Industry Conditions and CEO Labor Markets: New Evidence on Relative Performance Evaluation

C. Edward Fee
Tulane University
cfee@tulane.edu

Charles J. Hadlock
Michigan State University
hadlock@msu.edu

Jing Huang
Ernst & Young
Jing.huang@ey.com

Joshua R. Pierce
University of Kentucky
joshua.pierce@uky.edu

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Abstract

We study the role of industry conditions in the internal and external labor market for CEOs in a sample of over 60,000 firm-years from 1990-2007. Future job prospects of CEOs who separate from an employer are dependent on relative-to-industry stock performance, but not on industry stock performance, suggesting that new employers filter out industry stock returns in their evaluation of managerial talent. In the case of CEO turnover, we do not detect an independent role for industry stock returns in predicting turnover. This evidence suggests that a simple learning view of turnover with full relative performance evaluation and efficient information filtering is a reasonable description of CEO job allocation decisions with respect to stock returns. In the case of accounting measures of performance, we find a lack of full relative performance evaluation. Poorer industry accounting performance is associated with elevated rates of CEO turnover, an enhanced likelihood of hiring a firm outsider as a replacement, and, in some isolated models, poorer labor market prospects for a dismissed CEO. These accounting results are consistent with optimal job matching considerations.

JEL Classification: G30; G31; G32
Keywords: CEO hiring; CEO turnover; performance measurement; relative performance evaluation; industry performance

1. Introduction

How do firms select executives who are optimally positioned to lead their organization? What is the equilibrium allocation of managerial skills and abilities across firms? How are these skills and abilities developed and identified? Clearly these are important issues if we seek to understand the role of top managers on firm performance and corporate policies, and also the underlying incentives of these key decision makers.

Several recent papers emphasize the role of an employer's *industry* in the decision to retain or select a given individual as a firm's CEO. In an interesting study, Jenter and Kanaan (2013) find that CEO dismissal decisions are closely related to industry stock performance. Complementing this evidence, Eisfeldt and Kuhnen (2013) show that industry performance plays an important role in the types of CEO replacements that are hired by firms. This recent research casts doubt on a simple learning view in which hiring and firing decisions are entirely determined by inferences regarding a simple notion of managerial ability. Under the learning view, job allocation decisions are primarily based on relative performance evaluation (RPE), with industry components of firm performance filtered out by firms during the ability inference process (see Holmström (1982) and Gibbon and Murphy (1990)).

While the recent literature casts doubt on a simple version of the RPE hypothesis in the context of CEO firing and hiring, the extent to which this hypothesis fails to explain firm behavior and the reasons/efficiency implications underlying this failure are far from resolved. In this paper we attempt to make progress on this issue. To do so, we first conduct an entirely new set of tests that we argue offer insight on the role of industry conditions in the evaluation of managerial talent. We then revisit and extend some of the recent empirical models of CEO firing and hiring to present a more complete picture of the role of industry conditions in job allocation decisions. We conduct our analysis on a large, rich, and comprehensive sample, allowing us to nest many prior empirical models that examine this set of issues.

The new tests we present consider the subsequent labor market opportunities of dismissed CEOs. We reason that if prior employers inefficiently attribute industry-driven components of firm performance to a CEO's abilities, then executives who are dismissed at times of relatively poor (strong) industry performance should be relatively more (less) attractive to new employers, ceteris paribus. This prediction depends on the presence of new employers who understand the performance attribution errors of prior employers. If new employers also inefficiently attribute industry-driven performance factors to dismissed CEOs, they will tend to avoid (seek) executives who were dismissed at a time of poor (strong) industry performance.

When we turn to the data, we find no evidence indicating that executives who are dismissed at times of poor *industry stock performance* fare particularly poorly or particularly well in terms of their subsequent external labor market outcomes. This evidence casts substantial doubt on the notion that there is a pool of inefficiently dismissed executives who are either avoided because of similar inference mistakes by new employers, or sought after by new employers seeking to take advantage of inference errors made by prior employers. The evidence is, however, consistent with efficient filtering of industry stock return factors in dismissal decisions.

We do uncover some limited evidence that executives who are dismissed at times of strong *industry accounting performance* fare relatively well in the subsequent labor market. However, in all models in which we detect this relation, we find an insignificant role for firm accounting performance in job opportunities. This evidence, coupled with no evident parallel behavior with respect to industry stock returns, suggests to us that industry accounting performance is likely related to the presence or development of desirable managerial skills. Certainly, viewing all of the evidence together, it appears highly unlikely that there are widespread performance attribution errors by both new and old employers that are present only on the accounting dimension.

Our evidence from external labor markets casts doubt on behavioral explanations for any lack of RPE in turnover and points us in the direction of efficiency-based skill stories for any industry performance effect on CEO turnover. However, before attempting to sort out potential explanations along these lines, it is worth emphasizing that the prior evidence on industry factors in CEO turnover includes a fairly mixed set of results depending on time period, sample selection, variable definitions, and other modeling choices. In particular, early evidence largely supports the RPE hypothesis with regard to filtering out industry stock returns (e.g., Gibbons and Murphy (1990), Barro and Barro (1990)), while more recent studies largely reject strong versions of the RPE theory (e.g., Jenter and Kanaan (2013), Kaplan and Minton (2012)). Given the rich data at our disposal coupled with our new evidence, we attempt to provide a more comprehensive picture of the role of industry factors in the allocation of managerial talent by revisiting CEO turnover models.

When we examine the role of industry performance in CEO turnover, we find that firms generally do fully filter out industry stock returns in turnover decisions. This evidence casts doubt on the generality of some recent findings to the contrary, and it suggests that the role of industry factors in turnover may be fairly limited. In an effort to reconcile our findings with other evidence on this issue, we present evidence that common tests for the presence/absence of RPE can be quite sensitive to slight modeling perturbations. In fact, using simulations, we are able to demonstrate that even when turnover data is mechanically constructed to display a certain version of strong RPE, tests that assume a different functional form for the RPE relationship can spuriously indicate a lack of RPE. It appears that these surprising findings are largely driven by the nonlinearity underlying models of turnover decisions. We offer some methodological guidance to future researchers estimating these types of models.

We do find that industry accounting performance plays a significant role in turnover decisions. In particular, holding constant a firm's relative-to-industry accounting performance,

we find that turnover probabilities are elevated for firms in industries with poor accounting performance. Thus, we conclude that there is less-than-full RPE in turnover decisions, but for accounting, rather than market, performance metrics. Thus, a modified version of the interesting empirical puzzle highlighted by Jenter and Kanaan (2013) and others still remains.

One possible efficiency-based explanation that is consistent with the turnover evidence is the possibility that the optimal set of managerial skills changes with industry performance as measured by accounting metrics. In particular, the type of executive best suited to lead a firm may be more likely to change after negative industry cash flow shocks. Along these lines, Eisfeldt and Kuhnen (2013) present an elegant equilibrium model of the covariance between desired managerial skills and industry performance along with some related empirical evidence. We undertake an empirical analysis that is similar in spirit, but is intended to be exploratory in nature in an effort to describe the role of industry conditions in the allocation of talent across firms.

Interestingly, we find that the propensity to hire firm outsiders as replacement CEOs is elevated when industry performance is poor. This effect is present for both stock and accounting performance, but the economic and statistical significance of this relation is substantially larger for accounting measures. Thus, it does appear that industry difficulties tend to spur firms to make more significant managerial changes in the form of hiring a firm outsider. This is consistent with the general notion that the set of desired managerial skills or experiences has an industry component.

Conditional on hiring a firm outsider, we find weak evidence hinting that firms in poorly performing industries are more likely to choose a CEO from within the industry. Thus, the net effect of industry performance on the reallocation of managerial talent across industries after turnover appears to be negligible. Rather, it appears that there is a reshuffling of managers within an industry when an industry is performing poorly. Taken as a whole, these findings on

replacement decisions are consistent with the notion that the allocation of managerial talent across firms has an industry component. However, the empirical picture is fairly nuanced, and we are unaware of any single model that simultaneously can explain the entire empirical picture. Certainly Eisfeldt and Kuhnen (2013) model is a promising start in this direction.

Collecting all of this related evidence, several important points emerge. First, our evidence casts doubt on the notion of the presence of inefficiencies in the CEO turnover process arising from ability inference errors associated with industry performance. Second, our findings suggest that a relatively simple learning perspective with full industry RPE is a reasonable description of the CEO turnover process with respect to stock return measures of performance. Third, industry conditions as measured by accounting profitability do appear to affect the CEO retention decision, and, to a very limited extent, the labor market opportunities of a dismissed executive. This is likely for reasons related to efficiency and optimal matching of managerial traits to firms. Fourth, industry conditions do appear to be related to the decision of who to hire conditional on a turnover event, with poorer industry conditions generally being associated with an increased rate of the shuffling of top management talent within an industry. Finally, we make some important methodological observations regarding empirical models of CEO job allocation decision.

The rest of the paper is organized as follows. In section 2, we discuss the related literature and motivate our empirical investigation. In section 3, we discuss our data collection and basic properties of the sample. In section 4, we present our external labor market results concerning the job prospects of CEOs who separate from their employer. Section 5 reports results on internal labor markets and the CEO turnover mechanism, while section 6 examines the CEO replacement choice. Section 7 offers concluding thoughts.

2. Background and Motivation

2.1 Relative performance evaluation and CEO turnover

Following Holmström (1982), the theoretical literature on RPE posits that managers should be evaluated based on metrics that filter out components of performance that arise from factors unrelated to managerial effort or ability. This theory has been examined in the context of executive compensation, where the usual goal of the incentive scheme is to elicit managerial effort. RPE theory has also been exploited in the context of employment decisions, where authors often assume that firms learn over time about managerial abilities and/or the quality of a manager-firm match from performance signals (e.g., Gibbons and Murphy (1990)). Executives are then dismissed when the inferred ability level or match quality falls below some threshold.

In the related empirical literature, many authors implicitly assume the presence of full RPE by constructing performance metrics that remove industry or market factors. This approach is common in research on CEO turnover, with dismissal decisions often modeled as a function of relative-to-benchmark performance (e.g., Coughlan and Schmidt (1985), Weisbach (1988), and Warner, Watts, and Wruck (1988), Huson, Parrino, and Starks (2001)). Rather than assuming full RPE, Gibbons and Murphy (1990) directly examine the degree to which industry performance components are filtered out of firm performance metrics in CEO compensation policies and turnover decisions. While they detect less than full RPE for compensation policies, they report full filtering of industry/market stock returns in CEO turnover decisions.[1] Similar results on CEO turnover are reported by Barro and Barro (1990) and Garvey and Milbourn (2006).

