cohort effects in compensation by taking a closer look at the niche job market for executives. Evidence from other labor market research points to procyclical cohort effects, positing that favorable initial conditions positively affect careers in the long run. We find, however, no evidence of persistent rewards for US public firms' CEOs for starting their career in more successful firms, or for the luck of entering the job market in a good economy. In a setting with future public-firm CEOs and taking account of macroeconomic conditions at the start of their careers, our findings rather suggest that long-term effects are countercyclical: those individuals who start their careers in a recession, earn a higher CEO pay. We also find that initial job conditions may yield a higher first CEO compensation but the positive effect dissipates over time. The findings support the notion that the market for CEOs is efficient.

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1 Introduction

In efficient labor markets, fair compensation is a relevant consideration. Efficiency in the CEO labor market then means that CEO pay is determined by the CEO's ability, talent, exerted effort and her marginal contribution to the value of the company. Efficient labor markets should recognize the difference between skill and luck, and should not punish for adverse circumstances beyond an individual's control. Recent research studying different niches of the labor market, however, finds that initial job conditions such as the phase of the business cycle (exogenous shocks) may determine the long-term success of a career (Oyer, 2006, 2008; Kahn, 2010; Kwon et al., 2010). Should individuals be concerned about carrying a bad signal (stigma) due to exogenous shocks to the economy at their career start? We find that the answer may depend on the niche of the labor market.

Despite being seen as an increasingly competitive market (e.g., Murphy, 2012), the executive job market has not been found immune to shortcomings when it comes to rewarding CEOs. For example, CEOs may be rewarded or penalized for exogenous firm performance shocks beyond their control. As for the upside outcomes, weak governance structures create room for rent extraction by CEOs (Bertrand and Mullainathan, 2001; Garvey and Milbourn, 2006), for the downside outcomes, there may be instances of "unfair" CEO dismissal (Jenter and Kanaan, 2012). We examine the existence and persistence of cohort effects in compensation for individuals who at some point in their career become CEOs. We ask whether current CEO compensation, which may be seen as a measure of current success, depends on initial placement success as measured by first firm size. In particular, is the quality of a future CEO's very first job (better initial placement) reflected in higher current compensation? Our results suggest that it is not the case. After controlling for unobserved firm heterogeneity, successful initial placement does not seem to matter for current CEO compensation. In instrumental variables regressions, the results are not supportive of the

existence of *procyclical* cohort effects for CEOs of US public companies (contrary to the findings in the related literature of *procyclical* cohort effects for many other niches of the labor market). This finding is robust to different measures of firm size and regression specifications. We find, however, a stronger promotion effect for luckier managers. Although it is established in the literature that promotions come with large wage increases (e.g., Gibbons and Waldman, 1999), CEOs who get hired from a top-ranked firm, graduated in favourable economic times, or started their first job in a good economy receive on average a higher first compensation than individuals whose career start is marked by recession. This promotion effect seems to dissipate over time.[1] CEOs who start in recessions seem to have as good career prospects and be as well rewarded as their boom counterparts. Furthermore, results from instrumental variables estimation suggest, at odds with findings of procyclical effects from other cohort effects research, that "recession CEOs" receive *higher* CEO pay than CEOs who entered the job market in good economic times. Robustness results confirm this finding of countercyclical cohort effects in CEO compensation, suggesting the possibility that individuals who succeed to enter the job market in adverse economic times represent on average more talented future CEOs.

We proxy for firm quality with firm size and associate larger firms with higher productivity and better organizational practices. Whether it is becoming a CEO of a larger firm or just starting a career in a larger firm, we consider working at larger firms a proxy for a more successful career start. Starting out at larger, busier firms, firms with more developed internal labor markets offers more opportunities for learning and human capital accumulation (the opportunity to work on many different projects) and promotion (Gibbons and Waldman, 2006). Research shows that better managers tend to work for larger firms and CEOs in larger firms earn more: in highly competitive markets for managerial talent, even a relatively small difference in managerial talent can bring significant benefits to larger firms (Rosen,

[1]Compared to previous studies that are observationally constrained to follow individuals often for only up to 10-15 years, we are able to observe careers for a longer time. For about half of the individuals in our full sample, the observational period is more than 20 years.

1982; Gabaix and Landier, 2008; Terviö, 2008). Market capitalization - the market value of equity - is our primary firm size measure since it also reflects the markets' evaluation of the firm's future prospects.[2]

We instrument the quality of the first job by using several indicators of the overall economic situation at the time the future CEO took up the first job assignment of her career. Exogenous shocks influence the likelihood of who enters the "CEO talent pipeline", thus having access to more developed internal labor markets and more career opportunities.[3] We establish that, conditional on the controls included in the regression, the economic conditions at the time of the first job have no effect on CEO pay other than the effect through first job quality. Thus, we exploit the variation in the indicators for the overall economic situation as a source of exogenous variation in first job quality, and investigate a causal link going from first job quality to current job quality. In other words, if we can accept that the overall econonomic conditions at an individual's career start are not related to the individual's current compensation, and they only influence the individual's success when entering the job market, we create a setting closer to a randomized trial (i.e., data that capture randomizing individuals to cohorts and measure their compensation - as CEOs or not - decades later).

Instrumental variables estimation to some extent alleviates concerns of endogeneity but there are at least two layers of selection in the data.[4] The initial job market conditions are not the same for all individuals and they do not determine whether an individual becomes a

[2]Gabaix and Landier (2008) argue in favour of using full market capitalization (total value of debt plus equity) to predict CEO compensation from the point of view of their model (under the supposition that the contribution of managerial talent to the firm's future earnings is permanent, as opposed to temporary) but also based on empirical data analysis. Given that the market value of equity is the main source of variation in firms' market values, our choice of market capitalization of equity for the proxy for firm size and success is a highly substitutable alternative.

[3]Despite changes to the traditional executive career paths (e.g., Khurana, 2002; Cappelli and Hamori, 2004), becoming a suitable CEO candidate often requires a long-term learning process about internal complexities of organizations and industries. "CEOs are invested heavily in the companies that employ them and firms likewise in the executives that lead them. Sorting takes place early in careers when the information about ability and talent is difficult to come by."(Elson and Ferrere, 2013, p. 121)

[4]A possible solution to this concern would be a double-selection model, based on Heckman's selection model (Heckman, 1979) that uses a two-stage procedure and the inverse Mills' ratio. However, in-sample selection issues often make the identification and the validity of such a model's assumptions debatable.

CEO or not. All individuals in our dataset make it to the "present" (1992-2007) as CEOs, so this achievement is "guaranteed" to happen in the data. Thus we cannot really study cohort effects on a full scale of success in careers by involving and comparing to individuals who never climb the job ladder to a CEO position. We can only see if the individuals have a more or less successful CEO career. Also, we are not able to follow all future public-firm CEOs for the same amount of time. The first job is any first assignment in the individual's career *for which we have firm-related data*, so here again we are constrained to public firms. CEOs fall out of our observational data, fired, retired, moving to a non-public firm or to a non-CEO job, or due to other (e.g., personal) reasons but only after they become CEOs. The possibility that endogenous choices of individuals drive the results requires a careful selection of controls when performing pooled OLS, least square dummy variable or fixed effects estimation, and credible choices when it comes to instruments for instrumental variables estimation. The instrumental variables should influence the dependent variable of interest only indirectly (valid instruments) while being highly correlated with our endogenous variables (strong instruments).

As robustness checks, we perform cross-sectional regressions to check for the stability of coefficient estimates, instrumental variables regressions with an alternative set of instruments, and weak-instrument-robust instrumental variables regressions based on conditional likelihood ratio confidence intervals. The findings from the robustness analysis suggest countercyclical cohort effects in CEO compensation.

Several recent papers study cohort effects (in pay, in job rankings, in promotions) in labor markets for college graduates, PhD economists, investment bankers, executives, blue- or white-collar workers. Oyer (2006) provides evidence on career stickiness for economist with a PhD degree. Academics who enter the job market in a recession tend to work for lower-ranked institutions years later, have lower research output, and are offered less tenure-tracked positions. Oyer (2008) finds that MBA investment bankers who start careers on Wall

Street during bullish stock markets are more likely to keep their prestigious position in the long term, and their earnings are substantially higher than those of MBA graduates whose prospects were diminished by adverse stock market shocks. Kahn's (2010) results show that white male US college graduates who graduate in downturns are at a disadvantage which translates into significantly lower wages in the medium to long term (as much as two decades into their careers), and worse career prospects. According to Kwon et al. (2010), the employment growth rate, rather than the unemployment rate which is widely used in cohort effects studies, becomes more relevant in determining long-term job attainment. Workers entering the job market in a recovery phase of a business cycle earn more and get promoted faster than those who enter during the peak.

In terms of the niche labor market they study, Schoar and Zuo (2012) is the paper closest to ours. Their results suggest, again, long-term cohort effects present in the executive (CEO) job market. "Recession CEOs", i.e. CEOs who started their careers in a recession year, work on average for smaller companies, and switch less between companies or industries. They are promoted faster to become CEOs but their first CEO compensation is lower in comparison to "non-recession CEOs". Their management styles tend to be more conservative: they hold less debt, invest less, tend to diversify across segments, and their firms have lower stock return volatility. While our focus is on the long-term consequences of first job quality for CEO pay, Schoar and Zuo (2012) study the implications of being a "recession CEO" for the CEO's career path, *first* CEO compensation, and for the strategic decision-making in firms with these CEOs. The setup for capturing the link from "then" (at the start of the individual's career) to "now" (the developments in the individual's CEO career) is different. We instrument the first job quality measure by a wider array of measures for initial job market conditions, and consider implications for CEO pay only. Schoar and Zuo (2012) study a variety of response variables but use a single indicator variable, instrumented by the individual's age, for conditions at the start of the individual's career.

The findings from the research on cohort effects are puzzling in that they all point towards an unexplained persistent effect of the start-of-career macroeconomic conditions on individuals' careers. Those who begin in booms seem to get more options for career development, reflected also in their higher earnings (procyclical effects).[5] But the persistence story may have many layers. Even if the workings of a suitable underlying model are yet to be attributed and tested, partial potential explanations are of importance at this point.

According to Kahn (2010), the relative importance of human capital disparities at the career start, and the ease with which they can be overcome determines how persistent initial effects are. Arguments concerning persistence versus non-persistence of first job effects can also be boiled down to a "born or made" (Oyer, 2008), "nature (selection) or nurture (imprinting)" (Schoar and Zuo, 2012), "skills or luck" (Oyer, 2006) discussion. As Oyer (2008) puts it, if starting to work on Wall Street, an opportunity that is more easily attainable in booms, *causes* one to work there later on, then investment bankers are "made" rather than "born" to work on Wall Street. In the context of CEO careers and the business cycle, due to early career experience, managers may acquire a certain set of skills (different for recession and non-recession managers) and the given cohort of managers becomes more apt to manage firms either during recessions or during booms. Schoar and Zuo (2012) name it the "imprinting effect". They distinguish this effect from the "selection effect", when there are managers with different sets of skills in each cohort, some better at managing firms during recessions, some during booms. Firms and managers (CEOs) then match and re-match according to their needs and abilities along the business cycle.[6]

In a deeper look at the theories that provide possible explanations for why initial place-

[5]Certainly, individuals realizing this may time their job market entry to favourable economic times. This endogeneity issue should be kept in mind when performing empirical tests.

[6]If the latter effect is at work in the executive labor market, we will probably not find evidence on persistent influence of initial market conditions. Also, if managers are formed - lastingly "imprinted" - early on in their careers, then if a recession hits in the middle of their careers (for example, at the time they take up their first CEO assignment), it will not have long-run consequences for them. In additional, here unreported work, we perform tests on the persistence of *first CEO job* effects and find no statistically significant results.

ment may have long-term effects on one's career, Kwon et al. (2010) distinguish between productivity-based and non-productivity-based theories of cohort effects. *Productivity-based theories* suggest that starting a career in a good economy, with a better first job, allows to learn more and develop higher-than-average productivity, and be rewarded by higher-than-average pay in the long run. Firm-specific human capital, or rather task-specific human capital (Gibbons and Waldman, 2004; 2006) developed through more advanced on-the-job training in better quality institutions may make it more advantageous for an individual to continue working for the same (type of) better-quality firm. Initial match quality, however, can generate procyclical or countercyclical cohort effects. In the procyclical view, more jobs available during booms allow workers to find better matches. An argument for countercyclical cohort effects is that during recessions, when there are less jobs available, firms are at an advantage. The selection process is more careful, firms find better matches (more productive employees) for the positions they offer and reward them with higher pay. *Non-productivity-based theories* suggest that downward rigidity in jobs, long-term contracts, or signalling may cause procyclical cohort effects without the existence of productivity disparities between cohorts. Employees hired during recessions may be more willing to sign long-term contracts with lower long-term wages (consistent with findings of Beaudry and DiNardo, 1991). Also, the job market may fail to account for the role of luck in the first placement and the first job may be considered a strong signal of the individual's ability (Waldman, 1984) even though it could represent a systematic non-rational behaviour of markets (Oyer, 2006).

The remainder of the paper is organized as follows. Section 2 describes the data and Section 3 explains our empirical methodology choices. The results and their interpretation as well as a robustness analysis are presented in Section 4. Section 5 concludes.

2 Data

Data-wise we are limited to examining public firms only.[7] Data availability due to reporting requirements and more transparency demanded by regulators from these firms gives us a kind of an "efficiency" advantage. CEOs of these firms find themselves under more public scrutiny and under the spotlight of financial markets. We are interested in whether this scrutiny can ensure that it is the CEOs' managerial ability rather than lucky circumstances that shape their career path.

The data for our panel with 13,378 firm-year observations come from several sources.[8] Data on firm financials come from Compustat North America Industrial Annual, and for financial markets related data from CRSP. Data on CEOs' profile come from BoardEx and are complemented with compensation data from Execucomp. Further, we gather data from the Federal Reserve (interest rates), National Bureau for Economic Research (recession indicators) and U.S. Bureau for Labor Statistics (unemployment) to build our instrumental variables. The dataset follows 1,473 publicly listed companies from the S&P 1500 universe and their 2,184 CEOs throughout 16 years, from 1992 to 2007.

We apply two conditions to the full sample: the CEO has to be present in the firm for at least 3 years (Bertrand and Schoar's (2003) condition for a CEO to leave an imprint on the company), and we take into account only non-financial firms, i.e. observations for firms with two-digit SIC codes from 60 to 69 are dropped. Less than 1% (0.87%) of CEOs in our sample appear as CEOs in another firm of the sample.[9]

[7] With data from BoardEx, we can in many cases reconstruct individuals' entire careers, including positions in private firms. However, the main measures of success we use (firm size and CEO compensation) are not available for private firms in our data sources.

[8] We perform tests with a full sample and several subsamples. Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

[9] As we discuss in more detail below, because of the small percentage of within-sample movers, accounting for firm fixed effects almost coincides with employing managerial fixed effects.

The summary statistics for the full sample and the pairwise correlations for the potential right-hand-side variables are presented in Table 1 and in Table OA1 in Online Appendix 1, respectively. The variables computed in a ratio form or variables more prone to measurement error are winsorized to mitigate the influence of outliers. We apply winsorization below the 1st percentile and above the 99th percentile.

First firm size refers to the size of the firm at the time of our individuals' first job assignment for which data is available on her employer - a public company. For a more complete characterization of our future CEOs' first employment, there are four measures of "first firm size" that appear in the statistical description of the data in Table 1: *First Market Capitalization*, *First Total Assets*, *First Sales* and *First Number of Employees*.[10] We report regression results with only two of them, *First Market Capitalization* and *First Total Assets*. Since we focus on the success in publicly listed companies, we consider market capitalization, our market-related measure, the most relevant measure for first firm size and quality. The correlation coefficient between *First Market Capitalization* and our alternative firm size measure, *First Total Assets*, is 0.881.

