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CEO selection as risk-taking: A new vantage on the debate about the consequences of insiders versus outsiders

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Abstract

Research Summary: Our paper sheds new light on the performance implications associated with insider versus outsider CEOs. We frame CEO selection as risk-taking, in which outsiders are relatively risky hires, with a greater tendency to generate extreme performance outcomes—either positive or negative—as compared to insiders. We base this expectation on two complementary theoretical perspectives: human capital and information asymmetry. We conduct multiple tests on large samples of CEO successions, with controls for endogeneity, and find that outsiders are indeed associated with more extreme performance outcomes than are insiders.

Managerial Summary: We shed new light on the performance implications associated with outsider CEOs. Instead of asking the customary question, "Do outsider CEOs, on average, perform better or worse than insider CEOs?," we frame CEO selection as risk-taking. Under this view, outsiders are relatively risky hires, with a greater likelihood of generating extreme performance outcomes—either positive or negative—as compared to insiders. We conduct multiple tests on large samples of CEO successions and find that outsiders are indeed associated with more extreme performance outcomes than are insiders.

1 | INTRODUCTION

In the vast literature on CEO selection, perhaps no question has been addressed more than whether outsider CEOs perform better or worse than insider CEOs. After many such inquiries, involving progressively better analytic techniques, the performance implications of outsider versus insider CEO appointments remain unclear, mixed, and apparently minor (summarized in Finkelstein, Hambrick, & Cannella, 2009). There is an enduring sense among scholars and practitioners—including boards, investors, executive search firms, and others—that the outsider–insider distinction somehow matters. As yet, however, there is little indication that it does, at least with respect to postsuccession performance levels.

We reframe this puzzle. Instead of asking whether outsiders perform better or worse than insiders, we ask: *Are outsiders riskier hires than insiders?* Conceptualizing riskiness as an increased likelihood of extremely favorable *or* extremely unfavorable outcomes (March & Shapira, 1987; Sanders & Hambrick, 2007), we posit that outsider CEOs generate more extreme performance—either positive or negative—than do insiders. As a foundation for this expectation, we draw primarily from two complementary theoretical lenses that have been widely used to examine CEO selection: human capital (Bailey & Helfat, 2003; Parrino, 1997) and information asymmetry (Zajac, 1990; Zhang, 2008).

We test our core expectation on large samples of CEO successions in U.S.-based public corporations. Applying a series of tests, including analyses that control for mean-reversion and endogeneity, we find consistent evidence that performance outcomes of outsiders are indeed more extreme than those of insiders.

Our study directs new attention to the variance, or riskiness, associated with CEO selection. In fact, with the sole exception of Bailey and Helfat (2003) (discussed below), we are not aware of any prior studies of CEO selection that have examined distributions of performance outcomes or commented on variances in such outcomes. As we discuss later, our interest in the distribution of CEO selection outcomes could be applied in various additional ways, beyond the insider–outsider distinction. Once researchers better understand the relative riskiness of different types of CEO hires, they can then explore the differences between risky hires who generate outcomes in the upper tail of the performance distribution versus those in the lower tail.

2 | THEORY

2.1 | CEO succession outcomes and the insider–outsider distinction

Over several decades, scholars have sought to understand the effects of leader replacement on organizational performance. Recognizing that leader successions represent occasions for redirection and adaptation, but also may bring disruption and trauma, researchers have explored many aspects of succession events (summarized in Finkelstein et al., 2009). As a complement to focusing on the succession event itself, some researchers have explored leader selection, asking: *Given a succession event, how do the attributes of the new leader matter?* Within this stream, the most prominent focus—by far—has been on the distinction between new CEOs who are selected from inside the organization

versus those selected from outside (e.g., Allen, Panian, & Lotz, 1979; Harris & Helfat, 1997; Huson, Malatesta, & Parrino, 2004). Researchers—depending on their own preferred theories—often selectively emphasize the advantages of one successor type over another, without fully acknowledging that each has its pros and cons. Insiders understand their organizations' specific issues, actors, and resources; but they tend to be wedded to the status quo. Outsiders bring fresh perspectives and openness to change; but they tend to be naïve about their new organizations and are prone to missteps as a result (Gouldner, 1954; Guest, 1962; Shen & Cannella, 2002).

Researchers have become progressively more sophisticated in gauging the net performance consequences of insider versus outsider CEOs. The biggest breakthrough has come from acknowledging that outsiders tend to be hired when organizations are struggling (Allen et al., 1979; Shen & Cannella, 2002). Although not uniformly so, outsiders are more frequently hired into unfavorable circumstances, where performance is poor, the executive ranks have been discredited, and the board seeks change. Conversely, insiders tend to be hired when performance is healthy, the ongoing strategy appears viable, and the board seeks continuity. When contextual conditions are controlled for, results typically show that the aggregate benefits and drawbacks of insiders versus outsiders are close to breakeven (e.g., Karaevli, 2007). For instance, Huson et al. (2004) compared matched samples of inside and outside CEO successors, based on presuccession performance levels, and ultimately found no difference in mean performance changes. In sum, despite sustained efforts by researchers to detect differences in the performance consequences of the two CEO types, findings so far have been slight.