In an examination of the relative roles of stock versus accounting performance in CEO turnover, Engel, Hayes, and Wang (2003) discuss in passing the issue of whether industry performance is fully filtered out of stock and accounting returns when firms make turnover

[1] For additional studies of the lack of RPE in CEO compensation, see Aggarwal and Samwick (1999a), Bertrand and Mullainathan (2001) and Garvey and Milbourn (2003, 2006).

decisions. They report full RPE in the case of stock returns, but less than full RPE in the case of accounting metrics. While they do not explore or tabulate these results, they are worth noting as our analysis is generally consistent with their observations.

In contrast to these earlier studies, a more recent literature casts doubt on the RPE hypothesis with respect to CEO turnover. Of particular note, Jenter and Kanaan (2013) present substantial evidence indicating that CEO dismissals are in fact affected by industry stock returns, with poor industry performance resulting in an enhanced likelihood of turnover. Similar findings have been reported by Bushman, Dai, and Wang (2010), Gopalan, Milbourn, and Song (2010), Kaplan and Minton (2012), and Eisfeldt and Kuhnen (2013). These findings are particularly puzzling, as they suggest the possibility that CEOs are inefficiently dismissed (blamed for bad luck) or retained (credited for good luck). Given the importance of the CEO, any such inefficiency could have substantive implications for our understanding of firm performance and policy choices.

2.2 Unresolved questions

The literature described above raises some important questions. Most notably, to the extent that there is a lack of full RPE and a rejection of the simple learning model for some industry performance metrics, the reasons for this failure are unclear. One possibility, mentioned above, is that CEO turnover decisions may at times be inefficient. This possibility could arise if boards make ability inference mistakes (see Jenter and Kanaan (2013)), or if they use CEOs as scapegoats to appease unhappy investors (see Khanna and Poulsen (1995)). Alternatively, a lack of RPE with respect to some industry performance metrics may indicate that

the set of desired managerial skills/styles/backgrounds varies with industry conditions.[2] This possibility has some intuitive appeal, and an ambitious optimal matching model along these lines that is consistent with several aspects of the data is presented by Eisfeldt and Kuhnen (2013).[3]

A second important unresolved issue is the exact extent to which there is a lack of full RPE and a failure of simple learning models to explain observed CEO turnover. As discussed above, there is a wide variation in results across studies that depend on a host of important modeling choices and also, in some cases, on the way in which industry performance is measured (e.g., stock versus accounting performance). Sorting out this issue requires a large and comprehensive sample so that prior modeling approaches and tests can be examined and nested within a unified framework.

If full RPE is present for some subsamples or performance measures, these settings can be viewed as ones in which the learning view is a reasonable description of the turnover process. The settings in which RPE fails to adequately describe turnover behavior may then reveal clues as to the time-varying industry factors that govern the allocation of top management talent across firms. This in turn can lead to a direct examination of the role of these factors in the matching of managerial characteristics to firms.

The goal of our analysis is to make progress on the aforementioned distinct, but closely related, issues. In our view, these are important questions for several reasons. First, understanding the role of industry factors in turnover and job allocation decisions has implications for the incentives of CEOs and those near the top of the corporate hierarchy who

[2] Gopalan, Milbourn, and Song (2010) present an interesting theory that suggests that both compensation and turnover may exhibit a lack of full RPE in order to incentivize CEOs to optimally choose a firm's sector exposure level.

[3] Eisfeldt and Kuhnen (2013) distinguish their approach from a learning perspective. In our view, the approaches are related, with ability being reinterpreted as the value of a specific skill set to a given firm at a particular point in time. Eisfeldt and Kuhnen (2013) make the important point that both absolute and relative performance may contain information on the time-varying value of different skill sets.

aspire to these positions. Second, given the prominent role of the CEO in corporate decisions and profitability, the issue of the efficiency of CEO turnover and job allocation decisions may have first order implications for understanding corporate efficiency. Finally, understanding the time variation in desired managerial skills may provide us with a lens into optimal firm-manager matches and associated issues regarding time variation in corporate decisions, performance, product market behavior, and compensation policies.

2.3 New tests: External labor markets

The external labor market for dismissed executives, in addition to being of independent interest, may provide an important source of information relevant for understanding performance evaluation in the internal labor market (i.e., CEO turnover decisions). If prior employers inefficiently blame or credit executives for industry factors beyond their control, then executives who are dismissed at times of relatively poor (strong) industry performance should be relatively more (less) talented than other dismissed executives, ceteris paribus.

Under this inefficiency scenario, two distinct possibilities in the external labor market emerge. If a potential new employer understands the biases in the removal decisions of old employers, this firm will find candidates who were dismissed at times of poor industry conditions to be particularly attractive. If there is a substantial probability mass of firms adopting this cherry picking behavior, the job prospects of dismissed executives should exhibit a *negative* relationship with industry performance at the prior employer.[4]

[4] Presumably, firms use a set of public and private signals regarding both general and firm-specific abilities when updating their beliefs to make dismissal decisions. If an executive is inefficiently blamed (credited) for bad luck (good luck), the threshold level of inferred ability to avoid dismissal based on all other relevant signals will be relatively high (low) for bad luck (good luck) executives. These observations can be easily formalized and lead to our prediction regarding variation in the ability levels of dismissed executives. Canella, Fraser, and Lee (1995) present some evidence on labor market ability inferences regarding dismissed CEOs in the banking industry.

An alternative possibility is that most (or all) new potential employers have the same biases as old employers in their inferences regarding managerial ability in the presence of industry luck factors. In this case, poor industry performance reflects poorly on a dismissed executive's (incorrectly) perceived abilities, holding relative-to-industry performance constant. Consequently, new employers will find these candidates less attractive and we should observe a *positive* relationship between job prospects and industry performance at the prior employer.[5]

Given the preceding logic, in our empirical analysis we examine the relation between industry performance and the subsequent labor market outcomes of dismissed executives. Any type of robust relation would support the inefficient blaming/crediting scenarios discussed above. A lack of any such relation would be consistent with the optimal filtering of industry factors by prior employers when making ability inferences.

2.4 Prior tests revisited and extended: CEO turnover and replacement

As discussed above, the prior literature on RPE in CEO turnover presents a somewhat cloudy picture. This is not completely surprising, as studies vary along several important dimensions including the time periods studied, the types of firms studied, the definitions of forced turnover, the types of performance measures studied, and the construction of firm and industry performance measure variables. To fully understand the extent of deviations from full RPE and to gain insights on what may cause these deviations, it is necessary to explore the role of these choices on model inferences. This is only feasible in a large, comprehensive, and rich sample in which many prior approaches can be nested and empirical modeling choices perturbed

[5] Potential new employers should condition their inferences on all available public signals, including the fact that a dismissal/job separation occurred. The directional role of industry performance factors in these inferences should continue to hold fairly generally, even with this conditioning. For brevity, we omit a formal model.

along various potentially relevant dimensions. In our empirical analysis we identify the specific differences across studies that motivate our model perturbations.

One explanation for a lack of pure RPE in some settings is the possibility that the desired type of manager (e.g., skills, background, style, etc.) may change with industry conditions.[6] While it can be difficult to measure desired managerial traits directly, the presence of an industry performance factor in turnover suggests that the industry background of potential replacement managers may be a component in the hiring decision. Eisfeldt and Kuhnen (2013) present an equilibrium model that makes some specific predictions along these lines. While our analysis is more exploratory in nature, we consider some similar empirical issues. In particular, we examine the role of industry conditions in the decision to hire a firm and/or industry outsider. Any detectable systematic relation would provide indirect evidence for the hypothesis that the demand for certain managerial traits/skills has an important industry performance component.

3. Sample and Data

3.1 Initial sample selection

We start with all Compustat firms from 1990 to 2007 with the exception of utilities, financial firms, foreign firms, and firms with under $10 million in assets (in 1990 dollars). We identify the CEO of every firm at the start of each fiscal year by using the listing of the firm's top four executives in the name file of the Compustat PCPlus/Research Insight CDs. We clean this data and sort out the timing of CEO changes using SEC filings and news searches. This process results in a sample of 61,164 firm-years in which we know the identity of the CEO at the start and end of the fiscal year. This is a large, diverse, and comprehensive sample compared to prior studies.

[6] For related evidence on the movement of executive talent across firms, see Hayes and Schaefer (1999), Bertrand and Schoar (2003), and Fee, Hadlock, and Pierce (2013).

As is well known, it is often difficult to determine the identity of the party initiating a CEO change and the true reason(s) for the event. Given the coveted nature of the CEO post and the associated high compensation, we suspect that most CEO turnover is involuntary and represents a negative outcome for an executive, except in cases when the individual is either near retirement age or leaves to immediately take a prestigious position elsewhere. Certainly much of the prior empirical literature on the turnover-performance relation is consistent with this assumption. However, rather than take a strong stand on this issue, we consider multiple definitions of turnover which will vary in their levels of type 1 and type 2 error.

Our first definition, referred to as generic turnover, includes all CEO changes with the exception of health and death related events. As we report in Table 1, there are 6,877 such events representing a turnover rate of 11.24%. Generic turnover can be viewed as a liberal categorization of dismissals.

At the other extreme, we consider a categorization that requires direct evidence of a forced dismissal. In particular, we search all articles in Factiva in a 3-year window around the change for any mention of the outgoing CEO's name accompanied by keywords suggesting a forced departure (e.g., "forced," "fired," "under pressure," "ousted," etc.). We uncover 533 such events, representing an overtly forced turnover rate of 0.87%. The low rate of overtly forced departures is likely to reflect incomplete press coverage of turnover events, particularly in the case of smaller firms. There may also be systematic biases in press reports that could lead to spurious conclusions. In particular, if the press does not fully understand RPE, they may have a tendency to incorrectly label turnover events as forced based on absolute performance, even when firms are relying on relative performance in their decisions.

