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Are CEOs Different?

STEVEN N. KAPLAN and MORTEN SORENSEN*

ABSTRACT

Using 2,603 executive assessments, we study how CEO candidates differ from candidates for other top management positions, particularly CFOs. More than half of the variation in the 30 assessed characteristics is explained by four factors that we interpret as general ability, execution (vs. interpersonal), charisma (vs. analytical), and strategic (vs. managerial). CEO candidates have more extreme factor scores that differ significantly from those of CFO candidates. Conditional on being considered, candidates with greater general ability and interpersonal skills are more likely to be hired. These and our previous results on CEO success suggest that boards overweight interpersonal skills in hiring CEOs.

MANY EXECUTIVES ASPIRE TO BECOME CEOs. At the same time, perhaps the most important job of a board of directors is to choose an effective CEO. Yet little is known about the characteristics of executives who become CEO candidates, how CEOs differ from other top managers, and how boards choose a CEO from among those candidates. Kaplan, Klebanov, and Sorensen (2012, henceforth KKS) use personality assessments of 316 CEO candidates to study determinants of CEO success. In this study, we use a substantially larger sample that contains 2,603 assessments to further characterize top managers. Our analysis complements and extends KKS in four ways. First, using the larger sample, we identify four intuitive factors—two of which are new—that explain much of the variation in the candidates' characteristics and provide a more

*Steven N. Kaplan is with University of Chicago Booth School of Business, NBER, and CEPR. Morten Sorensen is with Tuck School of Business, Copenhagen Business School, and CEPR. We thank Geoff Smart, Randy Street, Alan Foster, and Elena Botelho of ghSMART for providing the data and for helpful discussions and comments. We thank Roland Benabou, Clifton Green, John Graham, Dan Puchniak, Laura Starks, two anonymous referees, Amit Seru, and many seminar participants for helpful comments. We also thank Donald Chi, Grace Duan, Fan Jiang, Arthur Klisz, Elaine Tang, Elyse Wummer, Emily Xiao, Stephanie Xiao, and Kan Xu for able research assistance. This research has been supported by the Fama-Miller Center, the Center for Research in Security Prices, and the Booth Initiative on Global Markets. Disclosure statement: During the previous three years, Steven Kaplan has served as a board member at Morningstar and an advisor to several private equity firms; Morten Sorensen has received financial support from the Danish Council for Independent Research ("Det Frie Forskningsråd") and the Danish Finance Institute (DFI) where he also served as a board member and executive director.

Correspondence: Steven N. Kaplan, University of Chicago Booth School of Business, 5807 South Woodlawn Avenue, Chicago, IL 60637, 773-702-4513; e-mail: skaplan@uchicago.edu.

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nuanced description of managerial personalities. Second, we show that CEO candidates are distinct from CFO and COO candidates. Third, we find that CEO candidates with greater general ability and interpersonal skills are more likely to be hired. Given the finding in KKS that interpersonal skills are unrelated to subsequent performance, this suggests that boards overweight interpersonal skills when hiring CEOs. Fourth, in an out-of-sample analysis, we find that the initially assessed characteristics predict the candidates' subsequent careers, which supports the external validity of the results. In short, we provide statistically significant predictors of who become CEOs. To the extent that a candidate's personality can be changed or improved, the results may also provide guidance for aspiring CEOs.

Large management, popular, and anecdotal literatures describe the traits, skills, and personalities of CEOs and other leaders. These literatures typically argue that CEOs differ from other executives, and they implicitly, and often explicitly, suggest the types of activities aspiring CEOs should undertake to increase their chances of becoming and succeeding as a CEO. For example, Collins (2001) claims that great CEOs have unwavering resolve, hire the right people, take blame on themselves, and are compellingly modest. George (2003) argues that leaders should "demonstrate a passion for their purpose, … establish long-term, meaningful relationships and have the self-discipline to get results." Waldman and Yammarino (1999) claim that CEOs need to be charismatic. However, Pfeffer (2015, 2016) criticizes these kinds of suggestions as "leadership BS," not describing what leaders and CEOs are actually like and instead arising from a "tendency to confuse what people believe ought to be true with what actually is." Instead, he suggests, successful leaders build their power bases, embrace ambiguity, eschew popularity contests, adapt, and master the science of influence.[1]

Similarly, finance and economics research increasingly recognizes that CEOs and other executives differ meaningfully in their skills, traits, experiences, and biases. Those differences matter, in turn, for managerial decisions and outcomes. Guenzel and Malmendier (2020) describe and summarize much of this research.

Due to the difficulty of obtaining systematic information about the abilities and personalities of a meaningful sample of executives, existing studies rely mostly on anecdotal evidence, surveys, and publicly observable characteristics, such as job tenure, college attended, and career path,[2] or they study smaller, specific samples of CEOs (e.g., 95 credit union CEOs in Colbert, Barrick, and Bradley (2014) and 32 technology firms in O'Reilly et al. (2014)).

In this paper, we study 2,603 personality assessments of candidates for top management positions. The assessments were performed by ghSMART as part of actual hiring or retention processes. Each assessment contains a detailed

[1] See also Judge et al. (2002), Mintzberg (2013), Ulrich, Smallwood, and Sweetman (2009), and Yammarino et al. (2005).