2.2 | CEO selection as risk-taking

Theory and research on the performance consequences of CEO selection, and on the insider–outsider distinction in particular, have been stymied by two overlooked but important factors. The first is that the general relevance, or predictive validity, of observable executive attributes is largely unclear. It is exceedingly difficult, both for academics and boards, to predict who will perform well and who will perform poorly as CEO (Khurana, 2002). The CEO position is multifaceted (Mintzberg, 1973), nonprogrammable (Mintzberg, Raisinghani, & Theoret, 1976), subject to ever-shifting contextual contingencies (Henderson, Miller, & Hambrick, 2006), and not amenable to first-order learning (Hambrick & Fukutomi, 1991; Miller, 1991). Adding to the difficulty in predicting CEO effectiveness, executives possess a panoply of potentially relevant attributes, only some of which might be known or observable to hiring entities (and less so to researchers). Thus, a board might easily have less than complete information about a given candidate's values, temperament, creativity, and leadership talents—especially as these qualities pertain to a focal CEO assignment (Khurana, 2002; Zhang, 2008).

A second challenge for research on the performance implications of new leaders' attributes follows from a stream of work that is distinct from the topic of CEO selection (and rarely noted by such researchers), which has shown that CEOs generally exhibit only moderate influence, relative to contextual factors, over company outcomes. Following from the premise that organizations—and their leaders—operate under considerable inertial and institutional constraints, studies have used variance partitioning techniques on large data panels to assess the proportion of variance in performance attributable to CEOs, or "the CEO effect," as compared to environmental and organizational factors (e.g., Crossland & Hambrick, 2011; Hambrick & Quigley, 2014; Lieberson & O'Connor, 1972; Quigley & Hambrick, 2015). Although results from these studies vary somewhat, they collectively indicate that CEOs account for about one quarter of the variance in firm performance—less than the

proportion of variance explained by organizational factors but more than explained by environmental (i.e., industry) factors.

These findings have major implications for theory and research on CEO selection. For one, the aggregate CEO effect is of substantial enough magnitude to warrant the study of CEO selection consequences. At the same time, though, simply focusing on aggregate CEO effects masks deeper implications. When a variance decomposition study reports a 25% CEO effect, it means that 25% of overall variance is accounted for by factors at the CEO level, but it reveals nothing about the effects of any given, or specific, CEO on company performance. Indeed, if we use contextual factors alone to predict a CEO's expected performance, we would observe that many CEOs deliver results closely in line with such expectations, some deliver results that deviate moderately from such expectations, and yet relatively few CEOs deliver extraordinary performance—they "move the needle"—either far above or far below what contextual factors would have predicted. Thus, a fruitful path forward is to be newly alert to the possibility that many CEO successions are relatively inconsequential while a minority are highly consequential—either positively or negatively so.

As such, theory on CEO selection consequences may benefit from framing CEO selection as risk-taking, where *risk is the extent to which an action carries a substantial likelihood of generating extreme outcomes, including extreme loss* (March & Shapira, 1987; Sanders & Hambrick, 2007). From this perspective, some CEO appointees are high-variance bets, while others are low-variance bets.

2.3 | Theoretical rationale

Our expectation is that outsiders deliver more extreme performance outcomes than insiders. In conceptualizing performance outcomes, we mean change in performance relative to presuccession levels. After all, it only makes sense to judge a CEO's performance in light of what he or she inherited (Allen et al., 1979; Bailey & Helfat, 2003; Huson et al., 2004). As such, we anticipate that outsider CEOs are associated with bigger performance improvements and bigger performance declines than are insider CEOs.

We base our expectation primarily on two complementary theoretical perspectives, human capital theory, and information asymmetry theory. The human capital perspective on CEO selection is primarily concerned with how well a potential CEO's "human capital"—the set of skills, experiences, and capabilities accumulated over time by the incoming executive (Becker, 1964; Mincer, 1958)—fits with the needs of the firm (Bailey & Helfat, 2003; Chen & Hambrick, 2012; Vancil, 1987). This research has drawn on Becker's (1964) conceptualization of human capital as ranging from the generic to the specific. Generic skills are those that are most easily transferable and applicable across industries and firms, including an executive's overall leadership and strategic acumen, intelligence, and judgment. Industry-specific human capital refers to one's capabilities that are transferable across firms in a given industry, but not beyond, including one's in-depth understanding of certain technological, marketplace, and regulatory regimes. Finally, firm-specific human capital refers to one's accumulated capabilities that are solely relevant in a focal firm, including deep understanding of the firm's tacit resources, its culture, and key actors (Bailey & Helfat, 2003; Castanias & Helfat, 1991, 1992).

When a board hires an outsider CEO, the logic—explicitly or implicitly—is that firm-specific talents are not as valuable, or as necessary, as are broader industry-wide or generic executive capabilities. Indeed, a core insight of this literature is that outsiders tend to be hired when there is a need for a "fresh perspective" (Bailey & Helfat, 2003, p. 354): outsiders, even though lacking firm-specific human capital, tend to be more open-minded than insiders, as they are less likely to be cognitively

wedded to the firm's historical and current profile (e.g., Hambrick, Geletkanycz, & Fredrickson, 1993; Karaevli, 2007; Karaevli & Zajac, 2013). Also, from the human capital perspective, boards hire outsiders when they believe that no current internal executives offer a good fit for the firm's needs—that is, the internal candidates do not seem to possess the requisite broad capabilities to complement their narrower firm-specific ones (Bailey & Helfat, 2003). Boards may conclude that, in order to obtain one of the most talented executives in the industry, or one of the most talented executives in the overall world of business, they must look beyond the firm's existing ranks, as it is unlikely that an individual who is at the upper end of these human capital distributions resides within a focal firm.