Given these concerns, we create another relatively conservative categorization of dismissal events that should not suffer from any press reporting bias. This categorization

borrows from Fee and Hadlock (2004) by exploiting information on severance payments. In particular, for each event we search through the firm's proxy statements for any words related to a severance, consulting, or non-compete agreement and code a departure as a severance departure if the evidence suggests a non-trivial separation payment to the departing CEO. Since proxy statements are missing for many of the smaller firms in our sample, and also for most pre-1992 observations, in this severance coding we restrict attention to firms in the S&P 1500 in the period starting after 1992.

We uncover 630 severance related departures in the examined subsample of 13,869 firm-years. This represents a severance departure turnover rate of 4.54%, an order of magnitude greater than the 0.87% overtly forced turnover rate derived from news articles. This indicates that recent turnover studies that focus on overtly forced events may be missing a large fraction of the outcomes of interest. Consistent with our suspicion, it appears that a large fraction of generic CEO turnover events are not voluntary.

3.2 Hiring outcomes

To characterize external labor market outcomes after turnover, we identify all cases in which a departed CEO's name reappears in the name file of the top 4 executives at any Compustat listed firm (including financial firms/utilities/firms below $10 million in assets/etc.) over the sample period. We use computer algorithms to generate an initial list of possible new positions. We then hand check all identified potential matches using SEC filings, Factiva news searches, and Compact Disclosure CDs.

As we report in Table 1, of the 6,877 CEO turnover events in our sample, we find that 326 of these individuals (4.74%) resurface as top 4 executives at another sample Compustat firm within 4 years of their departure date. Most of these (258) are cases in which the individual obtains a CEO position elsewhere. A small number (56 of 326) of these new opportunities

represent moves from one firm to another within a month of the departure ("jumps"), with the remainder representing new employment after a non-trivial intervening period without an executive position at a public firm ("retreads"). The external labor market tests we outline earlier are focused primarily on examining the market for these retreads. The figures in Table 1 clearly indicate that younger departed CEOs are more likely to resurface than are older CEOs, but even for the youngest age cohort (age < 55) resurfacing rates are relatively low (7.60%).

These summary statistics are, in and of themselves, quite informative. First, the generally low rate of resurfacing as a top executive of another public firm suggests that dismissed CEOs tend to fare rather poorly in the executive labor market relative to their prior position. While many older executives may voluntarily retire and thus not look for new positions, the fact that the resurfacing rate for even the youngest executives is low provides fairly compelling evidence for this assertion. While we do not have complete data on each individual's compensation, we can predict compensation from a regression model using Execucomp data. Using this approach, the median imputed ratio of new compensation to old compensation for retreads is .72. This indicates that even the relatively good post-turnover labor market outcomes we identify tend to represent a relative step down from the executive's prior position.

Certainly the new positions we identify are not an exhaustive list of all destinations for departed CEOs. However, given that we can identify the universe of very elite (top 4) positions at almost all large public firms, we are confident that we identify a large portion of the best outcomes for CEOs who separate from their employer. For the purposes of our external labor market tests, all we need is a systematic way to measure this market's inferences regarding a manager's talents. The procedure we employ of identifying all positions within a relatively elite set would appear to accomplish this goal.

To gauge other external labor market outcomes for departed CEOs, we undertake a small pilot examination. In particular, we conduct an exhaustive news/web/financial filings search of

the career outcomes of a random set of 200 departed CEOs under the age of 60 for a five year period following their departure. Casting this wider net, we are able to find evidence of some type of new position for a respectable 31.0% of these departed CEOs. This rate is much higher than the 7.6% resurfacing rate reported above for younger executives at top 4 positions of Compustat firms. Thus, clearly many dismissed CEOs do seek (and obtain) new employment, with only a minority these being very elite positions at other public firms.

While it is difficult to succinctly characterize all of the new positions identified in the pilot examination, many of the positions are at relatively small private operating firms, non-profit firms, government positions, consulting positions, senior positions at public firms that are too small to be listed on Compustat, and relatively more junior positions at other public firms. Only four individuals resurface at well-known private firms (private equity, venture capital, consulting, hedge funds, or private operating companies). Thus, we are confident that our search for senior positions at other public firms detects the vast majority of the relatively better labor market outcomes for retread CEOs. It is the cross-sectional variation in the determination of who gets these positions that provides the basis for our empirical tests below.

4. External Labor Market Prospects after Turnover

4.1 Performance measurement

The literature suggests a host of possible ways of measuring firm performance that may be informative for the purposes of evaluating CEO talent. We first select a preferred baseline set of measures and discuss alternatives in our robustness checks. Our first measure is derived from a firm's continuously compounded stock return (i.e., log of 1+ return) in the 3-year period ending at the start of the fiscal year in which the CEO turnover event occurs. The continuous compounding diminishes the effect of outliers and transforms the data into a distribution that more closely resembles the Gaussian distribution that underlies much of the related theoretical

literature on learning. As we would expect, the figures in Panel A of Table 2 reveal that the stock return performance of the prior employer of departed CEOs is on average substantially below the corresponding industry figures. Industry return is calculated as the continuously compounded 36 month return (i.e., log 1 + industry return) of the equally-weighted portfolio of other firms in the same Fama-French industry.[7]

As an alternative performance measure, we borrow from Aggarwal and Samwick (1999b) and convert 36-month return figures into a uniform distribution by assigning each return into a percentile rank within its industry-year cohort. As we report in Panel A of Table 2, the median percentile ranking of this version of 3-year stock performance for firms with CEO turnover is .41 (i.e., at the industry 41st percentile). This again confirms that recent market performance for firms with turnover is substantially below the industry median.

Accounting metrics may also play a substantive role in managerial performance evaluation and turnover (see Weisbach (1988), Engel, Hayes, and Wang (2003), and Eisfeldt and Kuhnen (2013)). Thus, we also consider a firm's return-on-assets (ROA) and a percentile version of ROA in subsequent labor market opportunities. The summary statistics in Table 2 confirm that the recent accounting performance of firms with CEO turnover is typically below the corresponding industry benchmark. In some of our analysis, we will consider the role of changes in ROA rather than its level, since changes may also contain relevant information.

4.2 Univariate evidence on labor market outcomes

To examine the relation between performance at the prior employer and subsequent job outcomes, we divide the sample of departed CEOs under the age of 60 into firm performance

[7] Prior authors use a variety of definitions of industry returns including different weighting, rebalancing, and compounding schemes. Firm-level stock returns and accounting returns are winsorized at the 1% and 99% tails throughout our analysis. In cases below in which we industry adjust performance using a linear regression, we winsorize before estimating the regression.

quartiles and calculate new position resurfacing rates. As we report in Panel B of Table 2, these rates are higher for executives in the highest relative-to-industry performance quartile compared to the lowest, with a difference that is significant at the 5% level (not quite significant) using the stock-return (accounting) performance metric. This evidence is consistent with Fee and Hadlock (2003) and suggests that relative-to-industry firm performance at the prior employer, particularly as measured by stock returns, contains useful information that is relied on by the external labor market in its assessment of managerial ability.

We next calculate resurfacing rates by industry performance quartile of the prior employer, with quartile breakpoints calculated over each annual sample cohort. Interestingly, as we report in Table 2, no obvious pattern emerges here. Resurfacing rates for the worst and best industry quartiles are remarkably similar, and there is no monotonic pattern moving across quartiles. This preliminary evidence suggests that the external labor market does not blame or reward a given executive for industry performance, a factor which is presumably outside of the individual's control. This is exactly what we would expect if dismissal decisions are efficient with respect to reliance on industry information for ability inferences. We will further explore this important initial finding in our multivariate analysis below.

Job jumpers often move up in the labor market and inferences regarding their abilities are not affected by a dismissal decision. Thus, we might expect to observe meaningful differences in the marginal role of performance metrics for jumpers versus resurfaced retreads. While the jumpers do display higher average levels of performance, the roles of both relative-to-industry performance and industry performance in predicting jumps and retread positions is similar. In particular, as we report in Panel B of Table 2, the rates of both jumping and getting hired as a retread appear to increase with relative-to-industry performance, but not with industry performance. Since the samples are smaller, some of the comparisons across performance

quartiles become less significant. The figures again show no evidence of a relation between industry performance and the likelihood of a relatively positive external labor market outcome.

4.3 Multivariate modeling of external labor market outcomes

While the univariate evidence is suggestive, it is important to control for other non-performance factors that may affect external labor market outcomes. Thus, we estimate logit models in which the dependent variable assumes a value of one if a departed executive obtains a new position and a zero otherwise. We include in these models performance variables plus a set of controls including CEO age, an age greater than 60 dummy variable, tenure, year dummies, and the log of inflation-adjusted assets of the prior employer. In each model we select a single type of performance metric (stock or accounting performance, raw or percentile version) and include in the estimated model the selected variable measuring relative-to-industry performance and the corresponding variable measuring industry performance. Following Jenter and Kanaan (2013), in the case of raw stock and accounting performance, we measure relative-to-industry performance as the residual from a regression of firm performance against industry performance, with industry performance set equal to the predicted return from this regression.[8]

We report the resulting estimates on the performance coefficients from these models in Panels A1 and A2 of Table 3. Each pair of performance coefficients (i.e., the relative-to-industry coefficient in Panel A1 and corresponding industry coefficient in Panel A2) is derived from a separate logit model estimation. In Column 1, we report results for models where the dependent variable assumes a value of 1 for any type of external job movement (i.e., both jumps and retreads). As we report in Panel A1, the coefficient on both the raw and percentile versions of

[8] The coefficient on the industry performance variable in these regressions is in most cases less than 1. The main results Tables 3 and 5 are substantively unchanged if we assume a coefficient of 1 on industry performance and thus measure relative-to-industry performance as firm performance minus industry performance. We regression-adjust the change in ROA variable by regressing the change in a firm's (winsorized) ROA against the industry median change in ROA. Firm (industry) performance is then taken to be the residual (predicted value).

relative-to-industry stock performance are both positive and significant (10% and 1% levels respectively). Thus, it does appear that the external labor market considers relative-to-industry stock performance in assessing managerial ability. Relative-to-industry accounting performance is also positive and in most cases at least weakly significant.