[2] Using publicly observable proxies for managerial personalities is formalized in the "Upper Echelons Theory" of Hambrick and Mason (1984) and Hambrick (2007).

description of the candidate's background and personality, including ratings for 30 specific characteristics (described in Table A.1).[3] The candidates were considered for a range of positions in the hiring companies, which include both public and private companies. Assessments were often requested by a venture capital, growth equity, or buyout investor as part of their due diligence process when evaluating an investment in a company. A majority of the candidates were considered for CEO, CFO, and COO positions.

We use factor analysis to summarize the main variation in the candidates' characteristics (see Fabrigar et al. (1999), Borghans et al. (2008), Adams, Akyol, and Verwijmeren (2018)). This empirical approach is commonly employed in personality studies, dating back to Spearman (1904). We identify four factors with intuitive interpretations: general ability, execution versus interpersonal, charisma versus analytical, and strategic versus managerial. The first two factors are similar to those in KKS in a sample of 316 CEO candidates, suggesting that these two factors describe managerial personalities more generally. The third and fourth factors are new.

We find that CEO candidates have more extreme scores on all four factors, and their personalities are distinct from those of CFO and COO candidates. CEO candidates have greater general ability, greater execution skill, more charisma, and a more strategic perspective. In contrast, the average factor scores of CFO candidates are diametrically opposite of those of CEO candidates, with the differences statistically significant.

We next investigate which candidates are hired for the position they are assessed for. Perhaps unsurprisingly, higher general ability predicts hiring for all types of candidates. For CEO candidates, interpersonal ability is also consistently predictive for being hired, which suggests that this ability is important in the CEO selection process. These results are robust across incumbents and outsiders, and across venture capital, private equity, and publicly traded companies.

One concern with the analysis above is that ghSMART's interviewers might rate CEO candidates higher on certain characteristics because they imagine that those characteristics are typical of CEO candidates or due to some inherent bias in ghSMART's assessment methodology. Alternatively, the results may be specific to the companies and investors that use ghSMART for assessments.

We address these concerns with an out-of-sample analysis. Focusing on candidates who are assessed for positions other than a CEO position ("non-CEO" candidates), we find that non-CEO candidates with personalities that resemble the typical personalities of actual CEO candidates are more likely to eventually become CEOs themselves. These non-CEO candidates become CEOs later, often in other companies, and typically through hiring processes and assessment methodologies that do not involve ghSMART.[4] Nevertheless, the candidates'

[3] Botelho and Powell (2018), building on the results in KKS and here, also use the ghSMART data to study the determinants of CEO success.

[4] Considering the full list of assessments done by ghSMART, very few candidates are assessed multiple times.

characteristics, as initially assessed by ghSMART, remain predictive for their later careers, confirming that these characteristics are informative about the candidates' inherent personalities and that these characteristics are at least somewhat stable over time. The out-of-sample analysis also supports the classification of CEO, CFO, and COO personalities, since candidates with personalities that are typical of CEOs are more likely to eventually become CEOs in recruiting processes that do not involve ghSMART. We find similar results for CFOs and COOs.

Our results add to the growing finance and economics literature that studies the personalities and characteristics of individual managers and directors. Consistent with the seminal work of Bertrand and Schoar (2003) on differences in managerial styles, we find that CEOs and other executives have different characteristics or traits. The paper most closely complements Adams, Keloharju, and Knupfer (2018), who use cognitive and noncognitive test data, measured at age 18, for Swedish men. They find that CEOs score higher on cognitive and particularly noncognitive tests than other high-caliber professionals—doctors and lawyers. They further find, as we do, that CEO ability increases with firm size. However, they do not distinguish between CEOs and other executives, nor do they distinguish among the broad range of noncognitive characteristics that we are able to study.

Graham, Harvey, and Puri (2013) administer psychometric tests to executives to elicit their attitudes toward risk, optimism, and time preferences. They find significant differences between CEOs and CFOs, and thus our results complement their findings. A strength of the Graham, Harvey, and Puri (2013) study is that they use standard measures of risk-aversion, optimism, and time preference that allow them to compare managers' personalities to personalities in the broader population. In contrast, our data contain a broader range of characteristics, and we provide a more nuanced description of managerial personalities. Moreover, unlike Graham, Harvey, and Puri (2013), our assessments are performed ex-ante, when a candidate is considered for a managerial position, which allows us to study hiring and retention decisions as well as track the candidates' subsequent career trajectories.

Green, Jame, and Lock (2019) use linguistic algorithms to measure the extraversion of executives during earnings conference calls. Extraverted CEOs and CFOs earn higher salaries. In addition, consistent with our results, extraverted CFOs are more likely to become CEOs.

Bandiera et al. (2020) apply machine learning algorithms to survey data from a large sample of CEOs and find two types of CEOs: "leaders" who conduct more high-level meetings across functions, and "managers" who conduct more individual meetings with single functions.

Other papers that find differences among executives that affect outcomes include Malmendier and Tate (2005, 2009) for overconfidence, Benmelech and Frydman (2015) for military service, Malmendier, Tate, and Yan (2011) for early life experiences, and Schoar and Zuo (2017) for the beginning of a

manager's career.[5] Adams, Akyol, and Verwijmeren (2018) find that directors' skill sets differ and that those differences are related to performance.