Given the availability of compensation data in Execucomp, we follow CEOs at S&P 1500 companies. The average firm at the time of our individuals' first assignment as a CEO in a public company has a market capitalization of $2.57 billion (median value $434.5 million), total assets of $2.27 billion (median value $368.6 million), annual sales of $30.5 million (median value $5.86 million), and employs 2.13 million employees (median 412,220

[10] All four are commonly used in the literature but they are not interchangeable and may produce divergent conclusions in different settings (Smyth et al., 1975; Shalit and Sankar, 1977). Unreported in Table OA1 in Online Appendix 1, the four firm size measures are highly correlated in-sample. The strongest correlation arises between *First Total Assets* and *First Sales* (0.936), and the weakest between *First Market Capitalization* and *First Number of Employees* (0.742). Sales is a measure less susceptible to accounting manipulation than total assets but there are less observations available - the first year of data availability for the variable "SALE" in Compustat is 1975. Another non-accounting measure, number of employees, has a "long intellectual tradition" (Rajan et al., 2001). Because of the connection to the stock market, however, market capitalization seems the most relevant measure for our public firms' sizes. Moreover conclusions from regressions with *First Sales* or *First Number of Employees* are qualitatively very close to those with *First Total Assets* and we do not report these results.

employees).

As controls at the firm-level, we include those that appear in the compensation regressions of Graham et al. (2012): lagged market capitalization *or* lagged total assets, lagged market to book, stock return and lagged stock return, return on assets and lagged return on assets, and stock return volatility.[11] The pairwise correlations between firm-level controls are rather low, with the exception of variables and their lagged versions and the alternative firm size measures. The correlation coefficients between current firm size and first firm size measures are moderate (between 0.33 - 0.425) which may be caused by persistence in firm size dynamics - the minimum time difference between "current" and "first" in the full sample is one year. We address this issue through subsamples, by applying the condition that this difference is at least 10 years.

We use two measures for CEO compensation. Execucomp's TDC1, a proxy for grant-date compensation, comprises of several components in a CEO compensation package: Salary, Bonus, Other Annual, Total Value of Restricted Stock Granted, Total Value of Stock Options Granted (using the Black and Scholes option valuation model), Long-Term Incentive Payouts, and All Other Total. TDC2, a proxy for realized compensation, adds the Net Value of Stock Options Exercised to the former list of components. The average annual CEO compensation in our sample is \$3.894 million (TDC1 in 2005-constant dollars; includes the value of granted stock options) and \$3.975 million when the net value of exercised option is accounted for (TDC2 in 2005-constant dollars). The median compensation values are \$2.085 million and \$1.598 million (in 2005-constant dollars), respectively.[12] The average CEO in our sample

[11] More detail on these variables can be found in Table A2 in Appendix 2.

[12] Due to significant changes to executive compensation reporting requirements under the U.S. Securities and Exchange Commission regulation, there is a change in the definition of a number of compensation variables in Execucomp after 2006. A number of compensation variables require adjustments for at least approximate comparability between the 1992-2005 and 2006-present periods. As suggested and described in, e.g., Walker (2009) and Maug et al. (2013), for instance the post-2006 TDC1 variable can be considered approximately equal to the pre-2006 TDC1 *minus* the value of long term incentive plans (variable LTIP in Execucomp, which includes the ex-post value of performance shares from TDC1) *plus* the ex-ante value of performance shares computed as the product of the target number of performance shares granted to the

has a CEO tenure of 106 months (8.83 years) and gets her first CEO job in a publicly listed company at the age of 52.5 years.[13] The individuals in our sample graduate on average at the age of 23.3 years, they start their career (as far as it can be traced back in our data, not necessarily the first firm if it is a private firm) at the average age of 29.6 years.[14] The average career start in a public company (observations for which we have firm data) happens at the age of 36.4 years.

Approximately 60% (56.27%) of future CEOs become CEOs in the same public company where they start their career and around 40% of the CEOs are hired from outside the firm. 5.74% of individuals start in a top-ten company. More than 65% of these CEOs are also the chairman of the board of directors in addition to their CEO assignment. Around a third of our CEO-to-be's have an MBA degree. Only about 1.5% of the individuals in our sample are women. From among the CEO-level controls, CEO tenure and the CEO & Chairman indicator have the highest correlation (0.323), suggesting that more experienced CEOs tend to be more powerful.[15] The other pairwise correlations within this group of variables are close to zero. The CEO-level and firm-level controls are also weakly correlated.

We employ six instrumental variables: (1) The recession indicator equals one if NBER identified the period at which the future CEO entered the first employer company as contraction or through. 15.78% of individuals in our sample start their career in a recession or through (11.78% when considering only public firms for which we have data). 14.07% of individuals graduate at the time of a contraction or through. In some instances, for purposes of comparison, we employ Schoar and Zuo's (2012) recession-year indicator which identifies

CEO (variable SHRTARG in Execucomp) and end-year stock price. The 2007 compensation data account for a small percentage of our observations (approximately 6%). The results are virtually unaffected when we consider adjustments to compensation data after 2006, hence we report only our baseline results without any pre-2006 or post-2006 adjustments to the compensation variables.

[13]This relatively young age for first-time CEOs in public firms is consistent with the findings of Schoar and Zuo (2012) that CEOs born in later decades start their CEO jobs at younger and younger ages. Most CEOs in our dataset were born in the 1950s and 1960s.

[14]We can address the concern of data non-availability for private firms by using macro conditions in the graduation year or at the date of the first position ("reduced-form" regressions).

[15]On the importance of controlling for CEO power, see, for example, Adams et al. (2005).

years of mild economic expansion or recession, i.e. years that do not contain the peak of a business cycle, at career start. The correlation between the two NBER business cycle classification based indicators is low (0.0454). The limitation of these indicators is that they are based on NBER's ex-post business cycle classification and may not reflect market participant's expectations concerning the business cycle at the given historical moment; (2) The average U.S. unemployment rate for the preceding year is another macroeconomic instrument. The unemployment rate is a coincident, countercyclical indicator; (3) The investment-grade bond yield spread is the difference between interest rates on highest quality bonds (Standard & Poor's Aaa) and lowest quality bonds (Standard & Poor's Baa) in the category of investment-grade bonds. In times of economic strain, this spread is wider. Conditional on financial markets' ability to reflect market participants' expectations of the future (i.e. conditional on financial markets being efficient to some extent), financial indicators such as the evolution of the S&P 500 composite index or bond yield spreads are useful indicators, readily available at any phase of the business cycle; (4) The one-year change in the S&P 500 index volume, (5) the one-year return on the S&P 500, and (6) the standard deviation of returns on this index of the 500 biggest publicly traded companies are three financial-markets-related instruments as in Oyer (2008), with which we complement the NBER-classification-based and macro indicators.

The instruments are weakly or only moderately correlated with firm-level and CEO-level controls and exhibit somewhat stronger correlations among themselves. The strongest positive within-sample correlation arises between the investment-grade bond yield spread and the unemployment rate (0.562) and the strongest negative correlation between the recession indicator and the S&P 500 return (-0.587) (see Table OA1 in Online Appendix 1).

Figures 1 and 2 show the evolution of firm size throughout CEOs' careers. We depict the average market capitalization (y-axis) at the time of the job market entry (x-axis) and, on each other separate plot, the average firm sizes 10, 20 and 30 years after the job market

entry. In Figure 1, we plot the in-sample average market capitalizations for all firms for which we have data in a given year 10 years, 20 years or 30 years after the initial year. To capture the macroeconomic conditions at the time of the market entry, we also include a dotted line: it shows the annual S&P 500 index return during the career-start years. Up to the mid-1970s and from the mid-1980s on, we can observe procyclicality demonstrating itself as the very similar shapes of the plots of the S&P 500 return and the average market capitalization at the start of career. In Figure 2, we plot the average market capitalizations only for firms where the initial CEOs work for 10 years, 20 years or 30 years. We focus on the same cohort of future CEOs through time. The attrition is, naturally, more pronounced in this graph (as shown by the changes in the numbers of observations below the line chart).

If our hypothesis on the persistence of conditions at the first job holds true, we would expect very similar shapes for all full lines in the two figures. For example, individuals who started their career at smaller (worse quality/less successful) firms, would also work on average for smaller firms 10, 20 or 30 years later. However, such pattern does not emerge in any of the figures. The lines for average firm sizes take on very diverging shapes; more often than not they exhibit very weak similarity in shape. More frequently in Figure 2 than in Figure 1, they intersect on several instances which means that CEOs who started out at a larger firm may later end up either in a smaller firm, or in a larger firm - there is no pattern identifiable or easily perceptible from the plots. Furthermore, the full lines for average firm size at the start of career correspond to the shape of the dotted lines representing the macro conditions at the start of career only to a very small extent. Although the number of observations for each depicted entry year is fairly equally distributed, we need to keep in mind the selection bias in our data. All the individuals we consider become CEOs at some point. Some of them become CEOs faster than others (on average, they take around 20 years), so the period for which we can follow each of them in their CEO position in our data is also quite different (on average, 7.5 years).

3 Empirical methodology

We base our empirical methodology on Graham et al.'s (2012) executive compensation specification. It is a version of the classic Mincerian earnings function augmented to include fixed effects to address omitted-variable bias. Fixed effects estimation however cannot address all instances when explanatory variables and idiosyncratic errors are correlated. Omitted-variable bias may arise due to unobserved time-varying factors, measurement errors, or simultaneous responses to exogenous shocks.[16] Instrumental variable regressions may address several issues in our panel affected by selection and endogeneity. The small percentage of within-sample movers as well as the smaller statistical power in firm fixed effects when we have a large number of firms relatively to the sample size give us further incentives to engage in instrumental variables estimation.

Our approach in the instrumental variables estimation is similar to that of Oyer (2006; 2008): our start-of-career measure is a proxy for first placement success (*First Firm Size*). We instrument our main explanatory variable with measures for macroeconomic conditions at the start of the individual's career. The regressor of interest in our case is just a "more lagged" version of a firm-level control (the lag varies between 2 and 55 years). Individuals may choose when and in which firm they start their careers but instrumenting should capture the variation in first jobs beyond the individuals' control.[17]

As a point of departure in examining the persistent effect of first job circumstances, we

[16] Under fixed effect estimation here we also include least squares dummy variable estimation.

[17] Schoar and Zuo (2012) have a slightly different approach. With their "recession CEO" indicator variable, they directly control for whether the individual started her career during a recession year. They account for possible self-selection and timing one's job market market entry by instrumenting the "recession CEO" dummy with the individual's year of birth plus 24, the average age at which the individuals in their sample enter the job market. This timing is probably more relevant for individuals with average abilities. As discussed for example in (Oyer, 2006), "superstar" employees are likely to be hired without regard to the phase of the business cycle.

define the following pooled OLS regression:

$$Log(Comp)_{jt} = \alpha + \beta Log(FirstFirmSize)_{i,t-k} + \boldsymbol{X}_{j,t(-1)}\boldsymbol{\gamma} + \boldsymbol{Y}_{i(t)}\boldsymbol{\delta} + \varepsilon_{jt} \quad (1)$$

where j, i, t and k indicate companies, individuals, current years and the time that passed since the job market entry, respectively. $Log(Comp)_{jt}$ is firm j's CEO's log-transformed compensation (TDC1 or TDC2) at time t. $Log(FirstFirmSize)_{i,t-k}$ is the log-transformed size of the firm where the current CEO i started her career.[18] $\boldsymbol{X}_{j,t(-1)}$ represents the vector of firm-level controls. They correspond to the controls used in managerial compensation regressions in Graham et al. (2012). We control for firm size (lagged one period, log-transformed), market-to-book ratio (lagged one period), return on assets (both current and lagged one period), stock return (both current and lagged one period) and stock return volatility (during five years up to and including the current year). $\boldsymbol{Y}_{i(t)}$ represents the vector of CEO-level controls. We include indicators for holding an MBA degree, for being a powerful CEO in terms of chairing the board of directors, and for being a female CEO. In addition, we control for CEO tenure (a log-transformed variable).

The simple pooled OLS regressions are expanded to include year dummies (τ_t, to control for time fixed effects), year dummies and industry dummies, and eventually, as in Eq. (2) below, year and firm fixed effects (ι_j):[19]

$$Log(Comp)_{jt} = \beta Log(FirstFirmSize)_{i,t-k} + \boldsymbol{X}_{j,t(-1)}\boldsymbol{\gamma} + \boldsymbol{Y}_{i(t)}\boldsymbol{\delta}_{i(t)} + \tau_t + \iota_j + \varepsilon_{jt} \quad (2)$$

[18] As for the coefficient estimates of interest, we report regression results with *First Market Capitalization*(main tables of results) and *First Total Assets* (due to similarity with the market capitalization results, reported in the online appendix). Note that for greater consistency, the current (lagged) firm size control variable corresponds to the first firm size variable; with *First Market Capitalization*, we use log-transformed lagged current market capitalization, and with *First Total Assets*, we use log-transformed lagged current total assets.

[19] We identify industries according to the Fama-French 12 industry classification.

In the interpretation of results from the latter, we need to keep in mind that due to a small percentage of within-sample movers (less than 1%), applying firm fixed effects is almost equivalent to including CEO fixed effects. Graham et al. (2012) highlight the importance of including both firm and managerial fixed effect in compensation regressions to avoid misleading coefficient estimates.[20] But they also point out that controlling for unobserved heterogeneity should correspond to the goals of the research. When dealing with variables that vary cross-sectionally or are highly time-persistent, fixed effects may wipe out the variation of interest. Since our main variable of interest, the firm size at the start of a career, is time-invariant and fixed for each individual, CEO fixed effects would pick up this influence and distort the estimation of first firm size effects.

We run the pooled OLS and other specifications for the full sample as well as for two subsamples. Subsample 1 is obtained from the full sample by applying the condition that the time difference between starting the first job in a public firm and becoming a CEO is at least 10 years. The idea is to decrease the influence of possible firm size/performance persistence on current CEO compensation. Subsample 2 is obtained from Subsample 1 by applying the additional condition that the individual is not more than 30 years of age at the start of her career (in a public firm). Thus we intend to examine the effects for observations for which we are probably capturing the very beginning of an individual's career. A drawback of applying the two conditions is a significant decrease in the number of observations. We lose more than half of observations by moving from the full sample to Subsample 2.

Controlling for time-invariant firm heterogeneities in panel data may take us beyond correlation analysis and can be considered suggestive of a causal relationship going from - in our case - first firm size to current CEO compensation. Instrumental variables estimation (in this case, two-step least squares, 2SLS) can be used as another technique to study causal

[20] According to Graham et al.'s (2012) results, manager fixed effects and firm fixed effects contribute significantly to their model's R-squared. The fraction of the model sum of squares corresponding to manager fixed effects and firm fixed effects is 54% and 25%, respectively.

relationships. The success of the technique lies in the choice of instruments. These instruments should be strong, valid and take proper account of possible heterogeneous responses of economic agents (Murray, 2006).[21] Instruments always represent a somewhat arbitrary choice but require a lot of sophistication in order to establish credibility in the results. The consistency of instrumental variables estimation may be defeated by huge inefficiency issues, even to the point that instrumental variables estimation does not offer any advantage over largely biased inconsistent OLS estimates.

We use two sets of instruments, each of which includes three variables. The financial-markets-related set of excluded instruments comprises the one-year S&P 500 volume change, one-year S&P 500 return and two-year S&P 500 standard deviation. The set of macroeconomic-conditions-related instruments includes the recession indicator, the investment-grade bond yield spread and the one-year average US unemployment rate. We also run instrumental variables regressions with a single instrument by including each variable from the previous two instrumental variable sets separately. This helps understand the particular influence and contribution of each of the instrumental variables to the results. "Reduced-form" regressions serve as another robustness check for the relationship between variables that are separated in the two stages of 2SLS. In these regressions, instruments enter in the main equation, replacing the instrumented main variable of interest. "Reduced-form" equations serve as important checks for the instruments' intuition, and if the instruments are valid, these equations are estimated consistently with OLS (Murray, 2006).