Turning to the industry performance variables in Column 1 of Panel A2, the estimated coefficients are in all cases insignificant. Recall that if the external labor market takes advantage of any biases by old employers in inefficiently relying on industry performance to assess managerial ability, we would expect a negative coefficient on these industry performance variables. Conversely, a positive coefficient would be consistent with new employers making the same types of inference mistakes as prior employers. The small, insignificant, and changing sign of the industry performance coefficients across models casts doubt on both of these scenarios.[9]

Since our testing strategy is motivated more by the market for retreads, we estimate logit models separately for the job jump outcomes (Column 2) and retread position outcomes (Column 3). The results in these models are similar to when we group both types of job movements together, with some changes in significance levels likely owing to the smaller set of events being predicted in each column. In Column 4, we look separately at individuals who obtain a CEO role at a new employer (jumpers and retreads together), as this is a particularly successful labor market outcome. Again, the coefficients tell a similar story as the other models.

Summarizing these findings, the coefficients in the first two panels of Table 3 indicate in all cases that a firm's relative-to-industry performance is positively related to external labor market movements. The coefficients are most consistently significant for stock returns and

[9] The magnitudes of the coefficients in the raw returns models are difficult to gauge since they are not normalized by the variance of the returns. However, the percentile variables are effectively normalized to follow a uniform distribution. As the table reveals, the insignificant point estimates on the industry performance variables are also generally much smaller in magnitude than the coefficient on relative-to-industry performance.

change in accounting ROA, both measured on a percentile basis. This finding is similar to Fee and Hadlock (2003) and suggests strongly that external labor markets use an adjusted or ordinal version of innovations to firm performance in their assessment of possible outsiders to hire. More importantly for our purposes, the coefficients on the industry performance variables vary in sign across the models and in all but one case are insignificant. In the case of the 3-year change in ROA, we do find a weakly positive relationship between job prospects for retreads and industry performance. However, we are hesitant to emphasize this result given the weakness of the result (t=1.74), and the fact that the percentile version of this industry performance measure is not significantly related to these same job outcomes.

For robustness, we explore several alterations to these models. First, we consider using 1-year rather than 3-year versions of the stock return metrics. Relative-to-industry performance on this dimension is generally even more strongly related to subsequent employment likelihood, but the estimates on industry performance remain insignificant in all cases. We also experiment with using the 1-year change in ROA in place of the 3-year change. The resulting industry performance coefficients are substantively unchanged. In light of some of the findings we report below, we also experiment with linear regression models in place of logit models and also with logit models that drop the relative-to-industry performance variable and include only industry performance. These model alterations have no substantive effect on the inferences that we report above.

The preceding models do not include industry fixed effects. In the case of industry stock returns and industry changes in ROA, inclusion of industry effects makes little sense to us, since innovations in industry performance should be approximately orthogonal to any permanent differences in job prospects that vary at the industry level.[10] In the case of the level of industry

[10] We have checked and our findings on industry stock returns and changes in accounting performance are substantively unchanged by including industry fixed effects in the estimated models.

ROA, it is certainly possible that the persistent nature of this measure may indirectly result in some (positive or negative) collinearity between time invariant aspects of industry performance and job prospects that have little to do with the performance attribution issues we are interested in here.

To investigate, we consider the effect of adding industry effects to the models with the level of ROA as the performance metric. These estimates are reported in Panel B of Table 3. Interestingly, in these models we detect a positive and consistently significant relation between industry performance in the any job model (column 1) and in the retread job model (column 3). This suggests that once industry effects are accounted for, a relatively high level of industry accounting performance is associated with better job prospects for dismissed CEOs.

While this finding is certainly interesting, there are several reasons that it appears highly unlikely to reflect an external labor market performance attribution error that mimics a similar internal error. First, we see no parallel behavior with respect to stock returns, despite the fact that stock returns generally play a larger role in managerial labor market decisions. Second, in these same models, we find no significant role for a firm's own relative-to-industry accounting performance, suggesting that accounting performance in this modeling context is not being used to update inferences regarding innate ability. Finally, we find no corresponding result in models without fixed effects (Panel A2), suggesting a puzzling average negative correlation between industry ROA and industry job prospect fixed effects. Given these observations, it would appear that the role of industry ROA in job prospects after controlling for industry effects is most likely related to a correlation between industry performance and the presence/development of certain skills that are in high demand. We will consider this general hypothesis more broadly when we study the identity of CEO replacements.

5. Internal Labor Markets Revisited

5.1 Initial Evidence

The preceding evidence offers little convincing support for inefficiency-based explanations of the lack of RPE in CEO turnover. This suggests that any lack of RPE in turnover is more likely to reflect optimal job matching considerations that vary with industry conditions. However, before researchers further explore these matching considerations, it may be prudent to more fully describe the extent to which industry RPE actually fails to describe CEO turnover given the mixed prior evidence. This will allow us to gauge the extent to which matching may have an industry component and provide clues as to the nature of any such matching process.

To investigate, we calculate CEO turnover rates grouped by both deciles and quartiles for all three types of identified turnover (generic, overtly forced, and severance pay). We adopt the common approach in the turnover literature of measuring stock returns over the 12 month period preceding the potential turnover fiscal year. The summary statistics in Panel A of Table 4 are consistent with earlier figures and indicate that firm performance relative to industry is relatively poor in the year preceding a turnover event compared to the non-turnover observations. Interestingly, the figures do not indicate the presence of lower than average level of industry stock returns prior to turnover, but they do hint at relatively low industry rates of accounting profitability.

Comparing turnover rates between the top and bottom performance deciles and quartiles, the figures in the first three rows of Panel B of Table 4 clearly indicate a strong negative relation between a firm's relative-to-industry stock return performance and turnover rates. This result holds for all three turnover categorizations, and the differences are highly significant (p-values less than .01). This negative relation has been widely documented in prior studies.

Turning to the role of industry stock performance, the univariate statistics for the top and bottom performance deciles in Table 4 reveal no evidence that CEOs are blamed or credited for

industry factors that are beyond their control. In the case of generic turnover, the CEO turnover rate is actually significantly lower (at the 10% level) in the worst industry performance decile compared to the best, opposite of the predicted sign. For the other two definitions of turnover (overtly forced and severance), the difference in turnover rates across industry performance deciles is both small in magnitude and far from significant. Similar remarks apply to the quartile comparisons. This initial evidence casts some doubt on the notion that executives are blamed or credited for industry factors that are beyond their control in the context of the CEO turnover decision, at least within a large and comprehensive sample over a long time period. This is a puzzling finding in light of recent evidence to the contrary. We will investigate the robustness of this evidence to adding control variables in our multivariate analysis below.

Turning to accounting performance, the figures in Table 4 indicate, not surprisingly, a negative relation between a firm's relative-to-industry ROA and CEO turnover rates for all three categorizations of turnover. More interesting and relevant for our purposes, the figures on industry accounting performance do suggest a lack of full RPE on this dimension. In particular, for all three of the turnover categorizations, the CEO departure rate in the worst accounting performance industry decile exceeds the figure for the best decile, and in one case (generic turnover), this difference is significant at the 5% level with a turnover rate of 11.07% in poor performing industries and 9.89% in top performers. The difference is even larger and more significant comparing the top and bottom quartiles. We will attempt to confirm and explore this finding in the multivariate modeling below.

5.2 Multivariate Evidence

We next consider multivariate logit models predicting turnover outcomes (turnover = 1, no turnover = 0). Each estimated logit model includes a single performance pair composed of a relative-to-industry performance variable and the corresponding industry performance. With the

exception of the percentile measures, the relative-to-industry performance metrics are created from first-stage regression residuals. The control variables in all models are CEO age, an age greater than 60 dummy, tenure, firm size, and year dummies. For brevity, we report in Table 5 only the coefficients on the performance variables. We report results for the three turnover categorizations (Columns 1 – 3), and also for overtly forced turnover restricted to S&P 1500 firms (Column 4), as this model/sample is a closer match to Jenter and Kanaan (2013).

As Table 5 reveals, the coefficients on a firm's relative-to-industry performance in Panel A1 are in all cases negative and significant. Thus, regardless of the performance measure (stock, accounting, raw, percentile) and turnover categorization (generic, forced, severance) it is clear that poor firm performance is associated with a significantly greater likelihood of CEO turnover. This is consistent with our univariate evidence above and also the prior literature.

Turning to the first two rows of Panel A2 of Table 5 pertaining to industry stock return performance (raw and percentile versions), the coefficient estimates are mostly negative (6 of 8), and in two cases they are significant at the 10% level, although of small relative magnitude. While these results hint at a slight lack of full RPE, they are certainly much weaker and less convincing than much of the recent evidence on this issue, despite the larger size of our sample. Moreover, to the extent the results hint at a lack of full RPE, they appear somewhat at odds with the earlier univariate evidence. This is perplexing, as the added control variables in the multivariate models should all be approximately uncorrelated with the stock return variables.

To explore further, we modify slightly these models using industry stock returns by dropping only the firm's relative-to-industry performance variable from the estimated models (estimates untabulated). In all of these models, industry stock performance is exceedingly small in magnitude and far from significant. Since relative-to-industry performance and industry performance are orthogonal, it is surprising that we observe any substantive change when we drop one variable. However, given the nonlinearity of the logit model, the usual intuition

regarding inclusion of orthogonal variables does not apply. If we instead estimate linear probability models (i.e., a traditional linear regression), we obtain nearly identical estimates on industry performance with or without a relative-to-industry performance control, and in all cases the coefficients on industry stock returns are small in magnitude and far from significant. Our conclusion from this evidence is that the case for a widespread lack of RPE in stock returns is not robust. It appears only weakly in our data in a few special models, and in these cases it appears to reflect the peculiarity of the logit model rather than a true underlying relation.

The coefficient estimates on the industry accounting performance variables in the remaining rows of Panel A2 of Table 5 are also interesting. These coefficients are in all cases negative and in most cases highly significant and with reasonably large magnitudes. This indicates that CEOs are dismissed at a relatively high (low) rate when an industry is performing poorly (well), suggesting a lack of RPE with respect to industry accounting profitability rather than stock returns. It is worth noting that the earlier univariate results (more weakly) suggested the same result. Moreover, if we drop the firm relative-to-industry performance variable or estimate a linear probability model, the significant negative estimates on the industry accounting performance variables remains. Thus, it does appear that there is a robust lack of full RPE in CEO turnover, but only with respect to accounting performance.[11]

The models in panels A1 and A2 of Table 5 do not include industry effects. It is possible that there is some variation in industry turnover rates that is correlated with the industry performance measures, in particular the level of accounting performance as this variable can display persistent long-run differences across industries. As we report in Panel B of Table 5, we still find a significant role for industry ROA in predicting turnover even when we include

[11] We have experimented with using the 3-year change in ROA in place of the 1-year change in these models. The results with this alteration with respect to industry performance are substantively unchanged. Huson, Parrino, and Starks (2001) report that level of ROA has a more significant effect on CEO turnover than changes in ROA.

industry effects, although the effect is only strongly significant for the models predicting all turnover events (i.e., Column 1). Results for the one year change in ROA with industry effects are similar (estimates untabulated), but only significant for the percentile version of industry performance in the model predicting all turnover. The estimates on industry stock returns are substantively unchanged when we include industry fixed effects. Thus, the evidence against RPE for accounting performance appears to weaken slightly when industry effects are included, while the evidence in support of full RPE with respect to stock returns is substantively unaltered.