Our results suggesting that boards overweight interpersonal skills in their CEO hiring decisions are consistent with other papers that find evidence of similar selection bias. Hu and Ma (2020) find that venture investors are more likely to invest in startup teams that show more positivity (i.e., happy, warm, passionate), despite the fact that startup teams with those features underperform. Graham, Harvey, and Puri (2017) find that subjects rate CEO faces, particularly large-firm CEO faces, as more "competent" and less "likable" than non-CEO faces. Benson, Li, and Shue (2019) find that firms overweight sales performance in promotions for management jobs at the expense of variables that predict better managerial performance. Hoffman, Kahn, and Li (2018) find that managers who hire against recommendations from test scores end up with worse average hires. Guenzel and Malmendier (2020) review this literature, including theoretical models of behavioral biases in CEO recruiting, and provide additional examples.[6]

The paper proceeds as follows. Section I describes the sample and assessments. Section II presents the factor analysis that explores the main variation in the 30 managerial characteristics. Section III relates the factors to the executive positions and the hiring decisions. Section IV presents the out-of-sample analysis that predicts candidates subsequent career positions from their initial characteristics. Section V concludes.

I. Data

As in KKS, we use a proprietary data set with detailed assessments from ghSMART, a consulting firm that specializes in assessing top management candidates. Investors, company boards, and company management teams engage ghSMART to assess candidates for management positions. Importantly, ghSMART is not an executive recruiting firm: it does not suggest which candidate(s) to consider for a given position, it does not receive a fee contingent on whether a candidate is hired, and it has no apparent incentives to deliver biased assessments. According to ghSMART, its primary objective is to provide accurate assessments to maintain its reputation and generate repeat business. According to ghSMART, candidates willingly participate in the process and do not view the process as creating an unreasonable burden or intrusion into their privacy.

We focus on candidates for CEO, CFO, and COO positions, which constitute slightly more than half of the sample. We use CXO to denote candidates for either CEO, CFO, or COO positions, and non-CEO to denote candidates for positions other than the CEO position (similarly for non-CFO and non-COO

[5] See also Bennedsen, Pérez-Gonzalez, and Wolfenzon (2008), Colbert, Barrick, and Bradley (2014), Custodio, Ferreira, and Matos (2013), and Falato, Li, and Milbourn (2015).

[6] See also Huang, Ivković, Jiang, and Wang (2019).

candidates). ALL denotes all candidates in the sample, including candidates for positions that are neither CEO, CFO, nor COO positions.

A few assessments consider a candidate for multiple positions (e.g., as either CEO or CFO). These candidates are included in all of the corresponding categories, and thus the sum of CEO, CFO, and COO candidates slightly exceeds the number of CXO candidates.

A. Candidate Assessments

ghSMART's assessment process is based on practices developed in industrial psychology. A main part of the assessment process is a structured interview in which the interviewer[7] asks about the candidate's actions and behavior in previous jobs and life stages, starting with the candidate's childhood and progressing through the candidate's education and subsequent career. The process results in a 20- to 40-page report that describes the candidate's history and behavior, including the candidate's educational and family backgrounds. From this biography, we code whether the candidate is an internal or outside candidate, the candidate's gender, education, previous work experience, and the industry of the hiring company.

An important concern is whether candidates can "game" or "fake" the process by presenting themselves in ways that improve their chances of being hired even if they do not reflect their actual personalities. To mitigate this possibility, the ghSMART assessments are designed using best practices from organizational psychology, including using external interviewers (not self-assessments) and using extensive structured interviews (not questionnaires). In organizational psychology, these practices are associated with greater assessment validity, less susceptibility to faking and more consistency across tests and test subjects (Ones et al. (2007)). The fact that ghSMART charges more than $20,000 per assessment and has seen its business grow substantially over time suggests that ghSMART's customers value the assessments and believe they are informative. More importantly, the results in KKS and in the analyses that follow in this paper suggest that the assessments have significant out-of-sample predictive power, and hence the assessments are statistically informative.

We manually collect information from public sources to determine whether the candidates were hired for the positions for which they were assessed and to follow their subsequent careers. We rely on LinkedIn, which has very good coverage of corporate executives, as well as CapitalIQ, Zoominfo.com, LexisNexis, and Internet searches. For some candidates, we also obtain information from the buyout and venture capital investors that engaged ghSMART to assess the candidates.

[7] The ghSMART interviewers generally hold doctoral degrees or degrees from top MBA programs, and have worked at consulting firms (such as McKinsey & Co., Bain, and Boston Consulting Group). ghSMART reports a high degree of consistency of assessments across interviewers. When we include interviewer fixed effects, as indicated in the tables, the magnitude and statistical significance of the main coefficients are largely unchanged.

Table I presents summary statistics for the candidates. Panel A shows that the sample contains 2,603 assessments performed between 2000 and 2013, with all but 24 assessments conducted between 2001 and 2011. Panel B reports descriptive information about the candidates. On average, at the time of the assessment, a candidate has worked at his or her current company for 4.9 years out of a career lasting 23.5 years across 4.9 companies.

Panel C shows that 58% of the candidates are classified as Outsiders, that is external candidates who did not work for the hiring company at the time of the assessment. Insiders are classified as either Position (26% of the sample), which corresponds to candidates who worked in the position they were evaluated for, so the assessment is part of a retention process, or Company (14% of the sample), which correspond to candidates who worked for the hiring company but in a different position. Both Position and Company insiders are substantially more likely to be retained or hired than Outsiders, and since we find similar hiring practices for Position and Company insiders, we combine them into a single category—Incumbents.[8]

B. Hiring Companies

Assessment reports typically contain very limited information about the hiring companies. We manually supplement the company information with Orbis, CapitalIQ, Zoominfo.com, LexisNexis, and Internet searches. Because many of the hiring companies are private, only limited information is available. Table II presents some information about these hiring companies.