All individuals in our sample become CEOs at some point in their career. After the panel data analysis, we turn to cross-sectional regressions by examining the effects of first

[21] We are studying a group of individuals all of whom eventually become CEOs. To the point that this group may be considered less heterogeneous than, for example, a large cohort of workers with different job attainments, we can expect less heterogeneous reactions to the changes in the business cycle. This certainly does not imply that by studying the given group of individuals and their employers we ensure capturing the economically interesting responses.

job conditions on first CEO compensation:

$$Log(FirstComp)_i = \alpha + \beta Log(FirstFirmSize)_i + \boldsymbol{X}_j\boldsymbol{\gamma} + \boldsymbol{Y}_i\boldsymbol{\delta} + \varepsilon_i \tag{3}$$

where $Log(FirstComp)_i$ represents the individual i's first compensation (TDC1 or TDC2) as CEO. As before, $Log(FirstFirmSize)_i$ may stand for *First Market Capitalization* or *First Total Assets*. We then replace $Log(FirstFirmSize)_i$ in Eq. (3) with the $TopTen_i$ indicator, or directly with several variables from among the instruments that characterize the macroeconomic conditions at the time of the individual's first job *or* at the time of her graduation. Note that the cross-sections for when we employ macro variables as main explanatory variables are larger compared to the previous cross-sectional samples since we are not required to have information on the individuals' first employers. Data on macroeconomic conditions at the time of the job market entry are more widely available than company data.

4 Results

In Subsection 4.1, we discuss the results from employing the empirical methodology suggested in Section 3. Some of these tests already serve as robustness checks to the benchmark results. In Subsection 4.2, we offer and discuss further considerations to test the robustness of the main results.

4.1 Main results

Table 2 presents our benchmark results. We run pooled OLS, least squares dummy variable (LSDV) regressions and fixed effects regressions with the full sample and Subsamples

1 and 2. The results from the simplest of the specifications, pooled OLS, suggest a statistically strongly significant association between first firm size and CEO compensation. The effect amounts to 3.57%, 4.11% and 4.39% for a one-standard-deviation change in *First Market Capitalization* for the full sample, Subsample 1 and Subsample 2, respectively. (A one-standard-deviation change in *First Market Capitalization* is 2.58-times the full-sample mean.) Similarly, when total assets are used as the firm size control as in Table OA3 in Online Appendix 3, the estimates on *First Total Assets* suggest a strongly statistically significant effect of approximately 3% for the full sample and Subsample 1, and 4.83% for Subsample 2. After we control for more factors by including year dummies and year and industry dummies, the estimated effects corresponding to a one-standard-deviation change in first firm size slightly decrease but are still between 2 and 3%. The statistical significance of these results is lower; for TDC2, however, we do not obtain significant results.

Firm fixed effects may partially control for causality. In all but one of the fixed effects regressions, the effect of first firm size on CEO compensation is not found to be statistically significant. The coefficient estimates on first firm size become rather small (under 1%), in some cases negative. In Panel C of Table 2, the estimated effect of a one-standard-deviation change in first firm size on TDC2 is large, 10.53%, but statistically significant only at the 10% level. In Table OA3, with total assets as the control for firm size, we find overall less statistically significant results. The absence of statistically significant results in the regressions with firm fixed effects may have two different interpretations: there are indeed no persistent effects in first job conditions on CEO pay, suggesting the executive job market is efficient and does not reward CEOs for good initial conditions. The other possible explanation is the lack of variation in the observations (little within-firm variation, large number of firms for too few observations), and thus lack of support in the data to perform a firm fixed effect regression.

Instrumental variables (IV) regressions are another possibility to explore causal effects

going from first job conditions to CEO compensation. Panel A of Table 3 reports the results from instrumenting *First Market Capitalization* with the set of financial-markets-related instruments. There are no positive and statistically significant results. The estimates suggest a large, in most cases negative effect on CEO pay for both TDC1 and TDC2. Individuals starting their career in smaller firms (in worse economic times) earn on average approximately between 30% to 50% more for a one-standard-deviation change in firm size. The signs of the coefficients for the instruments based on the S&P 500 are as expected, although the positive signs of the strongly statistically significant estimates for the S&P 500 volatility are not straightforward to interpret. Accumulated empirical evidence suggests that causality between financial market volatility and recessions works in both directions (e.g., Hamilton and Lin, 1996; Engle et al., 2008). Higher uncertainty in the financial markets may be reflected in higher volatility of the financial markets and may trigger a recession. Our volatility measure covers the two years *before* the individual's job market entry. The results suggest a strong positive association between *First Market Capitalization* and stock market volatility on average. The possible effect of a recession in that it decreases the average market capitalization may show up later, when stock market volatility is lower, but it could be induced also by this larger volatility.

When employing the set of proxies for macroeconomic conditions as instruments in Panel B of Table 3, there are less statistically significant results. The estimated effects are, again, negative, suggesting that starting out at a company larger by one standard deviation leads to lower CEO compensation (TDC1) by as much as 30%. Although the estimates of the macro instruments in the first stage are not statistically significant at conventional levels, they are of the expected sign. The overidentification tests in both Panel A and B of Table 3 all fail to reject the null and suggest that our instruments are not weak. The endogeneity tests fail to reject the null in a number of cases, thus suggesting that we might be better off using non-IV regressions.

When running the IV tests with each instrument separately (Table 4), all coefficient estimates on *First Market Capitalization* are negative and suggest large negative effects on CEO compensation for a one-standard-deviation increase in first firm size, most of them between 20 and 80%. The results are, however, not statistically significant. Marginally statistically significant results (at the 10% level) arise when we instrument *First Market Capitalization* with S&P 500 standard deviation. For a one-standard-deviation increase in *First Market Capitalization*, CEO compensation decreases by 39% and 47% for TDC1 and TDC2, respectively. The signs of the instruments' coefficients in the first stage are as expected; half of these coefficients are statistically significant at the 5% level.[22] The results from Table 4 provide some support for the hypothesis that, as a consequence of being rewarded for succeeding in a stricter selection process in bad economic times, starting a career in a recession results in higher CEO pay on average.

We rerun regressions from Eq. (1) and its variations with *First Firm Rank* and lagged current firm rank in place of the firm size measures. By using firm rank, we study first job effects after flattening the variation in firm size. To establish the firm rank, we order the firms from largest to smallest in each year and assign them their ordinal numbers. The largest firm receives the highest number which equals the total number of firms in the group. The rank is a number between 0 and 1, computed as *n:N* where *n* stands for the ordinal number of the firm and N is the total number of firms. The biggest firm is ranked 1 and the smallest very close to 0 if the number of firms in the group is large. Thus, in Table 5, we replace *First Market Capitalization* with *First Firm Rank* based on ranking firms in each starting year according to their initial market capitalization. The results with these "smoothed out" data support the conclusions from Table 2. Good conditions at the start of a career may

[22]The regressions in Table 4 (more detailed results are in Table OA4 in Online Appendix 4) also include regressions with Schoar and Zuo's (2012) recession year indicator as one of the instruments (see Table A2 in Appendix 2 for variable definitions). The sign of its coefficient estimate is positive, opposite to that of *our* recession indicator. Additional tests (unreported) using an indicator variable that equals one when our and the Schoar and Zuo indicators differ suggest that this might be the consequence of Schoar and Zuo's (2012) recession year indicator capturing on average mild but still positive economic activity while our recession indicator captures only adverse conditions.

lead to higher CEO compensation but the question remains whether we control for sufficient factors in these regressions. The coefficients are statistically significant at the 1% level for all specifications with TDC1 as the response variable, except for when we control for firm fixed effects. The size of the effects corresponding to a one-standard-deviation increase in the measure of firm size is larger than in Table 2, between 6 and 12% for specifications in Columns (1)-(3) of Table 5. As for TDC2, we obtain strong results only in the simplest, the pooled OLS specification (Column 5). Overall, the effects are slightly stronger for the regressions where we set the upper limit for the age at the start of one's career to 30 years (see Panel C of Table 5).

Another variable to characterize the conditions of first employment in a public company is *Top Ten*. Following Schoar and Zuo (2012), *Top Ten* is an indicator variable that equals one if the individual started her career in one of the following top-ten firms: Arthur Andersen, AT&T, DuPont, Ford, General Electric, General Motors, IBM, McKinsey, Procter & Gamble, and Texas Instruments (Schoar and Zuo, 2012, p. 9). When we characterize start-of-career success as working for a top-ten firm, the findings do not differ much from those in Tables 2 and 5. In Table 6, we report results from LSDV regressions with year and industry dummies, using the full sample and both subsamples. Market capitalization is the measure for firm size. The estimates suggest a long-term positive effect between 12-14.5% of starting a career in a top-ten firm on CEOs' TDC1 compensation. The effects are statistically significant (at the 5% level) for TDC1 in the role of the response variable for the full sample only. The average effect on TDC2 amounts to 5.7-9% but these results are not statistically significant at conventional levels.[23]

To further study the persistence of effects of the start-of-career conditions on CEO compensation, we run "reduced-form" regressions in which macroeconomic variables that serve

[23]Table OA6 in Online Appendix 6 reports the results with total assets as the control for firm size. The results are similar. The coefficients on *Top Ten* are all positive, of comparable magnitude, and significant at the 5% level for TDC1 in both the full sample and Subsample 1.

as instruments in the instrumental variables regressions now appear as the main explanatory variable. This allows us to look at the time closest to our individuals' career start - at the first employment and at graduation.[24] We do not need first firm data here; we use data on macroeconomic conditions that are more widely available. We focus on variables whose influence on CEO pay we hypothesize is indirect, through first firm size. In Table 7, we report results with the specification including year and industry dummies, with the full sample, and with market capitalization as the control for current firm size.[25] The estimates are not statistically significant at conventional levels and their signs largely vary, suggesting no long-term impact of the start-of-career conditions - whether macroeconomic conditions at the start of the first job or at graduation - on CEO pay. Schoar and Zuo's (2012) recession year indicator at graduation is the only exception here. The coefficient estimate on the recession year indicator suggests a rather large negative effect, 9%, on CEO compensation (TDC1) which is strongly statistically significant (at the 1% level). Finding a negative effect supports the hypothesis of procyclical cohort effects in compensation and imprinting effects at the start of future CEOs' career. It might be the case that the recession year indicator is a better characterization of initial conditions, capturing influences that the other variables do not, but persistence in firm size may also be driving the results (the results are from regressions on the full sample).

Even if the results concerning persistent effects of first job conditions on CEO pay remain weak or ambivalent, circumstances at the start of future CEOs' career may influence their first CEO compensation. In Table 8, we present these results. The estimates are statistically significant at the 1% level for all regressions on TDC1 - granted compensation. We run regressions with Subsamples CS and CS1.[26] Working for a larger firm, both in terms

[24]The first employer may be a private firm for which data is not available at all, or at least it is not easily obtainable.

[25]Panel B of Table OA7 in Online Appendix 7 reports the results with total assets as the control for current firm size. The results are similar.

[26]Subsample CS is a cross section obtained by selecting the observations with the very first CEO pay for each CEO. For more details on the subsamples, see Table A1 in Appendix 1.

of market capitalization and total assets, or for a top-ten firm at the beginning of the individuals' career contributes to a larger CEO compensation. Since all individuals in our sample become CEOs in a S&P 1,500 company, we capture the effect of the promotion to a public company CEO position for the first time.[27] A one-standard-deviation increase in firm size is associated with 3-5% higher CEO compensation (we obtain a larger effect on TDC1 than on TDC2). The effect of starting out at a top-ten firm is approximately 26% for TDC1, about 10 times larger than for the one-standard-deviation increase in first firm size. The estimates on the top-ten indicator are not statistically significant at convetional levels for TDC2 as the CEO pay measure. In Table OA8 in Online Appendix 8, we report results from "reduced-form" cross-sectional regressions: as in Table 7, the macroeconomic conditions at the time of the first job and at graduation are employed as main explanatory variables. A number of estimates is now strongly statistically significant. For TDC1, the effects of conditions at graduation are moderately higher than at the start of the first job. A one-standard-deviation increase in unemployment rate (1.5%) represents a 3.7% increase in first CEO pay (TDC1) if at the start of the first job and 5% if at graduation. The respective effects for a one-standard-deviation increase in the bond-yield spread (0.5%) are 5% and 6% for TDC1, and 4.7% and 6% for TDC2. The direction of estimated effects supports the hypothesis of granting larger compensations for CEOs hired in turbulent economic times. Thus, to be hired in a recession may mean passing a stricter, more careful selection process, a sign of better skills and qualities which are rewarded correspondingly.

In Table 9, we replicate selected regressions from Table IV and Panel B of Table V in Schoar and Zuo (2012) using our data so as to perform further testing of the first job effects on the first CEO compensation. These regressions examine the effects of the first job

[27]Graham et al. (2012) discuss the promotion versus the person-specific effects in the context of their empirical model with manager fixed effects.

conditions on the first CEO compensation under a different (simpler) specification:

$$Log(FirstComp)_i = \alpha + \beta RecessionYear_i + \tau_d + \iota_s + \varepsilon_i \tag{4}$$

where $Log(FirstComp)_i$ is the first CEO compensation (TDC1 or TDC2, log-transformed) of individual i and $RecessionYear_i$ is the recession year indicator for the year when individual i started her career. Schoar and Zuo (2012) control for decade and industry fixed effects where d denotes the decade in which the CEO was born and s is the industry in which the individual started her career.[28] The alternative specifications replace *Recession Year* with the *Top Ten* indicator and/or add firm-level controls (*Total Assets*, *Return on Assets* and *Sales*). Except for the specification in Column (6) of *our* Table 9, the signs of the estimates on the recession year indicator as the main explanatory variable are negative. This suggests that individuals who start their careers in a "recession year" receive lower first CEO compensation, but the estimates are not statistically significant at conventional levels. According to the Schoar and Zuo regression specifications where the top-ten indicator is the main explanatory variable, all but the estimate in Column (8) are statistically significant at the 1% level. The positive effects on the first CEO compensation suggested by the estimates are very large: 84% on TDC1 (Column 3), but it decreases to 35% on TDC1 when current firm controls are included (Column 4), and to 38% on TDC2 in the specification without current firm controls (Column 7). The results in Schoar and Zuo (2012) are obtained with a smaller number of observations and are stronger for the recession year indicator than for the top-ten indicator. Our results further support the findings from *our* Table 8 that the first CEO pay (at least for the compensation measured by TDC1) may be as much as 30% higher if the individual started her career in a top-ten public company.

[28]The industries are identified according to the first SIC digit.

4.2 Robustness analysis

If all individuals in our sample were movers, that is, if all CEOs could be observed in at least one other firm, employing firm fixed effects would be a useful strategy to quantify the first firm size effects. As discussed above, this is not the case, thus the coefficient estimates of first firm size may be conflated (firm fixed effects wipe out the time-constant between-manager variation). These estimates may also be otherwise altered due to possible omitted variable bias.

Despite the data issues, we can still get an idea of a distortion in coefficient estimates if we perform cross-section regressions for selected years.[29] Table 10 reports the results from such cross-section regressions, with market capitalization as the measure for firm size. (Table OA10 in Online Appendix 10 reports the results with total assets as the control for firm size.) The selected years are 1995, 2000 and 2005. 2005 is the year with the largest number of observations, 1995 and 2000 were selected to representatively cover and be evenly spread out throughout the data period 1992-2007. When we compare the magnitudes, signs and statistical significance of coefficients in Table 2 to the ones in Table 10 (or, alternatively, those in Table OA3 to the ones in Table OA10), the coefficients of the control variables remain rather stable. The coefficients of interest are low in magnitude, not very different from to the ones obtained in the benchmark regressions with firm fixed effects. The estimated coefficients on first firm size are not statistically significant at conventional levels. Only *First Market Capitalization* is positively associated with the 2000 TDC1 compensation at the 5% level (Column 2 in Panel B of Table 10); similarly for *First Total Assets* and TDC2 in Column 6 in Panel A of Table OA10.[30]

[29] Hermalin and Weisbach (1991) use one-year regression as a robustness check to a model driven by between-firm variation, a model where using firm-fixed effects may be fallacious.