5.3 Robustness of Turnover Findings

The preceding findings are surprising in light of several recent papers suggesting a puzzling lack of RPE with respect to industry stock returns in CEO turnover, while our evidence indicates full RPE on this dimension. Our results suggest that any RPE puzzle to be sorted out arises on the industry accounting profitability dimension. Given the differences between our results and many of the recent related studies, we attempt to sort out the sampling or modeling choices that may lead to these differences. This will serve as a robustness check of what we report above, and may offer insights concerning how industry information is filtered in the CEO evaluation process.[12]

Since some authors measure industry performance using value-weighted measures of industry stock returns, we have experimented with using these returns in the Table 5 models. The results with this alteration are substantively unchanged from what we report above.[13] We have also experimented with using 36-month stock returns in place of 12 month returns. Again,

[12] In addition to the tests described here, we have also experimented with restricting attention to executives under the age of 60 and to executives with a tenure of at least 2 years. Results with these modeling alterations are similar to what we report in the table, with a slight weakening of the evidence against RPE for accounting performance.

[13] Unless mentioned otherwise, all of the modeling alterations described in the text use the same exact modeling choices as in the tables with regard to compounding, timing conventions, winsorization procedures, etc.

the results are substantively unchanged with this alteration. Our choice of Fama-French industry groupings is consistent with many recent investigations. However, earlier authors typically use 2-digit SIC codes to measure industry performance. If we use 2-digit industry definitions, the results are quite similar to what we report in Table 5 in the sense of little convincing evidence that RPE does not hold for industry stock returns, but substantial evidence of a lack of full RPE for industry accounting performance.

The evidence in Jenter and Kanaan (2013) suggests that inefficiently hiding behind good luck may be more common than being blamed for bad luck. Thus, we experiment with separating firms into those with industry-adjusted stock returns above or below zero, as the former group is exposed to blame for bad luck risk, while the latter group has the potential to hide behind good luck. When we separate the sample in this way we find little robust evidence of lack of RPE with respect to stock returns for both the under and overperformers.

Our modeling follows Gibbons and Murphy (1990) in using continuously compounded returns. This treatment, which contrasts with several recent studies, effectively compresses the performance data and yields fewer extreme outliers. The percentile measure takes this compression further by transforming the data into a uniform distribution. Theory offers little guidance, as most theoretical treatments assume the presence of a normally distributed performance metric, an assumption that is surely false for unadjusted returns. To investigate, we have experimented with using non-compounded stock returns for both firm and industry performance. The case against RPE superficially appears slightly stronger with this modification, as the coefficient on industry stock returns in the overtly forced model (i.e., Column 2 of Table 5) becomes negative and significant at the 5% level. However, if we modify this model by either dropping the relative-to-industry performance term or estimating a linear probability model, the industry coefficient again becomes small in magnitude and insignificant.

This again indicates that the general case against full RPE with regard to industry stock returns is quite fragile.[14]

5.4 Reconciling the Evidence – A Methodological Detour

While our evidence in support of full RPE with respect to industry stock returns appears fairly robust, we are still left with the perplexing issue of the source of the difference between our findings and those in other recent studies. One possibility is that there is a lack of RPE in certain time periods. However, when we restrict attention to the 1992-2001 period examined by Jenter and Kanaan (2013), the results with respect to the role of industry stock returns in CEO turnover are very similar to what we report in Table 5.

Given that secular trends in the use of RPE are not readily apparent in our sample, we have explored a wide variety of model alterations and/or subsample selections to try to identify the circumstances under which a lack of RPE with respect to industry stock returns might appear in the data. In general, the evidence against full RPE with respect to industry stock returns tends to be stronger when we (a) use simple unadjusted returns rather than continuous compounding, (b) restrict attention to relatively larger firms, and (c) predict overtly forced turnover rather than the broader turnover categories. However, in all models in which we identify a (usually marginally) significant coefficient on industry returns, the magnitude and significance of the industry coefficient in all cases drops precipitously when we either (i) drop the relative-to-industry performance variable or (ii) estimate a linear probability model (i.e., a linear regression with a 0/1 dependent variable) in place of the logit estimation. Thus, it appears unlikely that a lack of RPE with respect to industry stock returns is robustly present anywhere in our sample.

[14] We have also experimented with (a) restricting attention to S&P 500 firms only, (b) using the firm performance data in unwinsorized form, and (c) estimating Cox proportional hazard models rather than logit models. With all of these alterations we continue to find no robust evidence of a negative relation between industry stock performance and CEO turnover.

The sensitivity of the logit model to the inclusion/exclusion of orthogonal variables is both surprising and concerning. To investigate, we have experimented with simulated data. In particular, we use the coefficients corresponding to the estimated models in the first row of Table 5 excluding the industry return coefficient to create predicted turnover probabilities. We then simulate a binary 0/1 dependent variable using random draws from a uniform distribution to obey these predicted probabilities. Thus, we create a sample that is mechanically constructed to display a version of full RPE in the sense that turnover depends only on continuously compounded relative-to-industry returns. We then proceed to use the simulated data to estimate a corresponding logit model that includes non-compounded relative-to-industry returns and also industry returns, along with the other control variables.[15]

We undertake this process 1,000 times for each of the four dependent variables/sampling choices in Table 5 (i.e., the models in each of the four columns). Quite remarkably, the coefficient estimate on the industry return variable in these models is significant in an abnormally large number of cases. For example, in simulations corresponding to the Table 5, Column 2 model, we obtain significance on the industry return variable at the 5% level in 42.1% of these cases, with a median p-value of .076. The results are similar in character, but less dramatic, in the column 1 and 4 models of Table 5.

This evidence indicates that turnover decisions that (by construction) display a version of full RPE (i.e., with continuously compounded returns) can appear to lack full RPE if one relies on estimates from a logit model assuming a different functional form (i.e., dependence on non-compounded returns). The problem gets worse if we do not winsorize the returns data. Only the models using the severance pay definition of turnover (i.e., the column 3 model) appear immune from this problem. Notably, the inflated rate of false positives on the industry return variable

[15] The relative-to-industry and industry returns variables are calculated using fitted values and residuals from a first stage regression, just as in the continuously compounded case.

falls close to what would be predicted by chance if we either (i) drop the relative-to-industry performance terms, or (b) estimate linear probability models instead of logit models.

This analysis illustrates that nonlinear models such as the logit model can be sensitive to functional form assumptions. Since the theory offers few clear predictions on the correct functional form, we believe a prudent approach for all future tests of RPE is to consider a variety of models as robustness checks including: (a) simple univariate evidence, (b) linear regression models in addition to logit models, and (c) models that drop relative-to-benchmark performance in tests of whether the benchmark plays an independent role in turnover. As we show above, any weak evidence we detect that suggests a failure of full RPE with respect to industry stock returns does not survive these robustness checks. However, our evidence on the failure of RPE with respect to accounting performance does appear to be robust.

6. Movement of human capital across firms and industries

As we show above, there does appear to be a lack of full RPE in turnover with respect to accounting performance in the sense that CEOs are dismissed at an elevated (reduced) rate when industry ROA is low (high). However, our earlier external labor market evidence for departed CEOs offers little convincing support for the hypothesis that this reflects some underlying inefficiency in the turnover process. This leaves as a more plausible explanation the hypothesis that the optimal leader for a firm may change with industry (accounting) conditions. Eisfeldt and Kuhnen (2013) present a specific model of this type. In their model, an industry that experiences a negative shock is more likely to demand the skills possessed by industry outsiders, resulting in an equilibrium movement of talent across industries subsequent to such a shock.

Given the large sample at our disposal, we explore here how optimal CEO-firm matches may covary with industry conditions with a particular emphasis on accounting performance given our preceding findings. While the relative desirability of many different managerial

characteristics may change with industry conditions, we focus on the role of industry performance in the decision to hire a firm and/or industry outsider. These characteristics are easy to measure/identify, and they should serve as reasonable proxies for a relatively sharp shift in the desired set of managerial skills or experiences that are believed to be optimal in a firm's CEO. This part of our analysis is exploratory in nature, but has some similar empirical goals to the analysis of Parrino (1997) and Eisfeldt and Kuhnen (2013). Any systematic relation between industry performance and the type of replacement manager chosen would be consistent with the hypothesis that there is a substantive industry performance component to the demand for certain managerial skill sets and can serve to inform future thinking on the underlying demand/supply relations.

6.1 Univariate evidence on replacement CEOs

We first examine univariate data on the identity of replacement CEOs grouped by performance quartiles. In Panel A of Table 6 we examine whether the replacement CEO is a firm insider or outsider. Consistent with Parrino (1997), it is clear from these figures that poor relative-to-industry firm stock and accounting performance are both closely linked to the decision to hire a firm outsider.

Next we turn to the role of industry performance. In the case of stock returns, there is no evident relation between industry performance and the propensity to hire an outsider. However, poor industry accounting performance as measured by the level or 1-year change in ROA is clearly associated with more outside hiring. These findings on firm performance are consistent with the notion that firms seek a new leadership approach when the firm is underperforming its peers. The industry performance findings are consistent with the idea that a new set of skills is demanded when an industry is experiencing low profitability (as manifested in low accounting

profitability), but not necessarily when the firm experiences a negative value shock (i.e., low stock returns).