Panel A of Table II shows the distribution of ownership forms. We classify ownership as venture capital funded, growth equity funded, buyout funded, publicly traded, other private, and investor, where investor means that candidates are assessed for employment in a venture capital or private equity firm. Since they are similar, we sometimes combine the growth equity and buyout categories into a single private equity category. Hiring companies are buyout and growth equity funded for slightly more than half of the candidates. For 15% of the candidates, the hiring companies are venture capital-funded companies, and for 11% of the candidates, the hiring companies are publicly traded. A limitation of the sample is that it contains relatively few CEO candidates for public companies. Panel B of Table II shows that 79% and 9% of the candidates are considered for companies located in the United States and Canada, respectively, and that 6% are considered for companies in Europe.

Panels C and D of Table II present the size distribution of the hiring companies. We categorize size in two ways. First, we use CapitalIQ, Zoominfo.com, LexisNexis, and Internet searches to estimate the size at the time of the assessment. We categorize companies as: (i) Small, a start-up without revenue, (ii) Medium, with revenue below $100 million, (iii) Large, with revenue between

[8] Cziraki and Jenter (2020) study hiring of new CEOs in the S&P 500 and report that 72% of new CEOs are internal promotions. This suggests that outside candidates are overrepresented in our sample or that private equity firms are more likely to consider outside candidates.

Table I
Descriptive Statistics for Candidates

Panel A summarizes the 2,603 candidates assessed by ghSMART for each position by year. Panel B reports descriptive statistics for candidate characteristics. Panel C summarizes candidates by hired and incumbency, where Outsider candidates did not work for the hiring company at the time of the assessment, Company candidates worked for the hiring company in a different position, and Position candidates worked in the position they were assessed for

Panel A: Candidates Interviewed per Year

Year	CEO	CFO	COO	CXO	Other	ALL
2000	6	2	0	8	9	17
2001	35	14	10	59	37	96
2002	64	30	14	108	92	200
2003	77	21	13	111	112	223
2004	95	20	15	127	90	217
2005	79	39	16	134	105	239
2006	72	39	18	129	161	290
2007	96	48	19	163	170	333
2008	85	36	11	132	112	244
2009	70	27	9	106	119	225
2010	73	28	16	116	128	244
2011	72	33	21	125	143	268
2012	1	0	0	1	0	1
2013	0	0	0	0	6	6
Total	825	337	162	1,319	1,284	2,603

Panel B: Descriptive Statistics of Candidate Characteristics

	CEO		CFO		COO		CXO		ALL	
	Mean	*N*	Mean	*N*	Mean	*N*	Mean	*N*	Mean	*N*
Years working	24.8	802	23.7	332	23.9	156	24.4	1,286	23.5	2,511
Years current Co.	5.2	777	3.4	323	4.3	152	4.6	1,248	4.9	2,449
Number of Co.'s	5.0	807	5.2	332	5.0	156	5.1	1,291	4.9	2,515
Female	5.1%	825	8.3%	337	8.0%	162	6.3%	1,319	10.1%	2,603
Military	13.7%	810	7.2%	332	16.7%	156	12.4%	1,294	12.4%	2,524
Insider	45.4%	812	27.2%	334	52.8%	159	41.7%	1,301	41.2%	2,571
Hired	59.4%	798	53.7%	328	72.0%	157	59.4%	1,278	59.4%	2,427

Panel C: Incumbency and Hired Candidates

	Not Hired		Hired		N/A	Total
Outsider	801	53.0%	610	40.8%	100	1,511
Company	60	16.1%	300	80.7%	12	372
Position	116	16.9%	518	75.3%	54	688
N/A	9	28.1%	13	40.6%	10	32
Total	986	37.9%	1,441	55.4%	176	2,603

Table II
Description of Companies

For the candidates assessed by ghSMART, Panel A summarizes the distribution of the hiring companies classified by ownership type. Panel B summarizes the distribution of hiring companies by location. Panel C summarizes the distribution of hiring companies by size from public sources, where Small = companies without revenue, Medium = revenue below $100 million, Large = revenue between $100 million and $1 billion, and Very Large = revenue above $1 billion. Panel D summarizes the distribution of company size from Orbis where Small = companies with revenue less than $1 million, Medium = revenue between $1 million and $13 million, Large = revenue between $13 million and $130 million and Very Large = revenue above $130 million.