[30] On an interesting note, the results in both Table OA9 and Table OA10 suggest that in the mid-nineties, female CEO may have earned significantly less than male CEOs. 1995 is the year with least observations so this may affect the results but the 1% significance holds not only for the full sample but for Subsample 2 as well.

We make another attempt for instrumental variables estimation with a set of employment-related variables (the US annual employment rate, the US annual employment growth rate, and the interaction term of the former two variables). In the context of studying cohort effect in promotions, Kwon et al. (2010) find that employment rate in interaction with the employment growth rate matter more than the unemployment rate alone. The key to this argument is that the employment growth rate is a variable reflecting economic prospects, a forward-looking variable. Reported in Table OA11 in the Online Appendix 11, all tests, from partial correlations and first-stage R-squared through weak identification tests and endogeneity tests, indicate that we are probably better off without engaging in 2SLS estimation. The coefficients on *First Firm Size* are not statistically significant at conventional levels, they may carry very large bias and thus be misleading. Nevertheless, our tests with alternative instruments can be credited with a careful evaluation of theoretical arguments supported by previous empirical research.

Advances in instrumental variables estimation due to the work of Moreira (2003) and Mikusheva (2010) allow for weak-instrument robust testing with conditional likelihood ratio (CLR) confidence sets. We report these results in Table 11. The first row of each panel contains the coefficient estimates of *First Market Capitalization* obtained through normal approximation. We include this coefficient's limited information maximum likelihood (LIML) estimates for comparison as well as some first-stage diagnostics. Columns (3) and (6) of each panel contain perhaps the most important results - the results from LSDV estimation with year and industry dummies.[31] With the financial-markets-related and the employment-rate-related sets of instruments, we find CLR confidence sets with a rather large span (the p-values are large but so are the sets). When the set of macro variables is used as instruments, the CLR confidence sets become narrower. The results are strongly statistically significant and

[31]The data does not support fixed-effect 2SLS estimation. Also, the results for TDC1 are likely to be less erratic (although one may argue that the Black and Scholes model is not the most appropriate to determine the value of the stock options granted). TDC2 includes the value of exercised stock options, thus it is more likely to be affected by measurement error.

suggest a negative effect of first firm size on CEO compensation. The suggested first firm size elasticity relative to CEO compensation varies between -0.1 and -0.8% (taking into account all CLR-confidence-set results in Column (3) in all panels of Table 11). The negative sign lends support to the countercyclical cohort effects theory: individuals who due to the bad economy started their careers in smaller firms on average, earn higher CEO compensation. Thus, again, to succeed and be hired in a bad economy could be a sign of higher ability. During recessions, firms may apply stricter selection processes in order to find the best match, the most able employees. When performing the weak instrument robust testing with Subsample 2 (untabulated results), the results suggest positive effects which, in most cases, are not statistically significant at conventional levels. Cohort effects seem to be inexistent in CEO compensation when we pick observations with the earliest possible stages of the individuals' careers but we have to keep in mind the much lower number of observations used to obtain these results.

5 Conclusion

Several recent papers study the possible influence of initial career conditions on individuals' current professional situation. They find that a good economy makes it more likely to start one's career in a position with better opportunities and plays a role in shaping one's career path in the long term. So much so that those whose initial placement is a worse match may not be able to catch up to their luckier peers. We study CEOs in publicly listed companies and investigate whether the conditions at the time these individuals start their careers influence their current CEO compensation. Do CEOs whose job market entry coincides with a bad economy earn less than their counterparts who started their first job assignment in peaks and booms?

We test the influence of the quality of initial placement through pooled ordinary least

squares, least square dummy variables and fixed effects regressions, as well as instrumental variables regressions. We do not find evidence that first firm size has a persistent procyclical effect on CEO compensation. Thus, the niche of the job market seems to play a role in how persistent first job effects are. Even if first positions influence subsequent job attainment and compensation, more than two decades into the individuals' careers this effect seems to disappear when it comes to (future) CEOs. The several layers of selection - selection based on following only future CEOs and selection due to different initial macroeconomic conditions for each cohort - represent more of an issue if a long-term significant effect is at work. Our principal finding (lack of a long-term significant effect) hence alleviates the data selection concerns to some extent. The results from instrumental variables estimation lend support to the notion of countercyclical cohort effects in CEO compensation.

Our results from cross-section regressions suggest that initial career conditions (firm size, top-ten firm) have a large effect on the *first* CEO compensation. A large part of the pay increase - as much as 30% - comes from factors positively correlated with initial job conditions. The increase in first CEO compensation due to initial job conditions dissipates over time, suggesting efficient workings of the executive job market. A number of robustness checks support these conclusions.

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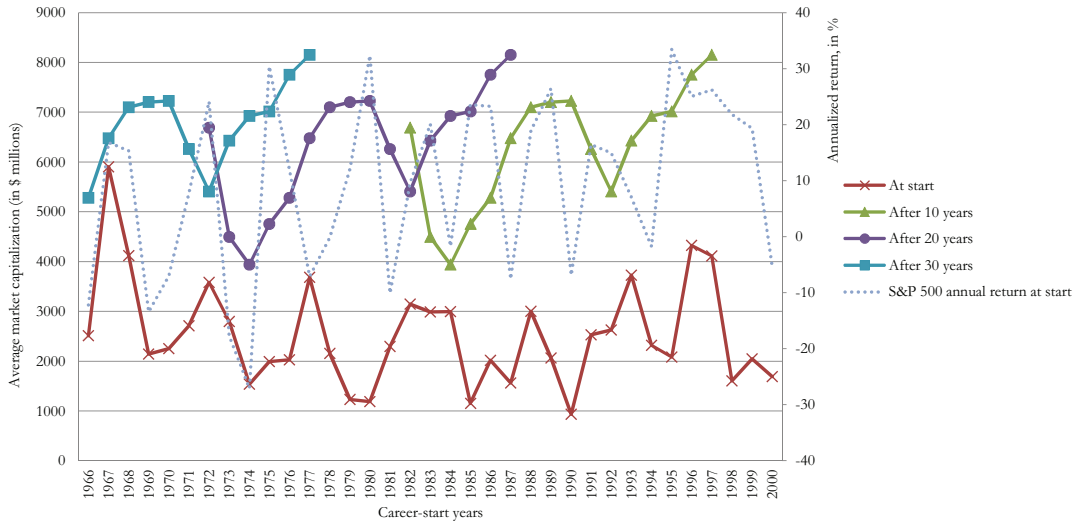
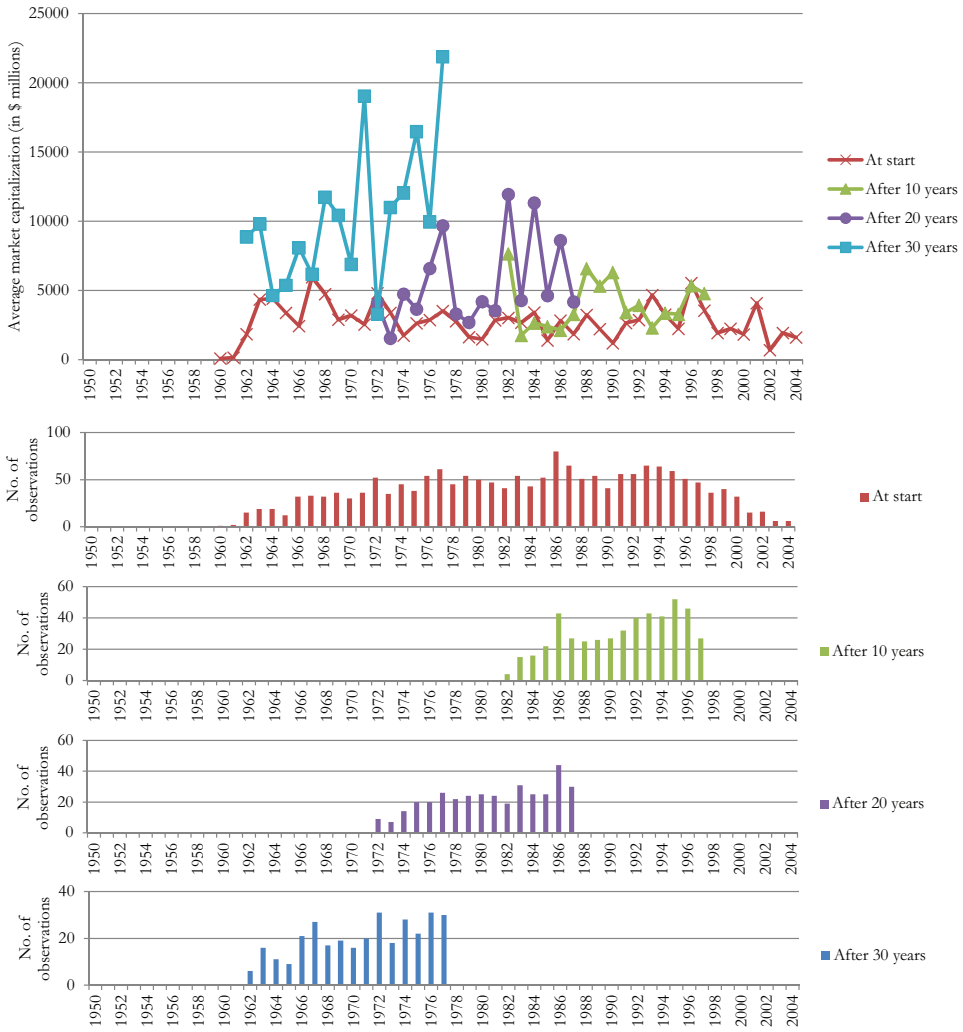
Figure 1: The evolution of in-sample average firm size throughout CEOs' careers (full sample‡)



‡ Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.
The figure shows the evolution of in-sample average firm size as measured by market capitalization. The (red) line with cross markers shows the average firm size at the start of individuals' careers . There are at least 30 entries for each initial year and around 300 entries for each data point of the decades thereafter. The (green) line with triangle markers shows the average market capitalization 10 years after, the (violet) line with circle markers after 20 years and the (blue) line with square markers after 30 years. For example, moving up on an imaginary vertical line from the 1985-value on the (red) line with cross markers, crossing the (green) line with triangle markers represents the average firm size in 1995 and crossing the (violet) line with circle markers shows the average firm size in 2005. Since the current firm size measures are available for 1992-2007, there is attrition in the plots. Thus, corresponding to the 1975 initial average firm size, we are only able to plot the 1995 (after 20 years) and 2005 (after 30 years) average firm sizes on the (violet) line with circle markers and the (blue) line with square markers, respectively.
In order to depict the initial market conditions (financial market conditions are probably more relevant for our measure of firm size), we plot the annual S&P 500 index return for the career-start years.

Figure 2: Average firm size throughout CEOs' careers

(following the same cohorts of CEOs through time)



The figure plots the average market capitalizations only for firms where the can trace the same individuals for 10 years, 20 years or 30 years. Thus we focus on the same cohort of future CEOs through time. The lower portions of the graph show the numbers of observations used to compute the average firm size at the start of the individula's career, and after 10, 20 and 30 years, respectively.

Table 1: Summary statistics (full sample[‡])

	Variable	No. of obs.	Mean	Std. dev.	Median	Min.	Max.
Response variables	(Total compensation 1)$_t$[†] [*$thousands*]	13268	4232.26	5315.96	2329.19	261.5	32164.63
	(Total compensation 2)$_t$[†] [*$thousands*]	13369	4267.77	7028.64	1808.20	219.953	46339.73
	(Total compensation 1)$_{t-k}$[†□] [*$thousands*]	2981	3558.11	4972.20	1856.97	234.474	32372.49
	(Total compensation 2)$_{t-k}$[†□] [*$thousands*]	3040	2615.79	3697.47	1257.04	146.355	22911.81
Main explanatory variables	(Market capitalization)$_{t-k}$[†] [*$millions*]	11148	2568.19	6625.40	434.54	5.7239	40369.69
	(Total assets)$_{t-k}$[†] [*$millions*]	13310	2271.09	5528.43	368.55	3.2000	37243.01
	(Top ten *indicator*)$_{t-k}$	13378	0.0542	0.2264	0.0000	0	1
	(No. of employees)$_{t-k}$[†◊] [*thousands*]	13280	2128.32	4991.41	412.22	1.4640	32657
	Sales$_{t-k}$[†◊] [*$millions*]	12641	30.49	65.86	5.86	0.0300	380
Firm-level controls	(Market capitalization)$_t$[†] [*$millions*]	13378	6450.42	15747.51	1580.89	58.0108	112732.3
	(Total assets)$_t$[†] [*$millions*]	13378	5072.50	9551.45	1498.34	72.577	59920.0
	(Market to book)$_{t-1}$[†]	13378	2.0542	1.3333	1.5958	0.8043	8.3404
	(Stock return)$_t$[†]	13378	0.0070	0.0322	0.0084	-0.0965	0.0976
	(Return on assets)$_t$[†]	13378	0.1425	0.0886	0.1386	-0.2003	0.3800
	(Stock return volatility over 5 years)$_t$[†]	13378	0.0314	0.0203	0.0256	0.0058	0.1035
CEO-level controls	(CEO tenure)$_t$ [*months*]	13369	105.83	92.75	78	6	690
	(External hire *indicator*)$_t$	13378	0.4152	0.4928	0	0	1
	(CEO & Chairman *indicator*)$_t$	13378	0.6531	0.4760	1	0	1
	MBA degree *indicator*	13378	0.3100	0.4625	0	0	1
	Female *indicator*	13378	0.0155	0.1234	0	0	1
Excluded instruments	(Recession *indicator*)$_{t-k}$	13378	0.1218	0.3270	0	0	1
	(Recession year *indicator*)$_{t-k}$[°]	13378	0.8651	0.3417	1	0	1
	(US unemployment rate, 12-month average)$_{t-k}$ [%]	13378	6.1839	1.4688	6.0000	2.9000	10.2000
	(Investment-grade bond yield spread)$_{t-k}$ [%]	13378	1.0516	0.4566	0.9300	0.3200	2.6900
	(S&P 500 volume, 1-year change)$_{t-k}$[†] [%]	13375	17.852	26.342	14.714	-25.329	89.478
	(S&P 500 average return over 1 year)$_{t-k}$[†] [%]	13368	9.9946	15.279	12.309	-29.718	38.736
	(S&P 500 st. deviation over 2 years)$_{t-k}$[†] [%]	13364	364.73	475.77	178.45	26.482	2216.35
	(US employment rate, 12-month average)$_{t-k}$ [%]	13378	93.816	1.4688	94.000	89.800	97.100
	(US employment annual growth rate)$_{t-k}$ [%]	13378	-0.0003	0.0895	0.0000	-0.3254	0.3289

Notes:
[‡] Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.
[†]: Winsorized variables
[◊]: Included for a more comprehensive firm characterization, results with these regressors are not reported in the paper.
[□]: For the regressions on *First CEO Compensation*, the sample is restricted to the cross-section that captures each individual's first CEO assignment.
[°]: As in Schoar and Zuo (2012)

The table presents summary statistics for the regressands and regressors that we include in our tests. It contains the numbers of observations, means, standard deviations, medians, minima and maxima for both continuos and indicator variables. Where applicable, the units of measurement are indicated in square brackets. All dummy variables are designated "indicator". *t* refers to current values, *t-1* to lagged values and *t-k* to values at career start. For a more detailed description of the variables, see Table A2 in Appendix 2. Variables that can take extreme values (e.g., variables computed as a fraction), or variables very likely to be affected by measurement errors are winsorized. The fraction of observations modified in each tail is 1%, i.e. we modify the values below the 1st percentile and above the 99th percentile. Winsorization is applied in order to prevent results from being heavily influenced by outliers. The summary statistics are based on the full sample.