When boards follow this line of thought, however, they run certain risks. Yes, they can be sure that an outsider is relatively free of any commitments to the firm's current profile, but a board can only roughly infer, or estimate, whether the outsider actually possesses the hoped-for superior transferable (generic and industry) capabilities (Bailey & Helfat, 2003; Karaevli, 2007). Moreover, in hiring outsiders who possess seemingly superior transferable talents, boards may unwisely overlook or simply miscalibrate the degree of fit between those talents and the focal firm's distinctive culture and other circumstances (Gabarro, 1987; Grusky, 1964; Kotter, 1982). This takes us to the other piece of our two-part argument.

Asymmetric information theory (Akerlof, 1970; Shen & Cannella, 2002; Zajac, 1990 ; Zhang, 2008) provides a second—and complementary—logic to account for why outsider CEOs will produce more extreme performance outcomes. According to this theory, because principal-agent (i.e., board-CEO) relations occur under conditions of uncertainty, agents are better informed than principals about the agents' true skills and capabilities, and thus principals risk selecting agents with inferior talents. Indeed, in the context of CEO selection, information asymmetry abounds when boards select external candidates. Compared to internal candidates, whom boards typically have deep familiarity with, external candidates are usually known only more superficially, by distant reputation or word-of-mouth. When hiring an outsider, then, a board is more likely to misjudge the candidates' true skill levels as well as their degree of fit with the firm's contextual circumstances, especially its culture (Zajac, 1990; Zhang, 2008).

While asymmetric information theory highlights the potential misalignment between principals and agents—and even suggests that agents will purposefully misrepresent their capabilities in the hiring process—the theory also focuses on the great costs that principals stand to bear in the forms of poor firm performance or overcompensation. Thus, according to this theory, outsiders are more likely than insiders to be—and to generate—unfavorable surprises. But the essential insight of this theory—that boards simply are not as well informed about outside candidates' capabilities as compared to insider candidates—applies irrespective of the intentions of the incoming CEO. Therefore, it also follows that outsiders similarly have a greater likelihood (than insiders) of possessing unknown *positive* qualities that could yield surprisingly outstanding performance. In short, the key distinction between the human capital approach and asymmetric information theory is that, whereas the former is mostly concerned with the question, "how much does the person know about the firm?," the latter asks the question, "how much does the board know about the person?."

When combined, the theories suggest that outsiders will generate more extreme performance outcomes than will insiders. On one hand, if the board is right when selecting an outsider—that is, that general talents are highly important to the firm's circumstances, *and* that those individuals with the greatest such talents are only available outside, *and* that the hired outsider does indeed possess those talents—then the results from hiring an outsider will tend to be outstanding (Carlson, 1961; Helmich, 1974; Helmich & Brown, 1972; Lauterbach, Vu, & Weisberg, 1999; Wiersema, 1992). On the other

hand, the foregoing theories also suggest that boards may be just as likely to miscalculate in their hiring of outsiders: they may greatly overestimate outsiders' true levels of transferable (generic and industry) human capital, and they may not be able to accurately assess how such candidates' capabilities fit with the hiring firm's needs. A misfit of this latter type may cause the new outsider CEO to fail to appreciate the firm's true strengths and limitations and, in turn, to make serious strategic, cultural, and motivational missteps (Gabarro, 1987; Grusky, 1964; Kotter, 1982). Hiring an outsider CEO could therefore bring about a steep decline in performance.

Bailey and Helfat (2003), invoking human capital theory, provided evidence related to this line of thought when they examined performance differences between two subtypes of outsider CEOs: those hired from another firm in the same industry compared to those hired from beyond the industry. In the only study (of which we are aware) that has considered distributions of postsuccession performance outcomes, the authors found that CEOs who were hired from beyond the hiring firm's industry delivered more extreme profitability outcomes than did CEOs who came from other companies in the same industry as the hiring firm. Thus, hiring outsider CEOs from afar—from outside the industry, with presumably superior general talents, but only opaquely assessed—proved to be a double-edged sword, generating more extreme losses and gains as compared to hiring outsiders from nearby. Although Bailey and Helfat's sample was very small, and did not compare insiders versus outsiders, their results provide indirect support for our arguments.

We hasten to acknowledge an additional reason why outsiders may generate bigger performance changes than insiders: outsiders may undertake more and bigger strategic and organizational changes than insiders (Helmich & Brown, 1972; Karaevli & Zajac, 2013), which in turn would heighten the likelihood of major performance changes—upward or downward. It is widely accepted that outsiders are more open-minded than insiders about making changes (Huson et al., 2004; Vancil, 1987). And outsiders may have (explicit or implicit) mandates for change (Finkelstein et al., 2009), which further propel them to undertake various types of strategic and organizational reconfigurations as compared to insiders.

In fact, it is most intriguing to assess the joint implications of this latter logic with our earlier logic. If outsiders make bigger changes than insiders, *and* if outsiders have disproportionate likelihoods to being *either* extremely capable *or* extremely incapable in their new positions, their resulting performance outcomes will tend to be extreme indeed.