Panel A: Hiring Company Type

	CEO		CFO		COO		CXO		ALL	
Venture capital	23%	187	13%	45	14%	22	19%	254	15%	396
Growth equity	13%	106	17%	56	24%	39	15%	201	13%	326
Buyout	53%	437	55%	185	44%	72	52%	690	45%	1,178
Public	3%	28	3%	11	9%	14	4%	53	11%	289
Other private	6%	53	8%	27	8%	13	7%	92	8%	211
Investor	1%	11	4%	13	1%	2	2%	26	8%	198
N/A	0%	3	0%	0	0%	0	0%	3	0%	5
Total	100%	825	100%	337	100%	162	100%	1,319	100%	2,603

Panel B: Hiring Company Location

	CEO		CFO		COO		CXO		ALL	
USA	81%	668	85%	288	84%	136	82%	1,088	79%	2,064
Canada	8%	65	4%	15	6%	9	7%	88	9%	235
Europe	3%	21	4%	15	7%	11	4%	47	6%	165
Japan	0%	1	0%	0	0%	0	0%	1	0%	3
N/A	8%	70	6%	19	4%	6	7%	95	5%	136
Total	100%	825	100%	337	100%	162	100%	1,319	100%	2,603

Panel C: Hiring Company Size (from Public Sources)

	CEO		CFO		COO		CXO		ALL	
Small	24%	202	13%	43	17%	28	135%	272	16%	425
Medium	35%	292	41%	139	44%	72	247%	499	31%	818
Large	14%	116	23%	76	9%	14	102%	206	17%	433
Very large	9%	78	11%	37	15%	25	69%	140	18%	475
N/A	17%	137	7%	42	14%	23	124%	250	17%	452
Total	100%	825	94%	337	100%	162	677%	202	100%	2,603

Panel D: Company Size (Orbis)

	CEO		CFO		COO		CXO		ALL	
Small	6%	46	6%	21	6%	9	6%	76	5%	129
Medium	17%	139	19%	65	22%	36	18%	238	16%	419
Large	22%	184	22%	74	19%	30	22%	286	19%	483
Very large	34%	277	40%	134	41%	66	36%	477	43%	1,122
N/A	22%	179	13%	43	13%	21	18%	242	17%	450
Total	100%	825	100%	337	100%	162	100%	1,319	100%	2,603

$100 million and $1 billion, and (iv) Very Large, with revenue above $1 billion. Second, we use the Orbis database, which classifies companies with revenue of more than $130 million as Very Large, more than $13 million as Large, more than $1 million as Medium, and less than $1 million as Small. A limitation of Orbis is that it does not contain historical information that is more than five years old, and it does not have information dated at the time of the assessments. However, an advantage of Orbis is that it provides the current size of the hiring company. We classify candidates for investors separately.

The distributions in Panels C and D of Table II suggest that the sample contains a reasonable balance of hiring companies across size classifications. Across CEO, CFO, and COO candidates, between 34% and 41% of the candidates are from companies that Orbis now classifies as Very Large. Overall, we believe the sample provides broad coverage of candidates for a reasonable range of company sizes and corporate ownership forms.

C. Subjective Perception of Candidates

Research assistants (RAs) manually coded the assessments. The RAs read the assessments, transcribed the ratings from the reports, and coded the candidates' subsequent careers.

Additionally, the RAs were asked to rate their subjective perception of the candidate. The RAs rated whether the candidate seemed like a nice person, a risk-taker, outgoing or reserved, whether the candidate appeared to be good at sales, and whether the candidate had a narrow or broad career path before the assessment. We did not provide the RAs with precise guidelines or definitions—the subjective ratings simply give an indication of one's immediate perception of a candidate's personality. Given the subjective nature of these ratings, they are not used in the main analysis. Nevertheless, they are useful in confirming our interpretation of the four factors.

Panel A of Table III reports the RAs' subjective ratings. They rate 78% of the candidates as nice persons, 58% as risk-takers, 74% as having outgoing personalities, 65% as good at sales, and 35% as having had broad careers. Compared to CFO candidates, CEO candidates are perceived as risk-takers, as outgoing, as being good at sales (p-values $< 1\%$),[9] and as having had broader career paths (p-value of 1.9%).

Panel B of Table III reports the subjective ratings across hiring companies with different ownership forms. In general, venture capital-funded companies are more likely to consider risk-takers and candidates with broader careers (p-values of 1.3% and $<1\%$). Candidates considered by private equity-owned companies are more likely to be perceived as nice persons (p-value of 6%),

[9] Unless otherwise stated, reported p-values are from two-sided, unpaired t-tests of the null hypothesis that the ratings of the specified characteristics are equal for the indicated candidates. In this particular case, we separately test the three null hypotheses that CEO and CFO candidates have identical ratings for risk-taker, outgoing personality, and being good at sales, and all three hypotheses are rejected with p-values $< 1\%$.

Table III
Subjective Ratings

For each candidate assessed by ghSMART, the panels show the distribution of the research assistants' subjective perception of the candidate as a nice person, a risk-taker, outgoing, good at sales, and having a broad career path.

Panel A: Subjective Rating by Position

	CEO	CFO	COO	CXO	ALL
Nice person	77%	76%	79%	77%	78%
Risk-taker	64%	48%	58%	59%	58%
Personality	79%	68%	73%	76%	74%
Good at sales	79%	34%	62%	67%	65%
Career path	40%	33%	37%	38%	35%

Panel B: Subjective Rating by Ownership Type, All Candidates

	VC	PE	Public	ALL
Nice person	76%	79%	79%	78%
Risk-taker	64%	58%	55%	58%
Personality	72%	77%	64%	74%
Good at sales	66%	65%	66%	65%
Career path	44%	37%	26%	35%

Panel C: Subjective Rating by Ownership Type, CEO Candidates

	VC	PE	Public	ALL
Nice person	77%	78%	71%	77%
Risk-taker	70%	62%	68%	64%
Personality	76%	81%	78%	79%
Good at sales	77%	79%	77%	79%
Career path	46%	39%	43%	40%

Panel D: Subjective Rating by Gender

	Female	Male	Female CEO	Male CEO
Nice person	82%	78%	72%	77%
Risk-taker	52%	59%	70%	64%
Personality	70%	74%	79%	79%
Good at sales	56%	66%	85%	79%
Career path	34%	35%	41%	40%

as having outgoing personalities (p-value $< 1\%$), and as having had broader careers (p-value of 2.3%). Public companies are less likely to consider candidates perceived as having outgoing personalities and with broad career paths (p-values $< 1\%$).