Table 2: Pooled OLS, least square dummy variable and fixed effects regressions with *First Market Capitalization* as the main regressor

Panel A: Full sample regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Market capitalization)$_{t-k}$	0.0275***	0.0182**	0.0179**	0.0152	0.0199**	0.00287	0.00340	-0.000224
	(3.31)	(2.23)	(2.28)	(1.24)	(2.15)	(0.32)	(0.39)	(-0.02)
Log(Market capitalization)$_{t-1}$	0.454***	0.438***	0.449***	0.311***	0.440***	0.413***	0.424***	0.350***
	(42.74)	(41.29)	(43.15)	(11.67)	(37.82)	(36.06)	(37.36)	(12.53)
(Market to book)$_{t-1}$	-0.0513***	-0.0525***	-0.0759***	0.00586	-0.0563***	-0.0526***	-0.0678***	0.0283
	(-4.14)	(-4.23)	(-5.59)	(0.38)	(-4.04)	(-3.89)	(-4.53)	(1.50)
(Stock return)$_t$	3.249***	3.638***	3.792***	3.240***	6.301***	6.627***	6.747***	6.274***
	(11.08)	(11.61)	(12.07)	(9.92)	(19.80)	(19.32)	(19.71)	(16.98)
(Stock return)$_{t-1}$	1.484***	1.642***	2.019***	1.205***	4.682***	4.869***	5.120***	3.675***
	(5.40)	(5.74)	(7.13)	(4.85)	(13.86)	(13.92)	(14.60)	(11.18)
(Return on assets)$_t$	0.272	0.464***	0.281*	0.781***	1.057***	1.248***	1.102***	1.719***
	(1.63)	(2.81)	(1.71)	(4.32)	(5.17)	(6.31)	(5.56)	(8.19)
(Return on assets)$_{t-1}$	-0.388**	-0.330**	-0.414***	-0.131	-0.669***	-0.433**	-0.510**	-0.346*
	(-2.44)	(-2.04)	(-2.59)	(-0.79)	(-3.35)	(-2.18)	(-2.56)	(-1.67)
(Stock return volatility over 5 years)$_t$	6.801***	5.653***	4.451***	1.913**	3.429***	2.643***	1.928***	-0.284
	(10.22)	(8.35)	(6.48)	(2.54)	(4.86)	(3.74)	(2.70)	(-0.34)
Log(CEO tenure)$_t$	0.00167	-0.0212	-0.0268*	-0.00409	0.140***	0.0894***	0.0852***	0.126***
	(0.11)	(-1.37)	(-1.80)	(-0.29)	(8.55)	(5.57)	(5.40)	(8.18)
(External hire indicator)$_t$	0.0817***	0.0809***	0.0955***	0.131***	-0.000892	0.00669	0.0173	-0.000126
	(2.62)	(2.66)	(3.32)	(3.13)	(-0.03)	(0.21)	(0.56)	(-0.00)
(CEO & Chairman indicator)$_t$	0.106***	0.158***	0.168***	0.0229	0.0677**	0.168***	0.173***	0.0315
	(3.59)	(5.41)	(5.94)	(0.86)	(2.11)	(5.42)	(5.75)	(1.01)
MBA degree indicator	0.103***	0.0886***	0.0764***	0.0476	0.101***	0.0814***	0.0747**	0.0294
	(3.65)	(3.18)	(2.92)	(1.35)	(3.14)	(2.63)	(2.50)	(0.64)
Female indicator	0.0556	-0.00981	-0.0362	0.141	0.0963	-0.00371	-0.0212	0.0551
	(0.50)	(-0.09)	(-0.32)	(1.22)	(0.81)	(-0.03)	(-0.18)	(0.46)
Constant	4.044***	3.585***	3.634***	4.379***	3.482***	3.206***	3.210***	3.521***
	(37.60)	(27.86)	(29.13)	(20.10)	(29.43)	(23.59)	(24.20)	(15.26)
Year dummies		yes	yes	yes		yes	yes	yes
Industry dummies			yes				yes	
Firm fixed effects				yes				yes
No. of obs.	11001	11001	11001	11001	11066	11066	11066	11066
Adj. R^2	0.470	0.503	0.523	0.716	0.428	0.488	0.498	0.668

Panel B: Subsample 1 regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Market capitalization)$_{t-k}$	0.0316***	0.0213**	0.0216**	0.00805	0.0287***	0.00956	0.0108	-0.000512
	(3.63)	(2.44)	(2.56)	(0.55)	(2.89)	(0.99)	(1.13)	(-0.03)
No. of obs.	8425	8425	8425	8425	8468	8468	8468	8468
Adj. R^2	0.469	0.504	0.526	0.730	0.430	0.494	0.506	0.684

Panel C: Subsample 2 regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log(Market capitalization)$_{t-k}$	0.0337***	0.0257**	0.0185	0.0443	0.0222	0.00838	0.00424	0.0785*
	(2.80)	(2.16)	(1.62)	(1.25)	(1.61)	(0.64)	(0.33)	(1.85)
No. of obs.	3752	3752	3752	3752	3767	3767	3767	3767
Adj. R^2	0.513	0.553	0.575	0.744	0.454	0.520	0.530	0.684

‡ Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

The table reports results from pooled OLS regressions (columns 1 and 5), LSDV regressions with year dummies (columns 2 and 6) and with year and industry dummies (columns 3 and 7), and with year and firm fixed effects (columns 4 and 8). The firm fixed effects model gives a separate constant term for each firm, the intercept ("Constant") included in columns 4 and 8 is the average value of the fixed effects. Panels A, B and C report results from regression on the full sample, Subsample 1 and Subsample 2, respectively, although Panels B and C only report the coefficients on the main regressor. The response variables are log(TDC1) (columns 1-4) and log(TDC2) (columns 5-8). The main regressor variable is *First Market Capitalization,* thus the control for current firm size is (lagged, log-transformed) market capitalization as well. The choice of the remaining determinants of CEO compensation follows Graham et al. (2012). For a more detailed description of the variables, see Table A2 in Appendix 2. For more detailed results from estimation corresponding to Panels B and C, see Table OA2 in Online Appendix 2.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 3: Instrumental variables regressions with *First Market Capitalization* as the instrumented variable (full sample‡)

Panel A: Regressions using a set of financial-markets-related excluded instruments

	Log(Total compensation 1)$_t$			**Log(Total compensation 2)$_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}^{\Delta}$	0.0113	-0.495*	-0.435*	0.196*	-0.564**	-0.483*
	(0.11)	(-1.89)	(-1.90)	(1.65)	(-1.97)	(-1.95)
Log(Market capitalization)$_{t-1}$	0.462***	0.680***	0.661***	0.353***	0.681***	0.652***
	(9.14)	(5.53)	(6.17)	(5.84)	(5.05)	(5.64)
(Market to book)$_{t-1}$	-0.0520***	-0.0718***	-0.0945***	-0.0484***	-0.0734***	-0.0870***
	(-3.83)	(-3.22)	(-4.23)	(-3.00)	(-3.07)	(-3.73)
(Stock return)$_t$	3.258***	3.868***	4.012***	6.201***	6.898***	6.991***
	(11.12)	(8.98)	(9.82)	(18.56)	(14.27)	(15.64)
(Stock return)$_{t-1}$	1.445***	0.284	0.872	5.090***	3.417***	3.924***
	(3.97)	(0.36)	(1.26)	(10.87)	(3.95)	(5.24)
(Return on assets)$_t$	0.274	0.623**	0.459*	1.040***	1.396***	1.272***
	(1.63)	(2.38)	(1.81)	(4.85)	(4.72)	(4.53)
(Return on assets)$_{t-1}$	-0.414*	-1.076**	-1.078***	-0.386	-1.238**	-1.210***
	(-1.78)	(-2.37)	(-2.66)	(-1.36)	(-2.42)	(-2.65)
(Stock return volatility over 5 years)$_t$	6.844***	6.664***	5.140***	2.950***	3.797***	2.689**
	(9.58)	(5.08)	(4.34)	(3.63)	(2.63)	(2.12)
Log(CEO tenure)$_t$	-0.00717	-0.315**	-0.282**	0.236***	-0.235	-0.189
	(-0.13)	(-2.04)	(-2.11)	(3.50)	(-1.39)	(-1.32)
(External hire indicator)$_t$	0.0970	0.564**	0.524**	-0.167	0.540*	0.477**
	(0.99)	(2.23)	(2.35)	(-1.42)	(1.95)	(1.99)
(CEO & Chairman indicator)$_t$	0.107***	0.231***	0.229***	0.0544	0.247***	0.237***
	(3.48)	(3.57)	(4.01)	(1.52)	(3.53)	(3.90)
MBA degree indicator	0.106***	0.152**	0.137**	0.0759*	0.153**	0.140**
	(3.34)	(2.43)	(2.40)	(1.91)	(2.20)	(2.25)
Female indicator	0.0686	0.363	0.293	-0.0424	0.400	0.326
	(0.49)	(1.23)	(1.10)	(-0.30)	(1.23)	(1.13)
Year dummies		yes	yes		yes	yes
Industry dummies			yes			yes
No. of obs.	11001	11001	11001	11066	11066	11066
R^2 (centered)	0.4703	-0.2502	-0.0884	0.3635	-0.3032	-0.1070
Overidentification test of all instruments - Hansen J stat. (p-val)	1.978	0.562	0.476	0.054	0.001	0.086
	(0.3719)	(0.7552)	(0.7884)	(0.9732)	(0.9997)	(0.9581)
Endogeneity test of endogenous regressor	0.015	11.718	10.851	2.587	11.809	10.002
	(0.9013)	(0.0006)	(0.0010)	(0.1078)	(0.0006)	(0.0016)
First stage	**Log(Market capitalization)$_{t-k}$**					
(S&P 500 volume, 1-yr % change)$_{t-k}$	0.0004***	0.0003	0.0002	0.0004	0.0003	0.0002
	(0.26)	(0.20)	(0.12)	(0.27)	(0.20)	(0.14)
(S&P 500 return, 1-yr)$_{t-k}$	0.0009	0.0008	0.0017	0.0009	0.0008	0.0017
	(0.29)	(0.24)	(0.56)	(0.30)	(0.25)	(0.56)
(S&P 500 standard deviation, 2-yr)$_{t-k}$	0.0003***	0.0002**	0.0002**	0.0003***	0.0002**	0.0002**
	(3.63)	(2.34)	(2.30)	(3.58)	(2.29)	(2.25)
R^2 (centered)	0.2654	0.2572	0.2510	0.2654	0.2572	0.2510
Weak identification test[1]: Cragg-Donald Wald F statistic/ Kleibergen-Paap Wald rk F statistic	22.46	10.02	11.17	22.28	9.77	10.96
	5.15	2.15	2.31	5.02	2.07	2.23

(continued)

Table 3 *(continued)*

Panel B: Regressions using a set of proxies for macroeconomic conditions as excluded instruments

	Log(Total compensation 1)$_t$			**Log(Total compensation 2)$_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}^{\Delta}$	-0.182	-0.262*	-0.246*	0.0149	-0.0831	-0.0646
	(-1.54)	(-1.89)	(-1.87)	(0.13)	(-0.72)	(-0.59)
Log(Market capitalization)$_{t-1}$	0.558***	0.570***	0.573***	0.443***	0.454***	0.455***
	(9.50)	(8.76)	(9.34)	(7.90)	(8.38)	(8.80)
(Market to book)$_{t-1}$	-0.0609***	-0.0630***	-0.0867***	-0.0565***	-0.0557***	-0.0705***
	(-4.07)	(-3.90)	(-5.04)	(-3.82)	(-3.87)	(-4.48)
(Stock return)$_t$	3.361***	3.763***	3.920***	6.304***	6.668***	6.781***
	(10.71)	(10.82)	(11.31)	(19.61)	(19.13)	(19.61)
(Stock return)$_{t-1}$	0.978**	0.901*	1.350***	4.671***	4.648***	4.953***
	(2.35)	(1.83)	(2.92)	(10.77)	(10.10)	(11.07)
(Return on assets)$_t$	0.303	0.550***	0.385*	1.058***	1.270***	1.125***
	(1.63)	(2.73)	(1.90)	(5.16)	(6.23)	(5.48)
(Return on assets)$_{t-1}$	-0.731***	-0.737***	-0.802***	-0.677**	-0.555**	-0.608**
	(-2.87)	(-2.72)	(-3.08)	(-2.51)	(-2.13)	(-2.37)
(Stock return volatility over 5 years)$_t$	7.355***	6.205***	4.853***	3.443***	2.818***	2.034***
	(8.86)	(6.79)	(5.46)	(4.51)	(3.67)	(2.71)
Log(CEO tenure)$_t$	-0.113*	-0.181**	-0.176**	0.137**	0.0401	0.0469
	(-1.69)	(-2.21)	(-2.29)	(2.20)	(0.59)	(0.73)
(External hire indicator)$_t$	0.280**	0.345**	0.346***	0.00386	0.0876	0.0816
	(2.38)	(2.53)	(2.67)	(0.03)	(0.78)	(0.76)
(CEO & Chairman indicator)$_t$	0.122***	0.198***	0.203***	0.0680**	0.180***	0.182***
	(3.42)	(4.58)	(4.99)	(2.02)	(4.93)	(5.23)
MBA degree indicator	0.132***	0.123***	0.112***	0.101***	0.0922***	0.0839**
	(3.48)	(2.93)	(2.77)	(2.86)	(2.63)	(2.47)
Female indicator	0.224	0.194	0.156	0.100	0.0575	0.0273
	(1.24)	(0.99)	(0.83)	(0.66)	(0.36)	(0.18)
Year dummies		yes	yes		yes	yes
Industry dummies			yes			yes
No. of obs.	11001	11001	11001	11066	11066	11066
R^2 (centered)	0.3567	0.2559	0.2870	0.4287	0.4185	0.4285
Overidentification test of all instruments - Hansen J stat. (p-val)	0.285	0.686	0.313	0.921	0.243	0.312
	(0.8674)	(0.7097)	(0.8550)	(0.6310)	(0.8858)	(0.8554)
Endogeneity test of endogenous regressor	3.917	6.540	6.518	0.001	0.571	0.367
	(0.0478)	(0.0105)	(0.0107)	(0.9737)	(0.4499)	(0.5444)
First stage	**Log(Market capitalization)$_{t-k}$**					
(Recession indicator)$_{t-k}$	-0.2575	-0.2327	-0.2528	-0.2571	-0.2319	-0.2526
	(-1.63)	(-1.48)	(-1.61)	(-1.63)	(-1.47)	(-1.61)
(Investment-grade-bond yield spread)$_{t-k}$	-0.1538	-0.1518	-0.1556	-0.1554	-0.1537	-0.1576
	(-1.21)	(-1.20)	(-1.22)	(-1.22)	(-1.21)	(-1.24)
(US unemployment rate, 12-m. avg.)$_{t-k}$	-0.0333	-0.0306	-0.0238	-0.0329	-0.0303	-0.0236
	(-0.88)	(-0.81)	(-0.64)	(-0.87)	(-0.80)	(-0.63)
R^2 (centered)	0.2661	0.2599	0.2535	0.2662	0.2600	0.2536
Weak identification test[1]: Cragg-Donald Wald F statistic/ Kleibergen-Paap Wald rk F statistic	25.99	23.26	23.72	26.17	23.45	23.99
	3.09	2.75	2.78	3.10	2.75	2.79

‡: Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

$^{\Delta}$: instrumented variable

[1]The Stock-Yogo (2005) weak identification critical values (valid for Cragg-Donald F statistic and i.i.d. errors) for 1 endogenous variable and 3 excluded instruments are as follows:

5% maximal IV relative bias	13.91	10% maximal IV size	22.30
10% maximal IV relative bias	9.08	15% maximal IV size	12.83
20% maximal IV relative bias	6.46	20% maximal IV size	9.54
30% maximal IV relative bias	5.39	25% maximal IV size	7.80

The table reports results from IV regressions on the full sample - pooled 2SLS estimation (columns 1 and 4), with year dummies (columns 2 and 5) and with year and industry dummies (columns 3 and 6). The data does not support fixed effects 2SLS estimation. Panels A and B report results from regressions with two different sets of excluded instruments, financial-markets-related and macroeconomic-conditions-related, respectively. The dependent variables are log(TDC1) (columns 1-3) and log(TDC2) (columns 4-6). The explanatory variable of interest - the instrumented variable - is *First Market Capitalization*. The remaining controls (included instruments) correspond to those in Table 2. For a more detailed description of the variables, see Table A2 in Appendix 2. In addition to the coefficient estimates, second-stage-regression R^2 and the number of observations, we also include results from overidentification and endogeneity tests. These results together with first-stage test results are important indicators for intrument validity and strength, and may reveal large inefficiencies in 2SLS estimation.