When firms hire outside CEOs, they also choose whether to hire a replacement from inside or outside the industry. In Panel B of Table 6 we report figures on this choice, again by performance quartile.[16] As the figures in the table illustrate, conditional on hiring a firm outsider, there is no evident relation between firm or industry stock returns and the propensity to hire an industry outsider. In the case of accounting performance, there is no significant evidence that firm performance is related to outside-the-industry hiring, but some evidence that better industry performance is associated with more of this type of hiring. In particular, in the case of the level of industry ROA, there is a significantly greater rate of outside-the-industry hiring for the top quartile compared to the bottom (75.31% vs. 65.98%, p value<.01). Coupled with the evidence on hiring from outside the firm, this evidence suggests that when an industry is performing poorly, there is relatively more reshuffling of managers across firms within the industry, rather than across industries.

6.2 Multivariate evidence

To examine these issues in a multivariate context, in Table 7, we estimate a set of logit models predicting the identity of the replacement CEO.[17] Each estimated model includes a

[16] We determine the most recent employer from biographies in the 10-K or Annual Report. We then match this employer with the COMPUSTAT file if possible. If a firm is not on Compustat, we ascertain the firm's industry from a variety of directories and web searchers. In a handful of cases in which the industry cannot be identified, we assume the individual comes from a different industry. The results we report are robust to excluding these cases or assuming the individual came from the same industry. We code a CEO as firm outsider if he/she is hired from outside the current employer, the outside firm is not a subsidiary or a related company, and the individual is not the company's founder. Individuals who are promoted from within the firm but were hired from outside the firm within 12 months of the promotion are considered outsiders.

[17] Given our earlier warnings about logit models, it is worth noting that the character of the results regarding industry performance from the logit models presented in Table 7 are substantively unchanged if we drop the relative-to-industry performance variable or estimate the corresponding linear regression models. All raw firm performance variables in Table 7 are created from first-stage regression residuals as in the earlier multivariate models.

single distinct pair of performance variables (firm performance relative to industry and the corresponding industry performance), along with the control variables used in earlier models. To maintain consistency with Eisfeldt and Kuhnen (2013), all models include industry fixed effects. Exclusion of these effects has little impact on our estimates. The firm performance coefficients are collected in Panel A, and the corresponding industry performance coefficients are reported in Panel B.

We first consider models predicting whether the firm hires a firm outsider (dependent variable=1) versus an insider. The estimates, reported in Column 1, are similar in character, but stronger than, the univariate results. In all cases (stock, accounting, raw, percentile, levels, changes) we find a negative relation between both firm and industry performance and the likelihood of hiring a firm outsider. In most (all) cases the estimated coefficient is highly (at least weakly) significant.

We next turn to the decision to hire an industry outsider vs. an insider, conditional on going outside the firm. The estimates in Column 2 reveal no significant dependence of this choice on the various performance measures. The firm performance coefficients vary in sign across models. In the case of industry performance, in most cases the coefficients are positive, but only one is significant and suggest that recent 1-year changes in ROA are positively related to the likelihood of hiring an industry outsider if the firm goes to the outside for a replacement.

To complete the picture, we next ask whether the net movement of CEO talent across industries varies with industry performance. We code the dependent variable as a 1 if an individual from outside the firm and outside the industry is hired. The dependent variable is coded as a 0 if the firm chooses a replacement who is either a firm insider or a same-industry outsider. The negative and significant estimates in Panel A of Column 3 of Table 7 indicate convincingly that there is more outside-the-industry hiring after a turnover when a firm is

performing poorly in either a stock return or accounting profitability sense. These findings appear to reflect the fact that firms tend to hire more firm outsiders when they are performing poorly (the column 1 results) and the majority of firm outsiders do come in general from outside the industry.

Turning to the industry performance variables in Panel B, the coefficients in Column 3 are in all cases negative but insignificant. Given the estimates in the other columns, this insignificance likely reflects the counteracting forces of a clear increase in outside-the-firm hiring when industry performance is poor, but also a slight hint in the data towards more inside-the-industry hiring when industry performance is poor and an outsider is selected. Clearly there is little evidence of a strong role for industry performance in wholesale changes in the industry backgrounds of executives. However, it is clear that industry performance does play a role in the decision to make a larger management change in the form of hiring from outside the firm.

Our empirical modeling is somewhat different from Eisfeldt and Kuhnen (2013) who report that an indicator of a decrease in industry performance is associated with more outside-the-industry hiring conditional on going outside the firm. No similar pattern emerges in our sample as mentioned above in our discussion of Column 2 of Table 7. Certainly though much of we report in Table 7 is consistent with the more general notion advanced by Eisfeldt and Kuhnen (2013) that firm and industry performance are related to the equilibrium allocation of talent both within and across industries. It is clear that poor firm and industry performance, no matter how they are measured, are related to an enhanced likelihood of hiring a firm outsider. While the firm performance result may not be surprising, the industry performance result is quite interesting in that it indicates that poor industry conditions are associated with an increased demand for a relatively sharper change in the desired managerial skill set and thus an increased demand for a firm outsider.

7. Conclusion

We examine the relation between a variety of labor market outcomes and industry conditions to assess the extent to which a simple learning view of managerial job allocation decisions and full industry relative performance evaluation (RPE) adequately explains firing and hiring decisions. We undertake this analysis in a large and comprehensive sample of over 60,000 firm-years and nest many prior modeling choices into our empirical tests. This analysis allows us to present a fairly complete picture of the career consequences and determinants of CEO turnover and the subsequent replacement decision.

With respect to stock returns, we find that industry conditions are not associated with CEO turnover or a CEO's job prospects after turnover. However, poor industry stock returns are associated with more outside-the-firm hiring conditional on a CEO dismissal. In the case of stock returns, this evidence suggests that (a) a simple learning view with full RPE is a reasonable description of typical CEO dismissal decisions, (b) any deviations from RPE are unlikely to reflect information filtering errors by employers, and (c) there is an industry stock return component to the demand for certain managerial skills that does not trigger a turnover decision but does influence the choice of the identity of the replacement.

The picture is richer on the accounting performance dimension. Here we find a clear lack of RPE in the CEO turnover decision, with poor industry accounting performance being associated with higher turnover rates. We also uncover some very limited evidence hinting at the possibility that poorer industry accounting performance is associated with poorer post-turnover labor market outcomes for dismissed CEOs. On balance this appears likely to reflect some sort of demand effect for certain managerial skill sets that is correlated with industry conditions. As with stock returns, we find more outside-the-firm hiring after turnover when an industry is performing poorly in an accounting sense, and a hint towards more within-the-industry hiring conditional on going outside the firm. While no simple model can explain all of these patterns

on the accounting side, the evidence strongly suggests that industry accounting conditions are related to the optimal type of manager that should be leading a firm with more frequent (increased turnover) and larger changes (more outside hiring) when an industry is experiencing low cash flows.

Several interesting points and new questions emerge from this analysis. First, much of the recent focus on the puzzling failure of RPE in turnover and concerns about efficiency seem misplaced. The puzzle is more on the accounting side, and it appears unlikely that any lack of RPE reflects inefficiencies and is therefore likely to reflect some type of technological demand channel. We also offer evidence suggesting that tests for the presence or lack of RPE in turnover can be quite model and sample specific, in part because of the nonlinearity in the underlying empirical models.

Further work will need to identify the demand and supply factors that covary with various industry accounting metrics, but not stock returns, and the consequent implications for both incentives and firm performance. The model of Eisfeldt and Kuhnen (2013) is a promising start towards a model of the equilibrium allocation of managerial skills across firms, although much is yet to be explained. We conjecture that the diverging results for the two types of performance measures could reflect a phenomenon where poor stock industry returns not associated with low accounting performance are driven by distant future anticipated cash flow trajectories (i.e., changes in expected growth, regulations, taxes, or competitive environment). In this case, the optimal current management style or skill set may be determined entirely by the current operating environment as reflected in cash flows and accounting metrics, thus explaining a larger role for these types of measures. However, at this stage this is just speculation.

On the incentive side our results indicate that CEOs do bear some career risk with respect to industry accounting performance, but not stock performance. If an industry is performing poorly an executive is more likely to lose his/her position. As we show, job prospects for

dismissed CEOs are quite dim, and if anything they are in some cases even dimmer when they leave the helm of firm in an industry with poor accounting performance. Whether this incentive structure has an effect on CEO decisions and firm policies is an additional interesting question for future research.

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Table 1 – Sample Characteristics

	Number/Statistic	Percent/rate
Number of Firm Years	61,164	
Mean Book Assets (1990 $mil)	1,361.41	
Median Book Assets (1990 $mil)	127.92	
Number of CEO turnover events	6,877	11.24%
Turnover events, age<60	4,511	9.65%
Turnover events, age≥60	2,366	16.39%
Median age upon turnover	56	
Turnover Events – overtly fired	533	0.87%
Turnover events – severance paid	630	4.54%
Hiring events – got job	326	4.74%
Hiring events – jump job	56	0.81%
Hiring events – retread job	270	3.93%
Hiring events – age<55	239	7.60%
Hiring events – 55 ≤ age <60	56	4.10%
Hiring events – 60 ≤ age <65	22	1.69%
Hiring events – age ≥ 65	9	0.84%
Hiring event – gets a new CEO job	258	3.75%

Note.- The sample includes all Compustat firm-years from 1990 to 2007 with the exception of utilities, financials, foreign firms, firms with less than $10 million in assets (in 1990 dollars), and firms not listed in the Compustat name file. Turnover events are all cases with a confirmed change in the identity of a firm's CEO during the observation year. All events for an indicated age category are based on a CEO's age at the start of the observation year and the percentages/rates are calculated within the set of all observations in the age category. If no age range is indicated, the statistics and percentages/rates are for all sample observations. Overtly fired turnover events are cases in which a news article indicates a forced departure. Severance turnover events are cases in which an apparent severance-related payment was made to a departing CEO. Severance information was only collected for 1992-2007 for S&P 1500 firms and the rate of turnover for this category is calculated over this subsample. Hiring events - got job are all cases in which we detect that a CEO assumes a full-time executive role at another sample firm within 48 months of departure. Jumps are hiring events that occur within 31 days of departure and retread events are all other cases. Hiring rates are calculated within the set of all sample turnover observations, or the subset of these observations falling within the indicated age range.