Panel C focuses on CEO candidates. Perhaps unsurprisingly, compared to the average candidate, CEO candidates for venture capital-backed companies are greater risk-takers (p-value of 7.9%) with broader careers (p-value of 9.4%).

Perhaps more surprisingly, CEO candidates for private equity-backed companies are perceived to be nicer persons (p-value of 6.8%) and as less risk-taking (p-value of 8.5%) than the average CEO candidate.

Finally, Panel D of Table III compares male and female candidates. Female candidates are rated as significantly less risk-taking (p-value of 4.4%) and as less good at sales (p-value $<$ 1%). In contrast, focusing on CEO candidates, these differences reverse: female CEO candidates are perceived as greater risk-takers and as better at sales than male CEO candidates, although these differences are not statistically significant, which may be due to the small number of female CEO candidates in our sample.

We also compare candidates with and without MBA degrees and candidates who did and did not attend a prestigious college.[10] Candidates with MBAs are perceived as significantly less nice (p-value of 3.9%), as significantly more likely to take risk (p-value of 7.3%), and as having had significantly broader career paths (p-value of 1.7%). Candidates from prestigious colleges are perceived as having significantly less outgoing personalities (p-value of 1.7%).

II. The Four Factors

ghSMART grades each candidate on 30 specific characteristics, grouped into five general areas:[11] Leadership, Personal, Intellectual, Motivational, and Interpersonal. Table A.1 describes the characteristics and provides ghSMART's internal guidelines for behaviors that result in higher and lower grades. Characteristics are graded from D (lowest) to A+ (highest), depending on the extent to which the candidate's personality reflects the particular characteristic. We convert letter grades to numerical ratings using the traditional scale. An "A" grade is coded as 4, "B" is coded as 3, and so on. The "+" and "–" modifiers add and subtract 0.3, so "A+" is coded as 4.3. Our results are robust to other coding schemes, such as giving a relatively larger score to the highest grades.

Table IV reports average ratings for the characteristics. The ratings are similar across positions, with CFOs scoring slightly lower, on average. The ratings are highly correlated across characteristics, however, and it is not possible to include all of them as explanatory variables in a multivariate regression due to multicollinearity. Therefore, like KKS, we use factor analysis to identify the underlying variation in the characteristics.

[10] We classify prestigious colleges as those considered "Ivy League Plus:" Brown University, Cambridge University (UK), Columbia University, Cornell College, Dartmouth College, Duke University, Harvard University, Oxford University (UK), Princeton University, Stanford University, University of Pennsylvania, University of Chicago, Wharton College, and Yale University.

[11] Ratings for one of the 30 characteristics are missing for a few candidates. Instead of omitting those candidates from the analysis, we augment the data by estimating the missing rating using an OLS regression with the ratings for the other characteristics as explanatory variables.

Table IV
Average Characteristic Ratings

The table presents the average characteristic ratings of the 2,603 candidates assessed by ghSMART by the candidate's position.

	CEO	CFO	COO	CXO	ALL
Hires A-players	3.28	3.21	3.34	3.27	3.26
Develops people	3.32	3.24	3.35	3.30	3.30
Removes underperformers	3.17	3.08	3.19	3.15	3.14
Respect	3.54	3.54	3.59	3.55	3.56
Efficiency	3.55	3.49	3.63	3.55	3.56
Network	3.50	3.27	3.40	3.43	3.43
Flexible	3.46	3.37	3.43	3.43	3.43
Integrity	3.86	3.88	3.92	3.87	3.88
Organization	3.51	3.61	3.66	3.55	3.55
Calm	3.62	3.53	3.59	3.59	3.57
Aggressive	3.62	3.35	3.53	3.54	3.52
Fast	3.60	3.41	3.56	3.54	3.53
Commitments	3.72	3.64	3.73	3.70	3.71
Brainpower	3.60	3.55	3.58	3.59	3.57
Analytical skills	3.51	3.60	3.52	3.53	3.51
Strategic vision	3.42	3.15	3.19	3.32	3.28
Creative	3.54	3.18	3.35	3.42	3.43
Attention to detail	3.38	3.56	3.58	3.45	3.46
Enthusiasm	3.60	3.29	3.53	3.51	3.51
Persistence	3.76	3.59	3.72	3.71	3.72
Proactive	3.72	3.46	3.65	3.64	3.63
Work ethic	3.84	3.73	3.86	3.81	3.81
High standards	3.63	3.51	3.62	3.59	3.61
Listening skill	3.45	3.42	3.50	3.45	3.47
Open to criticism	3.31	3.38	3.41	3.34	3.37
Oral communication	3.57	3.36	3.49	3.51	3.50
Teamwork	3.49	3.45	3.54	3.48	3.49
Persuasion	3.56	3.22	3.42	3.46	3.44
Holds people accountable	3.46	3.34	3.44	3.43	3.41
Average	3.54	3.43	3.53	3.51	3.51

Panels A and B of Table V report the results of the factor analysis.[12] Panel A presents factor loadings for the first four factors.[13] Panel B presents eigenvalues and the variation explained by the first six factors. A factor is considered valid if its eigenvalue exceeds one. The first four factors are valid and together explain 51.2% of the variation in the characteristics.