3 | METHODS

3.1 | Sample and data sources

Using the Execucomp database, we constructed a core sample of 1,027 CEO successions that occurred between 2006 and 2011. Execucomp covers Standard and Poor's 1,500 firms, encompassing an array of small, midsize, and large public corporations, thus enhancing the generalizability of our findings. We ended our sample of successions in 2011 so as to observe multiple years of post-succession performance. All data came from archival sources: Execucomp, Compustat, BoardEx, and ISS, supplemented as necessary with data directly from companies' public filings.

3.2 | Measures

3.2.1 | Dependent variable: Performance change

Our outcome of interest was the degree to which a firm's performance changes under a new CEO, adjusted for the corresponding performance change in the firm's industry. The industry adjustment

controls for contextual factors beyond the influence of the CEO, allowing more accurate assessment of performance changes due to the CEO's actions. Using return on assets (ROA) as the performance indicator, which is most common in succession studies (Bailey & Helfat, 2003; Huson et al., 2004; Zhang & Rajagopalan, 2010), performance change was calculated as follows:

$$\text{Performance change}_t = (\text{Industry-adjusted firm ROA}_t) - (\text{Industry-adjusted firm ROA}_{pre})$$

where industry-adjusted firm ROA_t is the focal firm's return on assets (ROA) minus the industry median ROA in postsuccession year t, for each of the first four full years (1, 2, 3, 4) following succession, industry-adjusted firm ROA_{pre} is the average of the focal firm's industry-adjusted ROA across the 2 years prior to succession.

For instance, a firm that has ROA in year t that is two points above industry median for that year, and that had a presuccession ROA that was three points below the presuccession industry median, would have a performance change score for year t of +5.0.

We excluded the succession year from our calculations because that year's performance is due at least as much to the predecessor as the successor and often reflects accounting charges taken as the new CEO takes over (Pourciau, 1993). We examined each CEO's performance change averaged over the first four postsuccession years (or until a CEO's departure), as performance in later years is only remotely associated with succession conditions. In each year, median industry ROA was based on all firms listed in the entire Compustat database in the focal firm's 4-digit global industry classification standard (GICS4) industry designation.

3.2.2 | Independent variable: Outsider successor

In keeping with prior research (e.g., Cannella & Lubatkin, 1993; Zhang & Rajagopalan, 2010), we considered a new CEO as an *outsider* if he or she arrived at the firm within 2 years of the succession event. Of our 1,027 successors, 445 (43%) were outsiders.

3.2.3 | Control variables

As we are about to describe, we conducted multiple tests, each using progressively more complex controls. For the sake of clarity, we will describe these various controls in conjunction with their associated analyses and results.

4 | ANALYSES AND RESULTS

We conducted four discrete analyses which collectively establish the robustness of our findings. The first three analyses compared the distributions in performance changes that occurred among insiders versus outsiders, both descriptively (through histograms) and formally (through variance comparison tests). In conducting these three comparative analyses, we progressively addressed potential alternative explanations, and we appropriately reported the signed performance change scores for the various samples of outsider and insider CEOs, averaged over the four postsuccession years observed (or until CEO departure). Our final, and most rigorous, test involved a two-stage instrumental variable multiple regression analysis aimed at addressing the potential endogeneity involved in estimating the effect of outsider CEOs on performance change. Given our interest in whether outsider CEOs generate more extreme performance changes—regardless of sign—than do

FIGURE 1 Distributions of performance change scores for insider and outsider successors: Full sample

insider CEOs, to conduct this test we used a panel design involving the absolute value of performance change scores averaged over the 4 years. We now report, in turn, how we conducted each analysis and the results obtained.

4.1 | Comparison of performance change between insiders versus outsiders: Full sample

As our first test, we examined the distributions of performance change for insiders as compared to outsiders in our overall sample. Recall that these change scores are net of the change in ROA in each respective industry. Thus, even though this initial straightforward test does not consider additional covariates, it does control for industry performance, allowing intuitive insights.

Figure 1 shows histograms of performance change scores (averaged over 4 years) for insiders (top panel) and outsiders (bottom panel).[1] Both for insiders and outsiders, performance change scores were centered close to zero, or no change in the company's industry-adjusted performance. Our expectation was that the two groups differ substantially in the heterogeneity, or extremeness, of their performance outcomes. The histogram distributions in Figure 1 clearly depict that this is the case. Indeed, 45.3% of the insider CEOs exhibited performance change that fell within ± 2.0 ROA points of presuccession performance, or neutral performance. By comparison, only 24.7% of the outsider CEOs exhibited such neutral performance. Looking at the extremes, defined as outcomes that deviated by ± 6.0 ROA points, the pattern was reversed: only 27.2% of insiders exhibited such major performance changes, while 39.8% of outsiders exhibited similarly extreme performance. Furthermore, a variance comparison test (Brown & Forsythe, 1974) indicated that the standard deviation of performance change scores for outsiders (9.24) was greater than for insiders (7.08; $p < .001$; two-tailed test). Thus, this analysis of our entire sample provides initial support of our hypothesis: outsider CEOs were associated with considerably greater variance in performance change than were insider CEOs.

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[1]In all the analyses we report, we winsorized extreme values that fell outside the 3rd and 97th percentiles for the respective sample analyzed.