Table 2 – The Role of Firm and Industry Performance in New Employment Opportunities

Panel A: Performance for all turnover obs.	Mean	Median	Std. Dev.	Obs.	
Firm 36 month stock return, cont. compound.	-2.94%	0.28%	31.66%	5,033	
Industry 36 month stock return, cont. compound.	13.51%	14.01%	12.76%	5,033	
Firm 36 month stock return, percentile version	0.44	0.41	0.29	5,030	
Industry 36 month stock return, percentile version	0.51	0.52	0.29	5,033	
Firm return-on-assets (ROA)	-1.13%	4.72%	23.06%	6,854	
Industry return-on-assets (ROA)	1.95%	5.63%	10.00%	6,877	
Firm return-on-assets, percentile version	0.45	0.42	0.29	6,851	
Industry return-on-assets, percentile version	0.49	0.47	0.29	6,877	
Panel B: Hiring outcomes by performance quart.	Quart. 1	Quart 2.	Quart. 3	Quart. 4	Q1 vs. Q4 (p-val)
Got job – firm relative-to-industry stock return	5.53%	6.05%	6.84%	8.56%	.02
Got job – firm relative-to-industry ROA	5.87%	5.61%	7.48%	7.30%	.17
Got job – industry stock return quartiles	6.57%	5.92%	7.76%	6.71%	.91
Got job – industry ROA quartiles	6.29%	5.38%	7.65%	6.84%	.59
Jump Job – firm relative-to-industry stock return	0.92%	0.92%	1.18%	2.11%	.06
Jump Job– firm relative-to-industry ROA	0.98%	0.89%	1.16%	1.69%	.14
Jump Job – industry stock return quartiles	1.45%	1.05%	1.45%	1.18%	.66
Jump Job – industry ROA quartiles	1.06%	1.15%	1.25%	1.24%	.69
Retread Job – firm relative-to-industry stock return	4.61%	5.13%	5.66%	6.46%	.11
Retread Job– firm relative-to-industry ROA	4.89%	4.72%	6.32%	5.61%	.45
Retread Job – industry stock return quartiles	5.12%	4.87%	6.32%	5.53%	.73
Retread Job – industry ROA quartiles	5.23%	4.24%	6.41%	5.60%	.69

Note.- The figures in Panel A pertain to all of the 6,877 sample turnover observations with the available data. A firm's stock return is calculated as the continuously compounded return over the 36 month period ending at the start of the observation year, winsorized at the 1% and 99% sample tails. Industry return is the continuously compounded return on the equally-weighted portfolio of all firms in the same Fama-French 49 portfolio industry, rebalanced monthly. Firm ROA is calculated as EBIT/(average of start and end year assets) as of the most recent fiscal year end preceding the observation year, winsorized at the 1/99 Compustat universe tails. Industry ROA is calculated using the industry median ROA for the fiscal year. Percentile figures in Panel A are scaled to fall between 0 and 1. In the case of firm-statistics (industry-statistics) these are calculated for each observation based on the set of all sample observations (i.e., turnover and non-turnover observations) within the same industry-year (same year). In Panel B we calculate the new position hiring rate for all turnover CEOs under the age of 60 in the indicated quartile of all turnover observations where quartiles are calculated using the percentile performance measure and thus are effectively industry-year adjusted for firm-performance quartiles and year adjusted for the industry-performance quartiles. Quartile 1 is the lowest performance quartile and the indicated p-value is for a simple t-test of whether the indicated rates for Quartiles 1 and 4 are significantly different from each other.

Table 3 – Performance Coefficient Estimates from Logit Models of Hiring Outcomes

Job Outcome Predicted by Model	Any Job (1)	Jump Job (2)	Retread Job (3)	CEO Job (4)
Panel A1: Firm performance variable				
Firm 36 month relative-to-industry stock return., raw	0.409*	0.691	0.332	0.437*
	(0.230)	(0.526)	(0.252)	(0.259)
Firm 36 month relative stock return, percent. version	0.628***	0.995*	0.525**	0.668***
	(0.235)	(0.532)	(0.258)	(0.263)
Firm return-on-assets (ROA) relative-to-industry, raw	0.173	0.280	0.150	0.276
	(0.290)	(0.702)	(0.315)	(0.335)
Firm relative return-on-assets, percentile version	0.343*	0.814	0.232	0.564***
	(0.208)	(0.479)	(0.277)	(0.230)
Firm 36 month change in relative ROA, raw	0.539*	1.647***	0.129	0.658**
	(0.292)	(0.474)	(0.344)	(0.325)
Firm 36 month change in relative ROA, percentile	0.541**	1.041**	0.414*	0.662***
	(0.217)	(0.510)	(0.237)	(0.245)
Panel A2: Corresponding industry performance				
Industry 36 month stock return, raw	0.397	-1.239	0.751	0.864
	(0.853)	(1.957)	(0.938)	(0.952)
Industry 36 month stock return, percentile version	0.131	-0.260	0.209	0.311
	(0.238)	(0.549)	(0.260)	(0.267)
Industry return-on-assets (ROA), raw	-0.548	0.730	-0.798	-0.301
	(0.756)	(1.924)	(0.815)	(0.855)
Industry return-on-assets, percentile version	0.096	0.054	0.100	0.187
	(0.208)	(0.503)	(0.232)	(0.237)
Industry 36 month change in ROA, raw	2.480	-4.246	3.889*	2.121
	(2.053)	(4.927)	(2.235)	(2.289)
Industry 36 month change in ROA, percent. version	0.146	-0.409	0.266	0.159
	(0.233)	(0.544)	(0.254)	(0.260)
Panel B: Adding industry dummy variables				
Firm relative ROA, raw	0.142	0.198	0.136	0.248
	(0.293)	(0.715)	(0.317)	(0.337)
Industry return-on-assets (ROA), raw	4.376**	-5.265	5.801***	3.880*
	(1.826)	(4.459)	(2.015)	(2.021)
Firm relative ROA, percentile version	0.307	0.831*	0.187	0.530**
	(0.213)	(0.486)	(0.234)	(0.236)
Industry return-on-assets, percentile version	1.048***	-0.753	1.445***	1.012**
	(0.365)	(0.821)	(0.409)	(0.413)

Note.- The reported coefficients are from logit models predicting whether an outgoing CEO in a turnover event obtains a job of the indicated type (coded as a 1) versus not obtaining a job of the indicated type (coded as a 0) within the set of all turnover events. Standard errors are reported in parentheses under each estimate. Figures in this table are calculated over the subset of the 6,877 turnover observations for which we have available data for the indicated statistic. All models include controls for CEO age, an age greater than 60 dummy, tenure, and log of inflation-adjusted firm assets, and year dummies (coefficients not reported). Each estimated model includes a single pair of performance variables pertaining to a firm's relative-to-industry performance prior to the start of the turnover year and the corresponding industry performance variable. The firm relative stock return raw variable (ROA raw variable change in ROA variable) is a residual calculated from a regression of the firm's 36 month compounded stock return (ROA, change in ROA) against the corresponding industry return (industry median ROA, industry median change) using all non-missing observations that are included in the logit model. The industry performance variable in these models is the predicted level of firm performance arising from industry performance (i.e., the estimated regression slope coefficient times industry performance). All other definitions and timing conventions are detailed in the text and notes to prior tables. Panel B differs from the other panels in that Fama French 49 industry dummy variables are included the estimated model.

*Significant at the 10% level

** Significant at the 5% leve

***Significant at the 1% level

Table 4 – The Role of Firm and Industry Performance in CEO Turnover

Panel A: Performance Statistics for Turnover Observations vs. Non-turnover Observations	Mean Turnover	Mean No-turn.	Median Turnover	Median No-turn.		
Firm 12 month stock return, cont. compound.	-15.04%	1.90%	-6.84%	6.00%		
Industry 12 month stock return, cont. compound.	12.76%	12.70%	13.17%	13.01%		
Firm 12 month stock return, percentile version	0.43	0.52	0.40	0.52		
Industry 12 month stock return, percentile version	0.50	0.50	0.50	0.50		
Firm return-on-assets (ROA)	-1.13%	3.60%	4.72%	7.47%		
Industry return-on-assets (ROA)	1.95%	2.45%	5.63%	5.79%		
Firm return-on-assets, percentile version	0.45	0.52	0.42	0.53		
Industry return-on-assets, percentile version	0.49	0.51	0.47	0.50		
Panel B: Turnover Rate by Performance Group	Dec. 1	Dec. 10	D1 v. D10 (p-value)	Quart. 1	Quart 4	Q1 v. Q4 (p-value)
All turnover – firm relative-to-industry returns	18.00%	7.89%	0.00	15.73%	8.56%	0.00
Overtly fired – firm relative-to-industry returns	2.01%	0.34%	0.00	1.71%	0.50%	0.00
Severance pay turn. – firm relative-to-industry	8.44%	3.18%	0.00	6.93%	3.79%	0.00
All turnover – industry stock returns	10.42%	11.57%	0.06	11.15%	11.67%	0.18
Overtly fired – industry stock returns	1.13%	1.00%	0.53	1.10%	1.14%	0.77
Severance pay turn. – industry stock returns	4.84%	4.66%	0.83	4.75%	4.86%	0.83
All turnover – firm relative-to industry ROA	17.27%	8.56%	0.00	15.31%	8.58%	0.00
Overtly fired – firm relative-to-industry ROA	1.67%	0.77%	0.00	1.10%	0.07%	0.00
Severance pay turn.-firm relative-to-industry ROA	6.42%	3.72%	0.06	6.21%	4.19%	0.03
All turnover – industry ROA	11.07%	9.89%	0.03	12.09%	10.36%	0.00
Overtly fired – industry ROA	0.92%	0.85%	0.69	1.07%	0.94%	0.31
Severance pay turn.– industry ROA	5.13%	4.13%	0.22	4.80%	4.64%	0.75

Note.- The figures in Panel A pertain to the subset of the 61,164 sample firm-years for which we have available data and compare all observations (firm-years) with CEO turnover to all observations without CEO turnover. A firm's stock return is calculated as the continuously compounded return over the 12 month period ending at the start of the observation year, winsorized at the 1% and 99% tails. Industry return is the corresponding continuously compounded return on the equally-weighted portfolio of all firms in the same Fama-French industry, rebalanced monthly. Firm ROA is calculated as EBIT/(average of start and end year assets) as of the most recent fiscal year end preceding the observation year, winsorized at the 1/99 tails. Industry ROA is calculated using the industry median ROA for the fiscal year. Percentile figures are scaled to fall between 0 and 1. In the case of firm-statistics (industry-statistics) these are calculated for each observation based on the set of all sample observations within the same industry-year (same year). In Panel B, we calculate the turnover rate of the indicated type for observations in the indicated performance decile or quartile based on the percentile measure of firm or industry performance. Decile (quartile) 1 is the lowest performance decile (quartile). P-values are for a simple test of differences in turnover rates between the highest and lowest performance grouping.