[12] The term factor analysis is used to describe a range of statistical procedures, including procedures that are also known as principal component analysis. Our estimates are produced using Stata's "factor" command with the "ml" and "altdivisor" options. The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.94, indicating that the data are well suited for factor analysis.

[13] The factor loadings are non-rotated. Signs and magnitudes of factor loadings are unidentified and cannot be interpreted. Mathematically, a factor is a vector that is identified up to scale and sign. A factor classifies characteristics that tend to vary together and defines a scale that measures this covariation, but the scale itself is arbitrary.

Table V
Factor Loadings

Panel A presents factor loadings for the four first factors based on the characteristic ratings from 2,603 candidate assessments by ghSMART. Loadings with an absolute value less than 0.15 are left blank. Panel B shows eigenvalues and variation explained by the first six factors. Panel C shows pairwise correlations between factor scores, gender, and subjective ratings. By construction, factors are orthogonal, and, thus, their correlations are omitted. In Panel C, statistical significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Factor Loadings (|loadings| < 0.15 are Blank)

	Factor 1	Factor 2	Factor 3	Factor 4
Hires A-players	0.59			
Develops people	0.56	0.25		
Removes underperformers	0.53	−0.17		−0.22
Respect	0.31	0.73		
Efficiency	0.71			−0.22
Network	0.64			
Flexible	0.54	0.38		
Integrity	0.30	0.31		
Organization	0.50		0.44	−0.23
Calm	0.44	0.33		
Aggressive	0.68	−0.43	−0.26	
Fast	0.69	−0.37	−0.18	
Commitments	0.70			−0.21
Brainpower	0.52		0.33	0.43
Analytical skills	0.54		0.56	0.25
Strategic vision	0.58	−0.16		0.46
Creative	0.52			0.39
Attention to detail	0.40		0.46	−0.27
Enthusiasm	0.55	0.24	−0.44	
Persistence	0.66	−0.16		
Proactive	0.74	−0.26	−0.20	
Work ethic	0.57			
High standards	0.73	−0.17		
Listening skill	0.39	0.62		
Open to criticism	0.41	0.65		
Oral communication	0.49	0.16	−0.16	0.19
Teamwork	0.48	0.61		
Persuasion	0.60		−0.37	0.18
Holds people accountable	0.66	−0.21		−0.27

Panel B: Eigenvalues and Variance Explained by First Six Factors

	Eigenvalue	Proportion	Cumulative
Factor 1	9.34	32.2%	32.2%
Factor 2	2.88	9.9%	42.1%
Factor 3	1.51	5.2%	47.3%
Factor 4	1.12	3.9%	51.2%
Factor 5	0.85	2.9%	54.1%
Factor 6	0.42	1.4%	55.5%

(*Continued*)

Table V—*Continued*

Panel C: Pair-Wise Correlation Coefficients

	Nice Person	Risk Taker	Outgoing Personality	Good at Sales	Career Path	Female
Nice person	1.00					
Risk-taker	−0.17***	1.00				
Personality	0.01	0.15***	1.00			
Good at sales	0.04*	0.11***	0.16***	1.00		
Career path	−0.05**	0.10***	0.04**	0.00	1.00	
Female	0.03	−0.04**	−0.03	−0.07***	−0.01	1.00
Factor 1 (+Ability)	0.17***	0.18***	0.10***	0.29***	0.01	0.02
Factor 2 (–Execution)	0.55***	−0.24***	−0.02	−0.05**	−0.05**	0.03
Factor 3 (–Charisma)	−0.06***	−0.16***	−0.21***	−0.26***	−0.06***	−0.02
Factor 4 (+Strategic)	0.00	0.07***	0.05***	0.12***	0.04*	−0.08***

A. Factor Interpretations

The four factors have natural interpretations. Panel A of Table V shows that the first factor has positive loadings on all characteristics, and Panel B shows that it explains 32.2% of the variation in the characteristics. We interpret this factor as a candidate's general ability.[14] This structure reflects a general tendency of the characteristics to move together, which is common in personality studies, dating back to the "*g* factor" identified by Spearman (1904). The loadings on the first factor range from a 0.30 on Integrity to 0.74 on Proactive. Note that the different magnitudes do not indicate that Proactive is more important, in some sense, than Integrity. Formally, the relative magnitudes mean that for candidates with greater scores on the first factor, that is, candidates with greater general ability, this general ability manifests itself more strongly in their ratings on Proactive than on Integrity.

The second factor explains 9.9% of the total variation and has two distinct sets of factor loadings. Its positive loadings, in decreasing order, are for the characteristics Treats People with Respect, Open to Criticism, Listening Skills, and Teamwork. These characteristics appear to reflect candidates' interpersonal skills. The second factor loads negatively on Aggressive, Fast, Proactive, and Holds People Accountable, characteristics that arguably reflect a candidate's execution ability. Thus, the second factor distinguishes candidates with greater interpersonal skills from those with greater execution ability. Candidates with greater interpersonal skills have positive scores on this factor, and candidates with greater execution ability have negative scores. The prominence of this factor is consistent with Rotemberg and Saloner (1993) and

[14] The pattern would also be consistent with some of ghSMART's interviewers generally rating candidates higher or lower, but the results are largely unchanged when we include interviewer fixed effects.