The lower sections of the table refer to first-stage results. It contains selected coefficent estimates (for the excluded instruments only, omitting the included instruments' coefficent estimates) and results from tests for weak identification.

Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 4: Instrumental variable regressions using a single excluded instrument, with *First Market Capitalization* as the instrumented variable (full sample‡)

Panel A: Results with Log(Total compensation 1)$_t$ as the response variable

	Log(Total compensation 1)$_t$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(Market capitalization)$_{t-k}$ $^{\Delta}$	-0.152	-0.321	-0.207	-0.131	-1.174	-0.709	-0.383*
	(-0.92)	(-1.61)	(-1.30)	(-0.55)	(-0.27)	(-0.94)	(-1.73)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes
No. of obs.	11001	11001	11001	11001	11001	11001	11001
R^2 (centered)	0.4011	0.1615	0.3410	0.4193	-3.4587	-0.9843	0.0357
Endogeneity test of endogenous regressor	1.283	5.760	3.320	0.496	0.968	6.468	7.544
	0.2574	0.0164	0.0685	0.4814	0.3252	0.0110	0.0060
First stage	**Log(Market capitalization)$_{t-k}$**						
(Recession year indicator)$_{t-k}$ $^{\circ}$	0.2731**						
	(2.18)						
(Recession indicator)$_{t-k}$		-0.2891**					
		(-2.03)					
(Investment-grade-bond yield spread)$_{t-k}$			-0.2428**				
			(-2.46)				
(US unemployment rate, 12-m. avg.)$_{t-k}$				-0.0420			
				(-1.44)			
(S&P 500 volume, 1-yr % change)$_{t-k}$					0.0005		
					(0.29)		
(S&P 500 return, 1-yr)$_{t-k}$						0.0030	
						(1.04)	
(S&P 500 standard deviation, 2-yr)$_{t-k}$							0.0002**
							(2.57)
R^2 (centered)	0.2510	0.2511	0.2521	0.2497	0.2487	0.2493	0.2508
Weak identification test[1]: Cragg-Donald Wald F statistic/	33.25	34.69	49.84	15.29	0.63	8.25	30.65
Kleibergen-Paap Wald rk F statistic	4.74	4.12	6.03	2.08	0.08	1.08	6.59

Panel B: Results with Log(Total compensation 2)$_t$ as the response variable

	Log(Total compensation 2)$_t$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(Market capitalization)$_{t-k}$ $^{\Delta}$	-0.142	-0.0125	-0.0856	-0.168	-0.756	-0.361	-0.501*
	(-0.85)	(-0.09)	(-0.63)	(-0.66)	(-0.27)	(-0.77)	(-1.92)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes
No. of obs.	11066	11066	11066	11066	11066	11066	11066
R^2 (centered)	0.4045	0.4385	0.4209	0.3714	-0.8928	0.1325	-0.1469
Endogeneity test of endogenous regressor	0.424	0.012	0.484	0.594	0.419	1.377	9.523
	0.5149	0.9126	0.4866	0.4408	0.5173	0.2406	0.0020
First stage	**Log(Market capitalization)$_{t-k}$**						
(Recession year indicator)$_{t-k}$ $^{\circ}$	0.2768**						
	(2.21)						
(Recession indicator)$_{t-k}$		-0.2892**					
		(-2.03)					
(Investment-grade-bond yield spread)$_{t-k}$			-0.2440**				
			(-2.47)				
(US unemployment rate, 12-m. avg.)$_{t-k}$				-0.0422			
				(-1.45)			
(S&P 500 volume, 1-yr % change)$_{t-k}$					0.0005		
					(0.30)		
(S&P 500 return, 1-yr)$_{t-k}$						0.0030	
						(1.04)	
(S&P 500 standard deviation, 2-yr)$_{t-k}$							0.0002**
							(2.52)
R^2 (centered)	0.2633	0.2511	0.2522	0.2498	0.2488	0.2493	0.2508
Weak identification test[1]: Cragg-Donald Wald F statistic/	33.97	34.79	50.60	15.49	0.68	8.23	30.00
Kleibergen-Paap Wald rk F statistic	4.89	4.11	6.11	2.10	0.09	1.07	6.35

‡: Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.
$^{\Delta}$: instrumented variable
$^{\circ}$: Variable defined as in Schoar and Zuo (2012)
[1]The Stock-Yogo (2005) weak identification critical values (valid for Cragg-Donald F statistic and i.i.d. errors) for 1 endogenous variable and 1 excluded instrument are as follows:
10% maximal IV size 16.38
15% maximal IV size 8.96
20% maximal IV size 6.66
25% maximal IV size 5.53

The table reports selected coefficients from IV regressions with year and industry dummies on the full sample. As before, the data does not support fixed effects 2SLS estimation. The table contains results from regressions with Schoar and Zuo (2012)'s recession year indicator (col. 1) and each of the excluded instruments from the two sets, financial-markets-related and macroeconomic-conditions-related, separately (col. 2-7). The dependent variables are log(TDC1) (Panel A) and log(TDC2) (Panel B). The explanatory variable of interest - the instrumented variable - is *First Market Capitalization*. For a more detailed description of the variables, see Table A2 in Appendix 2. More detailed results from this estimation are in Table OA4 in Online Appendix 4.
In addition to the coefficient estimates, second-stage-regression R^2 and the number of observations, we also include results of endogeneity tests. Overidentification tests cannot be performed with a single excluded instrument.
The lower sections of the table contains selected first-stage results: coefficent estimates for the single excluded instruments (the included instruments' coefficent estimates are omitted) and results from tests for weak identification.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 5: Pooled OLS, least square dummy variable and fixed effects regressions with *First Firm Rank* as the main regressor (full sample‡)

Panel A: Full sample regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm rank (market capitalization)$_{t-k}$	0.304***	0.197***	0.197***	0.146*	0.256***	0.0840	0.0892	0.0412
	(5.23)	(3.50)	(3.65)	(1.66)	(4.02)	(1.39)	(1.51)	(0.43)
Firm rank (market capitalization)$_{t-1}$	2.234***	2.207***	2.263***	1.225***	2.113***	2.087***	2.136***	1.506***
	(38.15)	(38.06)	(40.67)	(9.45)	(33.77)	(34.48)	(36.08)	(11.76)
(Market to book)$_{t-1}$	-0.0304**	-0.0351***	-0.0611***	0.0316**	-0.0332**	-0.0363***	-0.0537***	0.0529***
	(-2.41)	(-2.79)	(-4.47)	(1.99)	(-2.37)	(-2.69)	(-3.61)	(2.86)
(Stock return)$_t$	2.793***	3.480***	3.626***	2.851***	5.844***	6.478***	6.588***	5.943***
	(9.42)	(11.05)	(11.48)	(8.80)	(18.12)	(18.77)	(19.14)	(16.34)
(Stock return)$_{t-1}$	1.770***	1.584***	1.992***	1.230***	4.982***	4.811***	5.093***	3.687***
	(6.41)	(5.54)	(7.07)	(4.92)	(14.79)	(13.87)	(14.65)	(11.23)
(Return on assets)$_t$	0.254	0.469***	0.277*	0.792***	1.050***	1.251***	1.097***	1.718***
	(1.50)	(2.84)	(1.69)	(4.27)	(5.05)	(6.33)	(5.55)	(8.14)
(Return on assets)$_{t-1}$	-0.384**	-0.275*	-0.350**	-0.0374	-0.655***	-0.384*	-0.452**	-0.276
	(-2.44)	(-1.74)	(-2.23)	(-0.23)	(-3.27)	(-1.95)	(-2.28)	(-1.34)
(Stock return volatility over 5 years)$_t$	6.099***	5.521***	4.118***	1.764**	2.552***	2.509***	1.597**	-0.324
	(9.10)	(8.17)	(5.96)	(2.31)	(3.52)	(3.51)	(2.20)	(-0.38)
Log(CEO tenure)$_t$	0.0190	-0.0159	-0.0221	-0.000890	0.156***	0.0943***	0.0893***	0.130***
	(1.17)	(-1.00)	(-1.46)	(-0.06)	(9.19)	(5.82)	(5.61)	(8.17)
(External hire indicator)$_t$	0.0543*	0.0605*	0.0735**	0.121***	-0.0293	-0.0129	-0.00395	-0.0101
	(1.68)	(1.95)	(2.52)	(2.81)	(-0.84)	(-0.40)	(-0.13)	(-0.21)
(CEO & Chairman indicator)$_t$	0.0921***	0.159***	0.172***	0.0289	0.0595*	0.169***	0.178***	0.0360
	(3.03)	(5.39)	(5.99)	(1.05)	(1.80)	(5.43)	(5.84)	(1.14)
MBA degree indicator	0.127***	0.105***	0.0900***	0.0463	0.126***	0.0965***	0.0874***	0.0262
	(4.36)	(3.70)	(3.37)	(1.28)	(3.82)	(3.08)	(2.86)	(0.57)
Female indicator	0.0724	-0.00274	-0.0306	0.146	0.105	0.00323	-0.0159	0.0671
	(0.65)	(-0.03)	(-0.28)	(1.23)	(0.95)	(0.03)	(-0.14)	(0.57)
Constant	6.220***	5.922***	6.039***	6.090***	5.599***	5.390***	5.463***	5.408***
	(72.80)	(52.15)	(55.21)	(54.97)	(61.30)	(47.94)	(49.64)	(44.08)
Year dummies		yes	yes	yes		yes	yes	yes
Industry dummies			yes				yes	
Firm fixed effects				yes				yes
No. of obs.	11008	11008	11008	11008	11073	11073	11073	11073
Adj. R^2	0.436	0.487	0.510	0.711	0.390	0.477	0.488	0.665

Panel B: Subsample 1 regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm rank (market capitalization)$_{t-k}$	0.328***	0.210***	0.209***	0.105	0.312***	0.125*	0.133*	0.0623
	(5.02)	(3.27)	(3.37)	(0.93)	(4.28)	(1.78)	(1.92)	(0.47)
Year dummies		yes	yes	yes		yes	yes	yes
Industry dummies			yes				yes	
Firm fixed effects				yes				yes
No. of obs.	8247	8247	8247	8247	8289	8289	8289	8289
Adj. R^2	0.441	0.489	0.513	0.725	0.397	0.481	0.493	0.682

Panel C: Subsample 2 regressions‡

	Log(Total compensation 1)$_t$				Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm rank (market capitalization)$_{t-k}$	0.356***	0.258***	0.209**	0.380	0.295***	0.140	0.114	0.461
	(3.92)	(2.95)	(2.49)	(1.49)	(2.88)	(1.47)	(1.22)	(1.47)
Year dummies		yes	yes	yes		yes	yes	yes
Industry dummies			yes				yes	
Firm fixed effects				yes				yes
No. of obs.	3751	3751	3751	3751	3766	3766	3766	3766
Adj. R^2	0.483	0.538	0.563	0.740	0.426	0.514	0.525	0.682

‡ Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

The table reports full-sample results (Panel A) and selected subsample results (Panels B and C) from pooled OLS regressions (columns 1 and 5), LSDV regressions with year dummies (columns 2 and 6) and with year and industry dummies (columns 3 and 7), and with year and firm fixed effects (columns 4 and 8). The firm fixed effects model gives a separate constant term for each firm, the intercept ("Constant") included in columns 4 and 8 is the average value of the fixed effects. The dependent variables are log(TDC1) (columns 1-4) and log(TDC2) (columns 5-8). The main regressor variable is *First Firm Rank* based on market capitalization. Correspondingly, the control for current firm size is (lagged) current firm rank. The remaining controls correspond to those in Table 2. For a more detailed description of the variables, see Table A2 in Appendix 2. More detailed results from Panels B and C are reported in Table OA5 in Online Appendix 5.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 6: Least squares dummy variable regressions with *Top Ten* as the main explanatory variable, with *Market capitalization* as the control for firm size

	Log(Total compensation 1)$_t$			Log(Total compensation 2)$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
(Top ten)$_{t-k}$	0.123**	0.112*	0.0989	0.0773	0.0550	0.0614
	(2.31)	(1.94)	(1.59)	(1.29)	(0.85)	(0.88)
Log(Market capitalization)$_{t-1}$	0.454***	0.446***	0.446***	0.425***	0.422***	0.406***
	(46.78)	(41.92)	(30.18)	(39.79)	(36.52)	(24.78)
(Market to book)$_{t-1}$	-0.0825***	-0.0666***	-0.0639***	-0.0687***	-0.0589***	-0.0498**
	(-5.77)	(-4.47)	(-3.24)	(-4.46)	(-3.59)	(-2.20)
(Stock return)$_t$	3.997***	4.291***	4.224***	6.703***	7.387***	7.613***
	(14.01)	(14.64)	(9.64)	(21.40)	(20.34)	(14.37)
(Stock return)$_{t-1}$	2.136***	2.337***	2.262***	5.063***	5.477***	6.138***
	(8.16)	(7.75)	(5.38)	(15.77)	(15.11)	(11.75)
(Return on assets)$_t$	0.214	0.255	0.343	1.095***	1.217***	1.513***
	(1.44)	(1.43)	(1.36)	(6.14)	(5.63)	(4.55)
(Return on assets)$_{t-1}$	-0.382***	-0.593***	-0.607**	-0.610***	-0.744***	-1.209***
	(-2.64)	(-3.57)	(-2.47)	(-3.41)	(-3.45)	(-3.51)
(Stock return volatility over 5 years)$_t$	4.459***	4.651***	4.112***	2.058***	2.254***	1.425
	(6.95)	(6.00)	(3.60)	(3.11)	(2.79)	(1.23)
Log(CEO tenure)$_t$	-0.0357***	-0.0110	-0.00525	0.0807***	0.111***	0.135***
	(-2.71)	(-0.75)	(-0.27)	(5.79)	(7.21)	(6.38)
(External hire indicator)$_t$	0.103***	0.120***	0.131***	0.00764	0.0185	0.00531
	(4.01)	(3.88)	(2.99)	(0.28)	(0.57)	(0.12)
(CEO & Chairman indicator)$_t$	0.164***	0.153***	0.163***	0.170***	0.174***	0.218***
	(6.22)	(5.13)	(4.02)	(6.02)	(5.52)	(5.21)
MBA degree indicator	0.0639**	0.0571**	0.0502	0.0620**	0.0406	0.0617
	(2.57)	(2.07)	(1.28)	(2.20)	(1.31)	(1.45)
Female indicator	-0.0272	-0.0593	-0.158	-0.0153	-0.00317	-0.103
	(-0.24)	(-0.42)	(-0.74)	(-0.13)	(-0.02)	(-0.48)
Constant	3.736***	3.655***	3.550***	3.265***	3.139***	3.066***
	(35.92)	(32.62)	(25.58)	(30.44)	(26.67)	(20.28)
Year dummies	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes
No. of obs.	13195	9989	4673	13285	10054	4700
Adj. R^2	0.515	0.523	0.566	0.493	0.503	0.533
Data‡	***Full sample***	***Subsample 1***	***Subsample 2***	***Full sample***	***Subsample 1***	***Subsample 2***