4.2 | Comparison of performance change: Matched pairs of insiders and outsiders

As a second analysis, we compared performance changes using matched-pair sampling. Specifically, for every case of an outsider succession, we sought to identify a "look-alike" firm—in the same industry and with approximately the same presuccession performance level—but that experienced insider succession. This matched-pair analysis controls for the confounding effects of regression to the mean, which might arise if outsiders are disproportionately hired into low-performance situations, and it pointedly controls for the possibility that industry factors might affect succession likelihoods or other succession dynamics. Our matching criteria were as follows: same GICS4 industry, same presuccession ROA (defined as within one percentage point of each other), and the same succession year. With these criteria, we identified 133 matched pairs, or 266 total succession events.

Figure 2 shows the histograms of the performance change scores for the matched-pair subsamples (insiders, top panel; outsiders bottom panel), which again clearly depict patterns in line with our hypothesis: 53.3% of insiders delivered neutral (i.e., within ± 2.0) performance changes, while only 43.6% of outsiders delivered such neutral changes. Looking at the extremes (i.e., beyond ± 6.0), only 21.1% of insiders delivered such extreme performance change versus 25.6% of outsiders. Here again, a variance comparison test indicated that the standard deviation of performance change scores for outsiders (6.18) was greater than for insiders (5.00; $p < 0.016$; two-tailed test). In sum, this matched-pair analysis also supports our hypothesis.

4.3 | Comparison of performance change: Propensity-score matched pairs

As another rigorous way to control for the apples-versus-oranges problem, or the possibility that instances of outsider succession are fundamentally different from instances of insider succession, our third analysis involved propensity-score matching (e.g., Christensen, 2016). Rather than matching only on industry and presuccession ROA, as was done in the preceding matched pair analysis, propensity-score matching entailed controlling for multiple presuccession attributes that could affect the decision to hire an outsider CEO. More specifically, this analysis involved using the propensity scores obtained from a first-stage model explaining a firm's appointment of an outsider CEO to
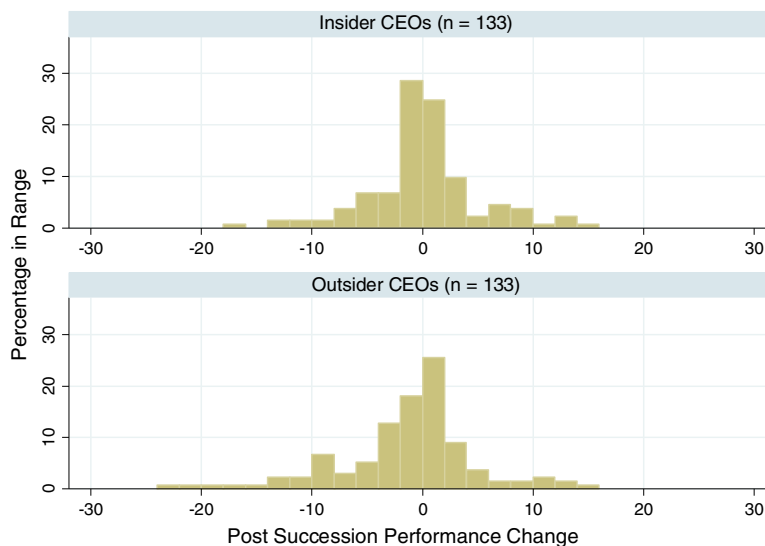

FIGURE 2 Distributions of performance change scores for insider and outsider successors: Matched samples

TABLE 1 Propensity-score matching first-stage model: Presuccession predictors of an outsider CEO[a,b]

	(1)
External candidate potential	0.24
	(0.029)
Internal candidate present	−0.67
	(0.000)
Presuccession industry-adjusted ROA	−0.02
	(0.003)
Predecessor CEO tenure	−0.46
	(0.000)
Presuccession firm size	−0.15
	(0.001)
Presuccession industry discretion	0.12
	(0.010)
Constant	0.64
	(0.420)
Observations	940

[a]p values in parentheses.

[b]Predictor variable descriptions: *potential for external candidates* was measured as the natural log of the number of firms in the focal firm's four-digit GICS industry; *presence of an internal candidate* was coded as a one if in the year prior to succession there was an executive other than the predecessor CEO with the title of chief operating officer or president, zero otherwise; *presuccession industry-adjusted ROA* was measured as the focal firm's ROA minus the industry median, averaged over the 2 years prior to succession; *predecessor CEO tenure* was measured in years as of the succession year, and was natural logged; *firm size* was measured as the natural log of net sales at the time of succession; and *presuccession industry discretion*, was measured as an index of three industry attributes known to determine managerial discretion: research and development (R&D) intensity (measured as the average of R&D divided by revenues for all firms in the industry), capital intensity (average of capital expenditures divided by sales for all firms in the industry), which was reversed since high capital intensity restricts discretion, and munificence (measured by regressing total industry sales on the trailing 5 years, and dividing the regression coefficient by average sales over the same period (Dess & Beard, 1984)). These indicators were standardized and summed to form an index.

identify pairs of firms, one with insider succession and one with outsider succession, that had roughly equal probabilities (or propensities) of outsider succession. To do so, we first specified a logistic regression on our overall sample, where the dependent variable, outsider CEO (coded as one if outsider succession occurred and zero if insider) was regressed on a selection of presuccession predictor variables (as identified from prior research on outsider succession and then pruned to only those that were significant). Table 1 shows the first-stage model specification and results (and see the footnote to Table 1 for the variable descriptions and measurements; missing data reduced our sample to 940 successions).