Table 5 – Performance Coefficient Estimates from Logit Models of CEO Turnover

	(1)	(2)	(3)	(4)
Type of turnover predicted in logit model	All turnover	Overtly forced turnover	Severance pay turnover	Overtly forced, S&P 1500 only
Panel A1: Firm performance variable				
Firm 12 month relative-to-industry stock return., raw	-0.604***	-1.126***	-0.778***	-1.701***
	(0.026)	(0.086)	(0.106)	(0.165)
Firm 12 month relative stock return, percent. version	-1.012***	-2.013***	-1.141***	-2.593***
	(0.049)	(0.180)	(0.169)	(0.299)
Firm return-on-assets (ROA) relative-to-industry, raw	-1.189***	-1.733***	-1.258***	-2.354***
	(0.063)	(0.195)	(0.362)	(0.620)
Firm relative return-on-assets, percent. version	-1.055***	-1.887***	-0.709***	-1.530***
	(0.048)	(0.176)	(0.172)	(0.290)
Firm 12 month change in relative ROA, raw	-1.088***	-2.643***	-2.064***	-4.535***
	(0.113)	(0.396)	(0.617)	(0.949)
Firm 12 month change in relative ROA, percentile	-0.534***	-1.267***	-0.668***	-1.753***
	(0.047)	(0.175)	(0.174)	(0.310)
Panel A2: Corresponding industry performance				
Industry 12 month stock return, raw	-0.010	-0.342	0.036	-0.467
	(0.070)	(0.243)	(0.303)	(0.490)
Industry 12 month stock return, percent. version	-0.062	-0.266*	-0.161	-0.568*
	(0.048)	(0.160)	(0.148)	(0.242)
Industry return-on-assets (ROA), raw	-0.830***	-1.915***	-3.215*	-8.405***
	(0.161)	(0.529)	(1.931)	(3.140)
Industry return-on-assets, percent. version	-0.409***	-0.680***	-0.403***	-0.998***
	(0.046)	(0.157)	(0.146)	(0.241)
Industry 12 month change in ROA, raw	-1.910***	-4.971**	-1.415	-6.028
	(0.646)	(2.144)	(2.261)	(3.771)
Industry 12 month change in ROA, percent. version	-0.156***	-0.460***	-0.255*	-0.530**
	(0.046)	(0.156)	(0.143)	(0.235)
Panel B: Adding industry dummy variables				
Industry return-on-assets (ROA), raw	-0.944**	-2.629*	1.951	-2.023
	(0.397)	(1.410)	(5.029)	(9.216)
Industry return-on-assets, percent. version	-0.200**	-0.497*	0.120	-0.785*
	(0.081)	(0.293)	(0.266)	(0.451)

Note.- The reported coefficients are from a logit model predicting whether a CEO turnover of the indicated type occurs in a given observation-year with the dependent variable assuming a value of 1 (0) if turnover of the indicated type does (does not) occur. Standard errors are reported in parentheses under each estimate. Figures in this table are calculated over the subset of the 61,164 sample years for which we have available data for the indicated statistic. The sample in Columns 1 and 2 includes all firm years while the sample in Column 3 (Column 4) includes only observations in the S&P 1500 with electronic proxy statements available (all firms in the S&P 1500). All models include controls for CEO age, an age greater than 60 dummy, tenure, and log of inflation-adjusted firm assets, and year dummies (coefficients not reported). Each estimated model includes a single pair of performance variables pertaining to a firm's relative-to-industry performance immediately prior to the observation year and the corresponding industry performance variable. The firm relative stock return raw variable (ROA raw variable, change in ROA) is a residual calculated from a regression of the firm's 12 month compounded stock return (ROA, change in ROA) against the corresponding industry return (industry median ROA, industry median ROA change), using all non-missing observations that are included in the logit model. The corresponding industry performance variable in these models is the predicted level of firm performance arising from industry performance. All other definitions and timing conventions are detailed in the text and notes to prior tables. Panel B differs from the other panels in that Fama French 49 industry dummy variables are included the estimated model.

*Significant at the 10% level

** Significant at the 5% level

***Significant at the 1% level

Table 6 – The Role of Firm and Industry Performance in Replacement Manager Origin

	Quart. 1	Quart 2.	Quart. 3	Quart. 4	Q1 vs. Q 4 (p-val.)
Panel A: % of replacements from outside the firm					
Firm 12 month relative stock return	54.27%	45.46%	38.74%	35.05%	0.00
Firm 36 month relative stock return	53.35%	45.25%	36.55%	32.59%	0.00
Firm relative return-on-assets (ROA)	54.49%	50.80%	39.88%	33.23%	0.00
Firm 12 month change in relative ROA	53.24%	42.68%	36.43%	44.18%	0.00
Firm 36 month change in relative ROA	49.45%	44.79%	35.89%	41.26%	0.00
Industry 12 month stock return	44.57%	44.61%	41.53%	42.71%	0.31
Industry 36 month stock return	40.74%	43.66%	41.76%	41.26%	0.80
Industry return-on-assets (ROA)	50.06%	45.32%	44.27%	38.57%	0.00
Industry 12 month change in ROA	47.50%	44.62%	44.24%	41.98%	0.00
Industry 36 month change in ROA	47.36%	43.62%	43.21%	44.11%	0.06
Panel B: % of outside replacements from outside the industry					
Firm 12 month relative stock return	70.02%	71.00%	66.45%	69.81%	0.94
Firm 36 month relative stock return	70.94%	70.34%	72.75%	66.33%	0.12
Firm relative return-on-assets (ROA)	72.26%	66.81%	68.43%	70.89%	0.57
Firm 12 month change in relative ROA	70.83%	68.30%	69.75%	69.45%	0.58
Firm 36 month change in relative ROA	71.04%	69.76%	71.95%	67.70%	0.23
Industry 12 month stock return	66.35%	69.22%	71.77%	70.02%	0.16
Industry 36 month stock return	68.34%	71.94.%	69.34%	70.74%	0.41
Industry return-on-assets (ROA)	65.98%	64.16%	73.26%	75.31%	0.00
Industry 12 month change in ROA	72.06%	66.39%	69.06%	70.91%	0.63
Industry 36 month change in ROA	67.34%	70.25%	69.85%	71.29%	0.10

Note.- Panel A reports the percentage of replacement CEOs that are executives from outside the firm for all turnover events in the indicated sample performance quartile. Figures in this panel are calculated over the subset of the 6,877 turnover observations for which we have available data for the indicated statistic. Panel B reports the percentage of all outside-of-the-firm CEO hires that were last employed in a different Fama-French 49 industry by performance quartile. Stock returns and ROA are measured as in the earlier tables and the changes in ROA are measured over the 1 year and 3 years fiscal year windows ending immediately before the observation year. Performance is converted into percentiles based on the sample-wide industry-year cohort (for relative firm performance) or year cohort (for industry performance) and then quartiles are created from the resulting percentile measures. Quartile 1 is the lowest performance quartile.

Table 7 – Coefficient Estimates from Logit Models Predicting CEO Replacement Type

	(1)	(2)	(3)
Decision Predicted In Logit Model	Outside firm vs. inside	Outside industry vs. inside, conditional	Outside industry vs. inside, uncondition.
Panel A: Firm performance variable			
Firm 12 month relative-to-industry stock return., raw	-0.371*** (0.049)	-.051 (0.077)	-0.327*** (0.052)
Firm 12 month relative stock return, percent. version	-0.825*** (0.097)	0.043 (0.164)	-0.678*** (0.104)
Firm return-on-assets (ROA) relative-to-industry, raw	-0.599*** (0.134)	0.116 (0.202)	-0.409*** (0.137)
Firm relative return-on-assets, percent. version	-0.909*** (0.097)	0.171 (0.168)	-0.684*** (0.104)
12 month change in firm ROA, percent version	-0.456*** (0.089)	-0.024 (0.148*	-0.376*** (0.095)
36 month change in firm ROA, percent version	-0.454*** (0.098)	-0.088 (0.166)	-0.399*** (0.105)
Panel B: Corresponding industry performance			
Industry 12 month stock return, raw	-0.183* (0.098)	0.149 (0.193)	-0.099 (0.140)
Industry 12 month stock return, percent. version	-0.190** (0.096)	0.212 (0.165)	-0.053 (0.106)
Industry return-on-assets (ROA), raw	-2.085*** (0.755)	1.643 (1.191)	-0.666 (0.829)
Industry return-on-assets, percent. version	-0.473*** (0.164)	0.355 (0.279)	-0.209 (0.174)
12 month change in industry median ROA, percentile	-0.194** (0.096)	0.387** (0.165)	-0.001 (0.103)
36 month change in industry median ROA, percentile	-0.220** (0.110)	-0.003 (0.187)	-0.176 (0.118)

Note.- The coefficients in Column 1 are for logit models indicating whether a replacement CEO in a turnover event is from outside the firm (dependent variable=1) or inside the firm (dependent variable=0), estimated over the subset of the 6,877 turnover events for which we have available data for the indicated statistic. Standard errors are reported in parentheses under each estimate. The coefficients in Column 2 are for logit models indicating whether a replacement outside CEO hire was last employed by a firm in a different Fama-French industry (dependent variable=1) or the same industry (dependent variable=0). The coefficients in Column 3 are for a model in which the dependent variable assumes a value of 1 for a replacement CEO from outside the industry and 0 for a replacement CEO that comes from the same industry or an inside-the-firm CEO hire. All models include controls for CEO age, an age greater than 60 dummy, tenure, year dummies, Fama French 49 industry dummies and log of inflation-adjusted firm assets (coefficients not reported). Each estimated model includes a single pair of performance variables pertaining to firm relative-to-industry performance and corresponding industry performance. The firm relative stock return raw variable (ROA level variable, change in ROA) is a residual calculated from a regression of the firm's 12 month compounded stock return (ROA, change in ROA) against the corresponding industry return (industry median ROA, industry median change in ROA) using all non-missing observations included in each logit model. The corresponding industry performance variable in these models is the predicted level of firm performance arising from industry performance. All other definitions and timing conventions are detailed in the text and notes to prior tables.
*Significant at the 10% level
** Significant at the 5% level
***Significant at the 1% level