‡ Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

The table reports results from LSDV regressions with year and industry dummies. The current (lagged) firm size control is *Market capitalization*. Columns 1 and 4, 2 and 5, and 3 and 6, correspond to regressions on the full sample, Subsample 1 and Subsample 2, respectively. The dependent variables are log(TDC1) (columns 1-3) and log(TDC2) (columns 4-6). The main regressor variable is *Top Ten*, an indicator variable that equals one if the individual started his/her career in one of the following firms: Arthur Andersen, AT&T, DuPont, Ford, General Electric, General Motors, IBM, McKinsey, Procter&Gamble, Texas Instruments (Schoar and Zuo, 2012, p. 9). The remaining controls correspond to those in Table 2. For a more detailed description of the variables, see Table A2 in Appendix 2.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 7: "Reduced-form" regressions with macroeconomic conditions at the start of the first job or at graduation as the main explanatory variables (full sample‡), with *Market capitalization* as the control for firm size

Panel A: Regressions on *Log(Total compensation 1)* $_t$

	Log(Total compensation 1)$_t$									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Recession year indicator)$_{t-k}$ °	0.00361					-0.0963***				
	(0.11)					(-2.85)				
(Recession indicator)$_{t-k}$		0.0410					-0.0265			
		(1.22)					(-0.75)			
(US unemployment rate, 12-m. avg.)$_{t-k}$			0.000856					-0.00677		
			(0.11)					(-0.75)		
(Investment-grade-bond yield spread)$_{t-k}$				0.00954					0.0239	
				(0.38)					(0.75)	
(S&P 500 return, 1-yr)$_{t-k}$					0.00731					-0.104
					(0.09)					(-1.26)
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. of obs.	13766	13766	13689	13766	13609	10580	10580	10508	10580	10412
Adj. R^2	0.510	0.511	0.510	0.511	0.511	0.521	0.520	0.521	0.520	0.521
Initial conditions at *t-k* refer to:	**macro conditions at the time of the first job**					**macro conditions at the time of graduation**				

Panel B: Regressions on *Log(Total compensation 2)* $_t$

	Log(Total compensation 2)$_t$									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Recession year indicator)$_{t-k}$ °	0.00913					-0.0580				
	(0.27)					(-1.60)				
(Recession indicator)$_{t-k}$		0.00769					-0.0420			
		(0.22)					(-1.08)			
(US unemployment rate, 12-m. avg.)$_{t-k}$			-0.00244					-0.0160		
			(-0.29)					(-1.56)		
(Investment-grade-bond yield spread)$_{t-k}$				-0.00962					-0.0351	
				(-0.37)					(-1.02)	
(S&P 500 return, 1-yr)$_{t-k}$					0.0567					-0.0898
					(0.69)					(-0.99)
Year dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. of obs.	13861	13861	13782	13861	13698	10643	10643	10570	10643	10471
Adj. R^2	0.487	0.487	0.487	0.487	0.487	0.491	0.491	0.493	0.491	0.493
Initial conditions at *t-k* refer to:	**macro conditions at the time of the first job**					**macro conditions at the time of graduation**				

‡ Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.
°: Variable defined as in Schoar and Zuo (2012).

The table reports selected results from LSDV regressions with year and industry dummies, with *Market capitalization* as the lagged firm size contro, using the full sample. These are "reduced form" regressions since five of the variables that we used earlier as excluded instruments (see IV regressions in Tables 3 and 4) now appear directly in the main equation. Schoar and Zuo (2012)'s recession year indicator, our recession indicator, the US unemployment rate, the investment-grade-bond yield spread and the S&P 500 volatility are included to capture macroeconomic conditions at the time (*t-k*) of the first job - the first job as it appears in our data (columns 1-5), and at the time of graduation (columns 6-10). Since we do not have graduation information on all individuals, the number of observations in the regressions with macroeconomic conditions at the time of graduation is lower. The dependent variables are log(TDC1) (Panel A) and log(TDC2) (Panel B). For a more detailed description of the variables, see Table.A2 in Appendix 2.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 8: Cross-section regressions on *First CEO Compensation*

	First Log(Total compensation 1)$_t$						First Log(Total compensation 2)$_t$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log(Market capitalization)$_{t-k}$	0.0418***			0.0414***			0.0292***			0.0294**		
	(4.39)			(3.88)			(2.96)			(2.51)		
Log(Total assets)$_{t-k}$		0.0340***			0.0285***			0.0240***			0.0213*	
		(3.65)			(2.70)			(2.58)			(1.90)	
(Top ten)$_{t-k}$			0.270***			0.229***			0.0987			0.0546
			(4.01)			(3.23)			(1.40)			(0.73)
Log(Market capitalization)$_{t-1}$	0.437***		0.429***	0.432***		0.421***	0.388***		0.385***	0.377***		0.377***
	(31.88)		(35.45)	(27.40)		(29.63)	(29.28)		(31.85)	(24.20)		(26.07)
Log(Total assets)$_{t-1}$		0.374***			0.374***			0.344***			0.342***	
		(27.80)			(23.78)			(25.74)			(21.60)	
(Market to book)$_{t-1}$	-0.0156	0.162***	-0.0132	-0.0172	0.173***	-0.00183	-0.0448***	0.124***	-0.0329**	-0.0494**	0.125***	-0.0297
	(-1.02)	(10.89)	(-0.96)	(-0.82)	(8.73)	(-0.09)	(-2.76)	(7.69)	(-2.17)	(-2.28)	(5.94)	(-1.40)
(Stock return)$_t$	2.485***	1.993***	2.423***	2.400***	2.339***	2.682***	4.727***	4.282***	4.667***	5.412***	5.058***	5.333***
	(4.46)	(3.75)	(4.66)	(3.15)	(3.17)	(3.70)	(8.50)	(8.21)	(8.97)	(7.53)	(7.24)	(7.66)
(Stock return)$_{t-1}$	-0.0758	0.355	-0.257	-0.989	-0.477	-0.976*	4.145***	4.034***	3.464***	4.383***	4.299***	3.815***
	(-0.15)	(0.77)	(-0.57)	(-1.59)	(-0.79)	(-1.68)	(8.03)	(8.27)	(6.99)	(6.67)	(6.73)	(5.86)
(Return on assets)$_t$	0.598*	0.630**	0.525*	0.887**	0.992**	0.820*	1.408***	1.485***	1.414***	1.550***	1.774***	1.665***
	(1.85)	(2.07)	(1.71)	(2.04)	(2.32)	(1.93)	(4.21)	(4.72)	(4.47)	(3.34)	(3.94)	(3.69)
(Return on assets)$_{t-1}$	-0.664**	-0.00393	-0.468	-0.978**	-0.367	-0.826**	-1.123***	-0.637**	-1.081***	-1.381***	-0.884**	-1.359***
	(-2.15)	(-0.01)	(-1.61)	(-2.40)	(-0.92)	(-2.11)	(-3.47)	(-2.13)	(-3.59)	(-3.11)	(-2.09)	(-3.23)
(Stock return volatility over 5 years)$_t$	7.774***	7.588***	7.625***	7.480***	8.127***	8.618***	3.940***	4.204***	4.258***	3.897***	4.516***	4.979***
	(8.28)	(8.30)	(8.55)	(6.34)	(7.25)	(7.91)	(4.34)	(4.84)	(4.96)	(3.30)	(3.93)	(4.36)
Log(CEO tenure)$_t$	-0.0454***	-0.0613***	-0.0757***	-0.0475**	-0.0766***	-0.0836***	0.0495***	0.0459***	0.0302**	0.0539**	0.0349*	0.0248
	(-2.60)	(-3.78)	(-5.07)	(-2.32)	(-4.05)	(-4.80)	(2.82)	(2.95)	(2.04)	(2.53)	(1.90)	(1.41)
(External hire indicator)$_t$	0.210***	0.216***	0.237***	0.310***	0.305***	0.317***	0.0774**	0.0778**	0.0957***	0.134***	0.146***	0.163***
	(5.66)	(6.13)	(7.30)	(6.68)	(6.87)	(7.66)	(2.05)	(2.23)	(2.91)	(2.74)	(3.22)	(3.82)
(CEO & Chairman indicator)$_t$	0.0199	-0.0103	0.0149	-0.00848	-0.0233	0.00767	0.0214	-0.0151	0.0152	-0.0259	-0.0392	-0.00597
	(0.55)	(-0.29)	(0.44)	(-0.20)	(-0.57)	(0.20)	(0.57)	(-0.43)	(0.44)	(-0.57)	(-0.93)	(-0.14)
MBA degree indicator	0.0628*	0.0802**	0.0967***	0.0766*	0.102***	0.120***	0.0593*	0.0737**	0.0880***	0.0374	0.0613	0.0743*
	(1.92)	(2.50)	(3.18)	(1.87)	(2.59)	(3.17)	(1.74)	(2.26)	(2.77)	(0.88)	(1.56)	(1.93)
Female indicator	0.0283	0.0857	0.0760	-0.0346	0.0415	0.00922	0.101	0.142	0.131	0.103	0.149	0.123
	(0.29)	(0.85)	(0.81)	(-0.26)	(0.31)	(0.07)	(1.02)	(1.49)	(1.39)	(0.88)	(1.29)	(1.08)
Constant	4.091***	4.190***	4.428***	4.154***	4.221***	4.446***	4.009***	3.952***	4.196***	4.136***	4.005***	4.253***
	(34.48)	(32.96)	(41.73)	(28.69)	(26.64)	(35.22)	(34.50)	(31.90)	(38.88)	(29.00)	(26.43)	(32.30)
No. of obs.	2397	2933	2944	1560	1920	1929	2432	2987	3000	1581	1958	1968
Adj. R^2	0.423	0.359	0.394	0.442	0.382	0.414	0.370	0.329	0.346	0.361	0.326	0.339
Data‡	Subsample CS			Subsample CS1			Subsample CS			Subsample CS1		

‡: Table A1 in Appendix 1 summarizes the conditions applied to subsamples.
°: Variable defined as in Schoar and Zuo (2012).

The table reports results from cross-section regressions on Subsample CS (columns 1-3 and 7-9) and Subsample CS1 (Columns 4-6 and 10-12). These are obtained from the full sample by selecting only the observations corresponding to the individuals' first year as CEO. The dependent variable is thus *First CEO Compensation*, measured by log(TDC1) (Columns 1-6) and log(TDC2) (Columns 7-12). The main explanatory variables are, as before, *First Market Capitalization* (Columns 1, 4, 7 and 10), *First Total Assets* (Columns 2, 5, 8 and 11), and *Top Ten* (Columns 3, 6, 9 and 12). The remaining controls correspond to those in Table 2. For a more detailed description of the controls, see Table A2 in Appendix 2.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering within firms are in parentheses.

Table 9: Alternative regressions on *First CEO Compensation*

	First Log(Total compensation 1)$_t$				First Log(Total compensation 2)$_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Recession year indicator)$_{t-k}$	-0.0823	-0.0133			-0.0495	0.0109		
	(-1.24)	(-0.22)			(-0.74)	(0.18)		
(Top ten)$_{t-k}$			0.610***	0.299***			0.324***	0.0318
			(5.59)	(2.93)			(3.13)	(0.33)
Log(Total assets)$_t$		0.288***		0.288***		0.253***		0.253***
		(6.95)		(6.93)		(6.21)		(6.17)
Log(Sales)$_t$		0.0728*		0.0678*		0.0741*		0.0736*
		(1.84)		(1.71)		(1.89)		(1.87)
(Return on assets)$_t$		0.394**		0.406**		1.408***		1.409***
		(1.99)		(2.07)		(7.03)		(7.04)
Constant	6.770***	4.232***	6.717***	4.256***	6.794***	4.258***	6.761***	4.273***
	(20.98)	(14.15)	(21.51)	(14.31)	(23.82)	(16.34)	(24.38)	(16.59)
Decade dummies	yes	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes	yes
No. of obs.	2857	2857	2857	2857	2912	2912	2912	2912
Adj. R^2	0.039	0.264	0.049	0.267	0.015	0.227	0.018	0.227

The table reports results from cross-section regressions on Subsample CS. Table A1 in Appendix 1 summarizes the conditions applied to the subsamples.
We replicate the regressions in Tables IV and Panel B of Table V in Schoar and Zuo (2012). The dependent variable is *First CEO Compensation*, measured by log(TDC1) (Columns 1-4) and log(TDC2) (Columns 5-8). The main explanatory variables are the *Recession year indicator* and the *Top ten* indicator. In the even-numbered columns, controls for firm size and performance are included, following the original specifications. Schoar and Zuo (2012) control for decade and industry time-invariant effects. "Decade" is the decade in which the CEO was born and the "industry", identified according to the first SIC digit, corresponds to the industry in which the individual started his/her career. In the cross-section regressions, the *Recession year indicator* is not instrumented with year of birth plus average age at the start of the first job (in Schoar and Zuo's sample, the average age is 24, in our sample, it is 30). Table A2 in Appendix 2 contains a detailed description of the variables.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics are in parentheses.

Table 10: Cross-section OLS regressions for selected years with *First Market Capitalization* as the main explanatory variable

Panel A: Full sample[‡]

	Log(Total compensation 1)$_t$			Log(Total compensation 2)$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}$	0.0256	0.0259*	0.00158	0.0207	-0.00473	0.0104
	(0.99)	(2.02)	(0.12)	(0.86)	(-0.41)	(0.80)
Log(Market capitalization)$_{t-1}$	0.349***	0.456***	0.442***	0.345***	0.420***	0.408***
	(11.35)	(25.41)	(23.78)	(8.34)	(14.78)	(18.22)
(Market to book)$_{t-1}$	-0.0616	-0.0746**	-0.0793**	-0.0590	-0.0124	-0.123**
	(-1.61)	(-2.44)	(-2.71)	(-1.52)	(-0.34)	(-2.68)
(Stock return)$_t$	6.041***	3.519***	4.214***	5.614***	5.982***	8.973***
	(3.91)	(3.45)	(3.42)	(3.77)	(4.24)	(10.53)
(Stock return)$_{t-1}$	5.927**	2.434**	1.517	6.511**	5.148***	6.077***
	(2.97)	(2.39)	(1.36)	(2.85)	(5.58)	(4.63)
(Return on assets)$_t$	-1.376	-0.259	0.827	-0.162	1.219*	2.273**
	(-1.66)	(-0.43)	(0.85)	(-0.18)	(2.02)	(2.47)
(Return on assets)$_{t-1}$	1.146	0.0293	-0.0545	0.816	-1.640***	-0.719**
	(1.80)	(0.06)	(-0.07)	(1.38)	(-3.30)	(-2.60)
(Stock return volatility over 5 years)$_t$	5.872	7.619***	5.841***	0.980	7.683***	3.733
	(1.28)	(5.35)	(3.82)	(0.25)	(4.63)	(1.45)
Log(CEO tenure)$_t$	0.0374	0.00993	-0.0339	0.117***	0.0666**	0.116***
	(0.94)	(0.40)	(-0.75)	(3.72)	(2.58)	(3.34)
(External hire indicator)$_t$	0.0817	0.141**	0.0648	0.0661	0.0553	-0.0258
	(0.73)	(2.83)	(1.48)	(0.92)	(1.11)	(-0.48)
(CEO & Chairman indicator)$_t$	0.163***	0.152**	0.220***	0.0296	0.123*	0.220***
	(3.24)	(2.48)	(6.44)	(0.34)	(2.16)	(4.85)
MBA degree indicator	0.144***	0.0780	0.101*	0.0613	0.0942	0.0297
	(3.45)	(1.29)	(2.15)	(0.91)	(1.23)	(0.48)
Female indicator	-1.021***	0.0165	-0.0738	0.179	0.0184	-0.145
	(-9.39)	(0.10)	(-0.56)	(0.26)	(0.10)	(-0.85)
Constant	4.308***	4.085***	4.507***	3.956***	3.933***	4.079***
	(12.66)	(20.29)	(15.10)	(13.18)	(17.35)	(16.77)
No. of obs.	490	822	994	492	821	999
Adj. R^2	0.452	0.460	0.486	0.434	0.434	0.450
Year (t)	**1995**	**2000**	**2005**	**1995**	**2000**	**2005**

Panel B: Subsample 2[‡]

	Log(Total compensation 1)$_t$			Log(Total compensation 2)$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}$	0.00549	0.0642**	-0.00988	-0.0156	0.0111	-0.00110
	(0.23)	(3.16)	(-0.95)	(-0.35)	(0.46)	(-0.08)
No. of obs.	130	271	382	130	271	382
Adj. R^2	0.454	0.511	0.537	0.381	0.499	0.504
Year (t)	**1995**	**2000**	**2005**	**1995**	**2000**	**2005**

[‡] Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.