Based upon this first-stage model, we then identified 326 propensity-matched pairs (652 total successions) using a caliper-matching approach (caliper = ±0.10; i.e., the two firms had to have probabilities [of outsider succession] within 10 percentage points of each other), and with no replacement (i.e., there were no duplicates or replacements, all firms were unique). While our overall sample exhibited covariate bias prior to matching, the propensity-matched sample achieved suitable balance. For each covariate, we measured the standardized mean difference (difference in the means for the outsider CEO group versus the insider CEO group, scaled by the average of their standard

FIGURE 3 Distributions of performance change scores for insider and outsider successors: Propensity-score matched samples

deviations)[2] in the matched sample; the value for each covariate was well under the commonly accepted threshold of 0.1 (the largest value was 0.063) (Austin, 2011). Further, the variable ratio test, which assesses the ratio of variance in a covariate for the treated group (outsiders) over the control (insiders) group, found balance across the matched groups: Rubin's B (at 17.5) and Rubin's R (at 0.77), common measures of balance, were within recommended ranges (less than 25 for B and between 0.5 and 2.0 for R) (Austin, 2009; Busenbark, Lange, & Certo, 2017; Rubin, 2001).

Figure 3 shows the performance change scores for the propensity-matched subsamples of insiders (top panel) and outsiders (bottom panel). Here again a greater proportion of insider CEOs (42.6%) than outsider CEOs (35.0%) exhibited neutral performance change (within ±2.0); conversely, a greater proportion of outsider CEOs (35.6%) than insider CEOs (27.6%) exhibited extreme performance change (beyond ±6.0). A variance comparison test also showed that the standard deviation of performance change for outsider CEOs (9.10) was greater than for insider CEOs (8.03; $p = 0.026$; two-tailed test). In sum, this propensity-score matching analysis provides further support for our hypothesis that outsider CEOs generate more extreme performance outcomes than do insider CEOs.

4.4 | Two-stage instrumental variable regression (2SLS)

While the propensity-score matching controlled for the most relevant observable factors that predict the hiring of an outsider, the relationship between the origins of a new CEO and subsequent performance extremeness may also involve unobservable factors—for instance, internal political processes or a board's appetite for risk—any of which could be driving the results. Thus, in our final analysis, we sought to address this potential endogeneity by conducting a two-stage instrumental variable regression using the ivreg2 (2SLS) command in Stata 14.2 (e.g., Certo, Busenbark, Hs, & Semadeni, 2016; Hamilton & Nickerson, 2003). In doing so, we followed the steps outlined in previous studies for appropriately incorporating a binary endogenous variable into the estimation (Windmeijer & Santos Silva, 1997), as well as recommendations by Certo et al. (2016) to report results of an ordinary least squares (OLS) regression with robust standard errors.

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[2]The formula for standardized mean difference is: SMD = $|(\bar{x}_{treated} - \bar{x}_{matched}) / \sqrt{((S^2_{treated} + S^2_{matched})/2)}|$ where $\bar{x}$ is the sample mean and S^2 is the sample variance.

To implement the 2SLS model, we identified two predictors that could serve as instrumental variables that satisfied exclusion restrictions (Certo et al., 2016). In particular, the *presence of an internal candidate* (coded as a one if, in the year prior to succession, there was an executive other than the predecessor CEO with the title of chief operating officer or president, zero otherwise) and the *potential for external candidates* (measured as the number of firms in the focal firm's industry) served as the instruments in our analysis. While we chose both of these variables for their conceptual relevance—arguably the most important criterion for the validity of an instrument (Bushway, Johnson, & Slocum, 2007)—they also are technically suitable: both were found to be related to the independent variable (outsider successor) but not to the dependent variable (performance change) or its residuals (e.g., Certo et al., 2016; Wooldridge, 2010). These instruments were found to be appropriate based upon the three tests (underidentification, weak identification, overidentification) provided by the ivreg2 command in Stata.[3] Because our endogenous variable was binary, we followed previous research and also included the predicted values of the endogenous variable (obtained from a regression of the binary endogenous variable on the instruments and exogenous regressors) as one of the instruments in the first stage of the 2SLS regression model (Windmeijer & Santos Silva, 1997).

Table 2 reports the descriptive statistics and correlations for all variables included in the regression analysis, including the instruments, and Table 3 reports results of both the two-stage and OLS regressions (each using robust standard errors). Missing data reduced our sample to 877 successions. The first column reports the first-stage model predicting the appointment of an outside CEO. Column 2 reports the second-stage model. The results support our core expectation: outsiders are associated with more extreme performance changes than are insiders ($\beta = 0.96$, $p = 0.046$). Model 3 shows the results of the OLS regression with robust standard errors which are consistent with the 2SLS model. Though not reported here, we also repeated our analysis using the extended regression (eregress) command in Stata 15.1, which accommodates the specification of binary endogenous covariates. This model also provided consistent results (outside CEO $\beta = 0.89$, $p = 0.034$, robust standard errors).