The table reports (selected) results from a robustness check with cross-section regressions for years 1995, 2000 and 2005. For each of the three years, the cross-sections were selected from the full sample (Panel A) and Subsample 2 (Panel B). The average age of individuals at the start of the first job in these cross sections is between 35 and 37 years. The average difference between the current date (1995/2000/2005) and the start date of the first job is between 17 and 19 years.
The dependent variables are log(TDC1) (columns 1-3) and log(TDC2) (columns 4-6). The explanatory variable of interest is *First Market Capitalization*. The remaining controls correspond to those used in our benchmark specifications in Table 2. For a more detailed description of the variables, see Table A2 in Appendix 2. For more detailed results from regressions in Panel B, see Table OA9 in Online Appendix 9.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics adjusting for clustering at the industry level (using the Fama-French 12 industry classification) are in parentheses.

Table 11: Weak-instrument robust estimation for IV regressions with *First Market Capitalization* as the instrumented variable
(Full sample‡)

Panel A: Regressions using a set of financial-markets-related excluded instruments

	Log(Total compensation 1)$_t$			**Log(Total compensation 2)$_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}^{\Delta}$	0.0113	-0.495***	-0.435***	0.196***	-0.564***	-0.483***
	(0.21)	(-4.01)	(-4.01)	(2.91)	(-4.05)	(-3.99)
Year dummies		yes	yes		yes	yes
Industry dummies			yes			yes
No. of obs.	11001	11001	11001	11066	11066	11066
Adj. R^2	0.470	-0.175	0.001	0.363	-0.182	0.009
LIML estimate of Log(Market capitalization)$_{t-k}^{\Delta}$	0.0092	-0.5554	-0.4731	0.1965	-0.5639	-0.4906
Conditional LR confidence set	[-0.1129,0.1287]	[-0.9705,-0.3383]	[-0.8065,-0.2842]	[0.0688,0.3467]	[-0.9638,-0.3418]	[-0.8299,-0.2896]
(p-val.)	(0.8748)	(0.0000)	(0.0000)	(0.0025)	(0.0000)	(0.0000)
Selected first-stage diagnostics						
F-statistics on excluded instruments	21.99	9.58	10.87	21.99	9.58	10.87
(p-val.)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Adj. R^2	0.265	0.270	0.278	0.265	0.270	0.278

Panel B: Regressions using a set of proxies for macroeconomic conditions as excluded instruments

	Log(Total compensation 1)$_t$			**Log(Total compensation 2)$_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}^{\Delta}$	-0.182***	-0.262***	-0.246***	0.0149	-0.0831	-0.0646
	(-3.22)	(-4.18)	(-4.09)	(0.25)	(-1.38)	(-1.10)
Year dummies		yes	yes		yes	yes
Industry dummies			yes			yes
No. of obs.	11001	11001	11001	11066	11066	11066
Adj. R^2	0.356	0.301	0.346	0.428	0.473	0.488
LIML estimate of Log(Market capitalization)$_{t-k}^{\Delta}$	-0.1854	-0.2745	-0.2521	0.0147	-0.0840	-0.0655
Conditional LR confidence set	[-0.3137,-0.0801]	[-0.4264,-0.1593]	[-0.3943,-0.1423]	[-0.1080,0.1369]	[-0.2132,0.0346]	[-0.1909,0.0517]
(p-val.)	(0.0004)	(0.0000)	(0.0000)	(0.8094)	(0.1642)	(0.2712)
Selected first-stage diagnostics						
F-statistics on excluded instruments	26.39	23.63	24.06	26.39	23.63	24.06
(p-val.)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Adj. R^2	0.266	0.273	0.280	0.266	0.273	0.280

Panel C: Regressions using a set of employment-related excluded instruments

	Log(Total compensation 1)$_t$			**Log(Total compensation 2)$_t$**		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Market capitalization)$_{t-k}^{\Delta}$	-0.235**	-0.277***	-0.267**	-0.153	-0.209**	-0.194*
	(-2.46)	(-2.74)	(-2.44)	(-1.53)	(-2.04)	(-1.73)
Year dummies		yes	yes		yes	yes
Industry dummies			yes			yes
No. of obs.	11001	11001	11001	11066	11066	11066
Adj. R^2	0.291	0.279	0.316	0.365	0.395	0.418
LIML estimate of Log(Market capitalization)$_{t-k}^{\Delta}$	-0.3093	-0.4022	-0.3172	-0.1601	-0.2214	-0.1959
Conditional LR confidence set	[-0.6477,-0.1125]	[-0.8441,-0.1817]	[-0.7114,-0.1078]	[-0.4176,0.0371]	[-0.5024,-0.02444]	[-0.5033,0.0186]
(p-val.)	(0.0013)	(0.0001)	(0.0021)	(0.1113)	(0.0275)	(0.0732)
Selected first-stage diagnostics						
F-statistics on excluded instruments	10.09	9.39	7.61	10.09	9.39	7.61
(p-val.)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Adj. R^2	0.262	0.270	0.277	0.262	0.270	0.277

‡: Table A1 in Appendix 1 summarizes the conditions applied to the full sample and subsamples.
$^{\Delta}$: instrumented variable

The table reports selected results from weak-instrument-robust IV estimation using the full sample and three different sets of excluded instrument. In Panel A, the exluded instruments are the S&P 500 volume change, the S&P 500 return and the S&P 500 volatility; in Panel B, these are the recession indicator, the investment-grade bond yield spread and the unemployment rate, and in Panel C, the employment rate, the employment growth rate and their interaction term. As before, we employ pooled 2SLS estimation (Columns 1 and 4), estimation with year dummies (Columns 2 and 5) and with year and industry dummies (Columns 3 and 6). The data does not support fixed effects 2SLS estimation. The dependent variables are log(TDC1) (Columns 1-3) and log(TDC2) (Columns 4-6). The instrumented variable is *First Market Capitalization*. The remaining controls (included instruments) correspond to our benchmark specification in Table 2. For a more detailed description of the variables, see Table A2 in Appendix 2. For more detailed results, see Table OA12 in Online Appendix 12.
The coeffcient estimate on *First Market Capitalization* due to normal approximation is reported in the first row of each panel. The bold-bordered sections of the panels contain the LIML estimates of the coefficient on *First Market Capitalization,* and the conditional likelihood ratio (CLR) confidence sets for the coeffcient estimates on *First Market Capitalization* according to Moreira (2003) and Mikusheva (2010) with the corresponding p-values. The validity of the latter estimation is conditional on *First Market Capitalization* being the only endogenous variable in the regression.
The bottom section of the table reports the basic first-stage diagnostics: F-test results for the joint significance of the excluded instruments and the first-stage adjusted R^2.
Statistical significance levels are indicated as follows: * p<0.10, ** p<0.05, *** p<0.01. Heteroskedasticity robust t-statistics are in parentheses.

Appendix 1

Table A1: Summary of conditions applied to the full sample and subsamples

Data	Max. no. of obs	**Conditions applied**			
		Non-financial firms	CEO present in firm for at least 3 years	Difference in years between	
				year of birth and start date of first job (age at career start)	current date and start date of first job
Pre-sample	13429	yes	no	any	any
Full sample	13378	yes	yes	any	any
Subsample 1	10111	yes	yes	any	≥ 10
Subsample 2	4710	yes	yes	≤ 30	≥ 10
Subsample CS	3048	yes	no	any	any
Subsample CS1	1990	yes	no	any	≥ 10

The table summarizes the conditions applied on the data. Throughout the paper we run regressions with three samples - the full sample, Subsample 1 and Subsample 2. Even in the full sample, several conditions are applied. Financial firms are excluded from the analysis. We also require the CEO to be present in the firm for at least three years. In Subsample 1, we require to follow the career of individuals in the sample for at least 10 years. The idea is to alliviate concerns that persistence in firm performance is driving the results.

Our individuals' first job is the first job that appears in the data and not necessarily the very first job of their careers. In Subsample 2 we thus add another condition to that applied in Subsample 1: individuals have to be no older than 30 years old when they start their first job. We attempt to capture the "real" beginning of our individuals careers. (If individuals start their careers in a public company, it is more likely that we have this data.)

Subsample CS refers to a cross section obtained from the pre-sample, i.e. the full sample *before* applying the conditon that the CEO be present in the firm for at least three years. For each individual, we select the observation with his first CEO year (the first CEO compensation).

Again, as in Subsample 1, to alliviate concerns that persistence in firm performance is driving the results in Subsample CS, we require the period between the current date and the start date to be at least 10 years, and obtain Subsample CS1.

Appendix 2

Table A2: Variable definitions

Panel A: Response variables, main explanatory variables, firm-level controls

	Variable	Source	Data item identification in Source and operational measure (if applicable)	Definition
Dependent variables	CEO Compensation - Total compensation 1 • current (t), lagged (t-1) • first (t-k)	Compustat-Execucomp	Total Compensation [TDC1], in $ thousands	This compensation measure comprises Salary, Bonus, Other Annual, Total Value of Restricted Stock Granted, Total Value of Stock Options Granted (using Black-Scholes), Long-Term Incentive Payouts, and All Other Total. In our analysis compensation is only considered after the individuals become CEOs; we do not control for pre-CEO compensation in any of the regressions.
	CEO Compensation - Total compensation 2 • current (t), lagged (t-1) • first (t-k)	Compustat-Execucomp	Total Compensation [TDC2], in $ thousands	This compensation measure comprises all items listed for TDC1 plus the Net Value of Stock Options Exercised. We only consider CEO compensation in our regressions; we do not control for pre-CEO compensation in any of the regressions.
Main explanatory variables/ Firm-level controls	Market capitalization • current (t), lagged (t-1) • first (t-k)	Compustat	Common Shares Outstanding [CSHO, in millions] x Price Close - Annual - Fiscal [PRCC_F, in $], measured in $ millions	The market value of equity as a measure of firm size; we distinguish between the current/lagged market capitalization of the company for which the indivdual works as the CEO, and "first" market capitalization, i.e. the market capitalization of the individuals' first employer company, as a measure of initial placement success.
	Total assets • current (t), lagged (t-1) • first (t-k)	Compustat	Assets - Total [AT, in $ millions]	The total value of assets reported on the Balance Sheet, a measure of firm size. We distinguish between current/lagged total assets of the company for which the individual works as the CEO, and "first" total asset, i.e. the total assets of the individuals' first employer company, as a measure of initial placement success.
	Top ten *indicator*	Compustat (firm id through GVKEY)		A binary variable that equals one if the individual's first employer is one of the following companies: Arthur Andersen, AT&T, DuPont, Ford, General Electric, General Motors, IBM, McKinsey, Procter&Gamble, Texas Instruments. This definition is adopted from Schoar and Zuo (2012), p. 9.
	No. of employees - first (t-k)	Compustat	Number of Employees [EMP, in thousands]	The number of company workers as reported to shareholders; we do not report results for regressions with this alternative measure of firm size, we use it only to better describe the intitial job conditions of future CEOs.
	Sales - first (t-k)	Compustat	Sales/Turnover (Net) [SALE], in $ millions	Gross sales reduced by items such as discounts or customer credit; we do not report results for regressions with this alternative measure of firm size, we use it only to better describe the intitial job conditions of future CEOs.
Firm-level controls	Market to book - lagged (t-1)	Compustat	{(Common Shares Outstanding [CSHO, in millions]) x (Price Close - Annual - Fiscal [PRCC_F, in $]) + (Assets - Total [AT, in $ millions]) - (Common/Ordinary Equity - Total [CEQ, millions])}/(Assets - Total [AT, in $ millions])	The market value of assets over the book value of assets, a firm-level control in our compensation regressions
	Stock return • current (t) • lagged (t-1)	CRSP	Holding Period Return [RET from CRSP Monthly Stock], annualized	Stock returns incl. dividends
	Return on assets • current (t) • lagged (t-1)	Compustat	Earnings Before Interest [EBITDA, in $ millions]$_{(t)}$ / (Assets - Total [AT, in $ millions])$_{(t-1)}$	A measure of company profitability relative to its total assets
	(Stock return volatility over 5 years) - current (t)	CRSP		Standard deviations of stock returns over 5-year rolling windows (from t-4 to t)

(continued)

Table A2 ***(continued)***

Panel B: CEO-level controls, excluded instruments

	Variable	Source	Data item identification in Source and operational measure (if applicable)	Definition
CEO-level controls	(CEO tenure)$_t$	BoardEx/ Compustat-Execucomp	[in months]	The number of months during which the individual held the office of CEO in the company
	(External hire *indicator*)$_t$	BoardEx/ Compustat-Execucomp		A binary variable that equals one if the CEO was hired coming from another company (as identified by GVKEY), thus excluding cases of internal promotion
	(CEO & Chairman *indicator*)$_t$	BoardEx/ Compustat-Execucomp		A binary variable that equals one if the CEO is at the same time the Chairman of the Board of Directors, zero otherwise; a proxy for CEO power
	MBA degree *indicator*	BoardEx		A binary variable that equals one if the CEO holds an MBA degree, zero otherwise; although individuals may obtian the degree well into their careers, we consider this a time invariant variable
	Female *indicator*	BoardEx/ Compustat-Execucomp		A binary variable that equals one if the CEO is a female, zero otherwise
Excluded instruments	(Recession *indicator*)$_{t-k}$	National Bureau for Economic Research (NBER)		A binary variable that equals one if the period (month and year) when the individual started his/her first job is identified by NBER as *recession* or *through*, zero otherwise, i.e. if the period is identified as *expansion* or *peak*
	(Recession year *indicator*)$_{t-k}$°	National Bureau for Economic Research		A binary variable used in Schoar and Zuo (2012) that equals one if the year in which the individual started his/her first job does not include the peak of a business cycle, zero otherwise
	(US unemployment rate, 12-month average)$_{t-k}$	U.S. Bureau for Labor Statistics	[%]	The average annual US unemployment rate for the one year period preceeding the time (month and year) when the individual started his/her first job or graduated
	(Investment-grade bond yield spread)$_{t-k}$	Federal Reserve	[%]	The difference between the highest and lowest quality investment-grade bond yield at the time (month and year) when the individual started his/her first job or graduated
	(S&P 500 volume, 1-year change)$_{t-k}$	CRSP	[%]	The volume change in the S&P 500 index for the one year period preceeding the time when the individual started his/her first job or graduated
	(S&P 500 average return over 1 year)$_{t-k}$	CRSP	[%]	The annualized return on the S&P 500 index for the one-year period preceeding the time (month and year) when the individual started his/her first job or graduated
	(S&P 500 st. deviation over 2 years)$_{t-k}$	CRSP	[%]	The annualized standard deviation of the S&P 500 index for the two-year period preceeding the time (month and year) when the individual started his/her first job or graduated
	(US employment rate, 12-month average)$_{t-k}$	U.S. Bureau for Labor Statistics	[%]	The average annual US employment rate (= 1 - unemployment rate) for the year when the individual started his/her first job or graduated
	(US employment annual growth rate)$_{t-k}$	U.S. Bureau for Labor Statistics	[%]	The change in the US employment rate for during the one year period preceeding the time when the individual started his/her first job or graduated

The table provides an overview of all variables in our dataset, their sources, their definitions or operational measures if applicable.