As a robustness check (not reported here), we also performed an instrumental variable panel regression (xtivreg in Stata 14.2; robust standard errors clustered on firms) using yearly (rather than the 4-year mean) absolute performance change values and postsuccession controls. These results also supported our findings (Outside CEO $\beta = 1.04$, $p = 0.038$).

5 | DISCUSSION AND CONCLUSIONS

We shed new light on the performance implications associated with insider versus outsider CEOs. Instead of focusing on whether one of these successor types performs better or worse than the other, we frame CEO selection as risk-taking, in which outside hires are expected to be relatively riskier, with a greater tendency to generate extreme performance change—either positive or negative—as compared to inside hires. We adopt human capital and information asymmetry theories as the primary basis for this expectation, while also acknowledging that outsiders may undertake more and

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[3]The results of the tests were as follows. Underidentification: The Kleibergen-Paap rk LM statistic (24.447) rejected the null ($p = 0.0000$); Weak identification: The Cragg-Donald Wald F-statistic was 12.75 for the two instruments, which exceeded the Stock and Yogo (2002) critical value for 15% maximal bias ($p < 0.05$); Overidentification: Hansen J statistic was 2.255 ($p = 0.3238$).

TABLE 2 Correlations and descriptive statistics of multiple regression variables[a,b,c,d]

		Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	Postsuccession performance change	1.33	1.23															
(2)	Outside CEO	0.42	0.49	0.19														
(3)	Predecessor CEO tenure	1.75	0.69	-0.15	-0.21													
(4)	Presuccession industry-adjusted ROA	2.27	12.24	-0.11	-0.11	0.10												
(5)	Presuccession firm size	7.32	1.69	-0.30	-0.21	0.28	0.18											
(6)	Presuccession industry discretion	-0.19	1.61	0.19	0.08	0.03	0.19	-0.13										
(7)	Presuccession firm age	25.70	18.79	-0.20	-0.11	0.23	0.05	0.38	0.05									
(8)	Presuccession industry-adjusted *market-to-book*	1.43	1.19	0.00	-0.09	-0.03	0.17	0.02	-0.04	-0.00								
(9)	Board vigilance	0.56	1.19	-0.09	-0.08	0.07	0.04	0.26	-0.00	0.07	0.03							
(10)	Predecessor CEO on board postsuccession	0.24	0.29	-0.04	-0.07	-0.06	0.05	0.00	-0.00	-0.05	0.04	0.00						
(11)	Successor CEO duality	0.33	0.45	-0.16	-0.13	0.15	0.05	0.34	-0.02	0.31	0.03	0.06	-0.02					
(12)	Successor CEO age	52.54	6.35	-0.07	-0.02	0.07	0.02	0.14	0.01	0.12	-0.07	0.02	-0.02	0.18				
(13)	Successor CEO shareholdings (%)	0.71	0.83	0.22	-0.02	-0.12	-0.14	-0.36	-0.08	-0.17	-0.04	-0.18	0.05	-0.04	-0.13			
(14)	Successor CEO long-term equity pay (%)	0.46	0.22	-0.05	-0.08	0.14	0.14	0.31	0.13	0.12	0.12	0.09	0.01	0.15	-0.05	-0.12		
(15)	External candidate potential	6.06	0.67	0.04	0.10	-0.01	0.10	-0.17	0.21	-0.05	-0.06	0.01	0.01	-0.01	-0.01	-0.01	0.00	
(16)	Internal candidate present	0.64	0.48	-0.09	-0.17	0.14	0.00	0.08	0.06	0.05	-0.06	-0.00	0.07	0.00	0.01	-0.00	0.01	-0.04

[a]Correlations > |0.06| significant at $p < 0.05$; $n = 877$.

[b]*Presuccession controls*: We included *firm age* (years since IPO) and *firm size* (natural log of net sales) at the time of succession, as older and larger firms are more likely to have well-developed internal succession processes. Because hiring an outsider is more likely when a firm is performing poorly, we included industry-adjusted indicators of presuccession performance: *presuccession industry-adjusted ROA*, measured as the focal firm's ROA minus the industry median, averaged over the 2 years prior to succession, and *presuccession industry-adjusted market-to-book*, measured as the market-to-book value of the firm divided by the industry median, which indicates investors' estimates of the firm's prospects relative to its industry. *Board vigilance* was measured by the percentage of shares owned by independent directors in the year prior to succession (Misangyi & Acharya, 2014). *Predecessor CEO tenure* (in years, natural logged) was included, as long-tenured predecessors may have outsized influence in tapping internal successors (Zajac & Westphal, 1996). Finally, managerial discretion afforded by the industry environment might affect both CEO selection and the likelihood of extreme performance (Hambrick & Finkelstein, 1987), so we included *presuccession industry discretion*, an index of three industry attributes known to determine managerial discretion: research and development (R&D) intensity (measured as the average of R&D divided by revenues for all firms in the industry), capital intensity (average of capital expenditures divided by sales for all firms in the industry), and growth (measured by regressing total industry sales on the trailing 5 years, and dividing the regression coefficient by average sales over the same period (Dess & Beard, 1984). These indicators were standardized and summed to form an index.

[c]*Presuccession instrumental variables: external candidate potential* was measured as the ln(number of firms) in the focal firm's GICS4 industry; *internal candidate present* was coded as a one if in the year prior to succession there was an executive other than the predecessor CEO with the title of chief operating officer or president, zero otherwise.

[d]*Postsuccession controls*. Older CEOs may be less likely to undertake extreme actions, so we included *successor CEO age* (in years) at the time of succession. The successor's stock ownership and compensation arrangements could affect performance extremeness (Devers, McNamara, Wiseman, & Arrfelt, 2008), so we measured the *successor CEO's shareholdings* as the percentage of the common stock held by the CEO at the end of the fiscal year following succession, and the *successor CEO's long-term equity pay* as the proportion of total pay made up of restricted stock grants and stock option grants in the first year following succession. Predecessor CEOs who stay on the board significantly constrain successors (Quigley & Hambrick, 2012), so we included *predecessor CEO on board*, a binary variable coded to one if the predecessor CEO was on the board as of the second postsuccession year. Successor CEOs who are also given the board chair position have more latitude of action (Finkelstein & D'Aveni, 1994), so we included *successor CEO duality*, a binary indicator coded to one if the successor CEO was also board chair at the end of the year following succession. For each of these variables, we calculated the mean for the number of each CEO was present in the sample.

TABLE 3 The effect of outsider successors on postsuccession performance change: Two-stage instrumental variable regression (2SLS)

	(1)	(2)	(3)
	Stage 1 predicting outside CEO	Stage 2 predicting absolute value of postsuccession performance change	OLS predicting absolute value of postsuccession performance change
External candidate potential	0.02		
	(0.667)		
Internal candidate present	−0.06		
	(0.659)		
Predicted probability of hiring outsider	0.61		
	(0.475)		
Predecessor CEO tenure	−0.04	−0.01	−0.08
	(0.660)	(0.915)	(0.167)
Presuccession industry-adjusted ROA	−0.00	−0.01	−0.01
	(0.653)	(0.058)	(0.008)
Presuccession firm size	−0.01	−0.06	−0.09
	(0.657)	(0.123)	(0.005)
Presuccession industry discretion	0.01	0.15	0.17
	(0.690)	(0.000)	(0.000)
Presuccession firm age	−0.00	−0.01	−0.01
	(0.911)	(0.011)	(0.005)
Presuccession industry-adjusted *market-to-book*	−0.01	0.08	0.06
	(0.665)	(0.022)	(0.052)
Board vigilance	−0.01	0.00	−0.01
	(0.734)	(0.944)	(0.827)
Predecessor CEO on board postsuccession	−0.04	−0.12	−0.20
	(0.662)	(0.453)	(0.157)
Successor CEO duality	−0.03	−0.15	−0.19
	(0.696)	(0.138)	(0.054)
Successor CEO age	0.00	−0.00	−0.00
	(0.993)	(0.747)	(0.727)
Successor CEO shareholdings (%)	−0.03	0.30	0.25
	(0.656)	(0.000)	(0.000)
Successor CEO long-term equity pay (%)	−0.01	0.18	0.18
	(0.893)	(0.370)	(0.363)
Outside CEO		**0.96**	**0.31**
		(0.046)	**(0.000)**

TABLE 3 (Continued)

	(1)	(2)	(3)
	Stage 1 predicting outside CEO	Stage 2 predicting absolute value of postsuccession performance change	OLS predicting absolute value of postsuccession performance change
Constant	0.32	1.34	2.06
	(0.668)	(0.054)	(0.000)
Observations	877	877	877
F-statistic	8.20	14.08	6.65

Note: p values in parentheses; all models reported using robust standard errors.

bigger strategic changes than insiders, which in turn would amplify their performance outcomes. In support of our hypothesis, multiple analyses show that outsider CEOs are more likely to generate extreme performance outcomes, and correspondingly less likely to generate neutral outcomes, as compared to insider CEOs.

Thus, as we theorized, outsider CEOs are risky hires, who have relatively high likelihoods of generating either extremely poor or extremely good performance outcomes. It is beyond our scope to attempt to explain whether a given outsider will be in the upper tail or the lower tail of the outcome distribution but doing so should be a high priority for future research. Perhaps certain contingency factors are important (Chen & Hambrick, 2012), giving rise to conditions that cause some outsider CEOs to be especially challenged. Perhaps some boards are better than others at selecting outsider CEOs, or perhaps some search firms are better than others at screening outsider CEOs. Perhaps most promising would be to study the early strategic actions taken by outsiders, as a way to help explain which outsiders do well versus badly. As we have noted throughout, outsiders often have a mandate for change (Finkelstein et al., 2009) and tend to be cognitively and socially predisposed toward change, so examining the types and magnitudes of changes that affect the performance outcomes of outsider CEOs could be extremely illuminating.

Our findings, especially as exemplified in the performance histograms we present, reaffirm that relatively few new CEOs generate extreme outcomes. As such, researchers might ask: Did the extreme performers (a) face minimal environmental and bureaucratic constraints?, (b) receive signs from their boards that they should be bold and take risks?, or (c) enact boldness and risk-taking out of their own dispositional tendencies? The ultimate answer, which probably encompasses a mix of all three, could greatly advance understanding of the origins of managerial discretion, including an understanding of the types of CEOs who generate extreme outcomes (Hambrick & Finkelstein, 1987).

In summary, our results show that outsiders produce more extreme performance outcomes than insiders. As such, our study suggests that future research should aim for better understanding of the distribution of outcomes, or riskiness, associated with CEO selection.

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