Bolton, Brunnermeier, and Veldkamp (2013), who analyze the tension between resolute and overconfident managers versus managers with empathy and interpersonal skills in their models of CEO types.

The third factor explains 5.2% of the variation. Panel A of Table V shows that it loads more negatively on Enthusiasm, Persuasion, Aggressive, Proactive, and Fast, which arguably describe more charismatic personalities, while it loads more positively on Analytical Skills, Attention to Detail, Organization, and Brainpower, which describe more analytical personalities. Thus, the third factor appears to distinguish candidates with more charismatic personalities (negative factor scores) from candidates with more analytical personalities (positive factor scores).

Finally, the fourth factor explains 3.9% of the variation. It loads more positively on Strategic Vision, Brainpower, Creative, and Analytical Skills, and more negatively on Holds People Accountable, Attention to Detail, Organization, Efficiency, and Removes Underperformers. We interpret this factor as assigning positive scores to candidates with a broader and more strategic focus, and negative scores to candidates with greater attention to detail and more managerial personalities.

Panel C of Table V shows pairwise correlations between the candidates' factor scores, their gender, and the RAs' subjective ratings of the candidates' personalities. Note that the factors are orthogonal by construction, so their pairwise correlations are zero and thus are not reported.

Candidates who the RAs perceive as nice have significantly higher general ability (factor 1), have greater interpersonal skills (positive factor 2), and are more charismatic (negative factor 3). This relationship is particularly strong for the second factor, which is consistent with our interpretation of this factor as reflecting interpersonal skills. Candidates perceived as more risk-taking have significantly higher general ability (factor 1), execution ability (negative factor 2), charisma (negative factor 3), and strategic focus (positive factor 4). Candidates perceived as having outgoing personalities have higher general ability (factor 1), charisma (negative factor 3), and strategic focus (factor 4). The negative correlation with factor 3 is particularly strong, which is consistent with our interpretation of this factor as reflecting a candidate's charisma. Candidates perceived to be good at sales have more general ability (factor 1), execution ability (negative factor 2), charisma (negative factor 3), and strategic focus (factor 4). Overall, the RAs' subjective perceptions of the candidates' personalities appear consistent with the interpretations of the factors based on the factor loadings on the individual characteristics.

Panel C of Table V also compares female and male candidates. Female candidates have more managerial personalities, that is, display greater attention to detail (negative factor 4) and are less likely to be perceived as risk-takers and good at sales. Although these correlations are statistically significant, they are economically small, with none of the correlations exceeding 0.08 in magnitude. The correlations between the female candidates' other factor scores and the RAs' subjective ratings are statistically insignificant and economically small.

Overall, female candidates do not appear to be appreciably different from male candidates.

In the Internet Appendix, we also examine the factor scores for candidates with and without MBA degrees and those from prestigious colleges, as defined previously.[15] Candidates with MBAs have higher general ability (higher factor 1, p-value of 1.1%), more execution ability (negative factor 2, p-value of 6.5%), more analytical personalities (positive factor 3, p-value $< 1\%$), and greater strategic focus (positive factor 4, p-value $< 1\%$). Candidates who have attended prestigious colleges are similar. Compared to other candidates, they also have greater general ability (higher factor 1, p-value $< 1\%$), more execution ability although not statistically significantly so (negative factor 2, p-value of 10.6%), more analytical personalities (positive factor 3, p-value $< 1\%$), and a more strategic focus (positive factor 4, p-value $< 1\%$).

B. Relative Factor Scores

Factor scores are relative scores within the sample. For each factor, the average score in the sample is zero. One implication is that while CFOs score lower than CEOs on general ability, this does not imply that CFOs have low general ability relative to the broader population. Adams, Keloharju, and Knupfer (2018) suggest that top executives as a group have above-average ability.

Moreover, when one group scores higher than another—for example, CEOs score higher than CFOs on general ability, execution, charisma, and strategic focus—these scores should be interpreted relative to the sample averages. For this interpretation, it is important that a substantial part of the sample consists of non-CXO candidates (i.e., candidates who are considered for neither CEO, CFO, nor COO positions). These candidates serve as a broader control group. To illustrate, if the sample had consisted solely of CEO and CFO candidates, then mechanically for every factor for which CEOs have a positive score, on average, CFOs would have a negative score. The number of non-CXO candidates in the sample mitigates this concern.

III. CEO, CFO, and COO Characteristics

A. Factor Scores of All Candidates

Figure 1 and Panel A of Table VI show that, for each of the factors, the average scores of CEO and CFO candidates have opposite signs. In both panels of Figure 1, CEOs are in the upper left quadrant and CFOs are in the lower right quadrant. CEO candidates have more general ability (factor 1), execution ability (negative factor 2), charisma (negative factor 3) and strategic focus (factor 4). Conversely, CFO candidates have less general ability, but are more interpersonal (factor 2), are particularly analytical (factor 3), and have more

[15] The Internet Appendix is available in the online version of this article on *The Journal of Finance* website.

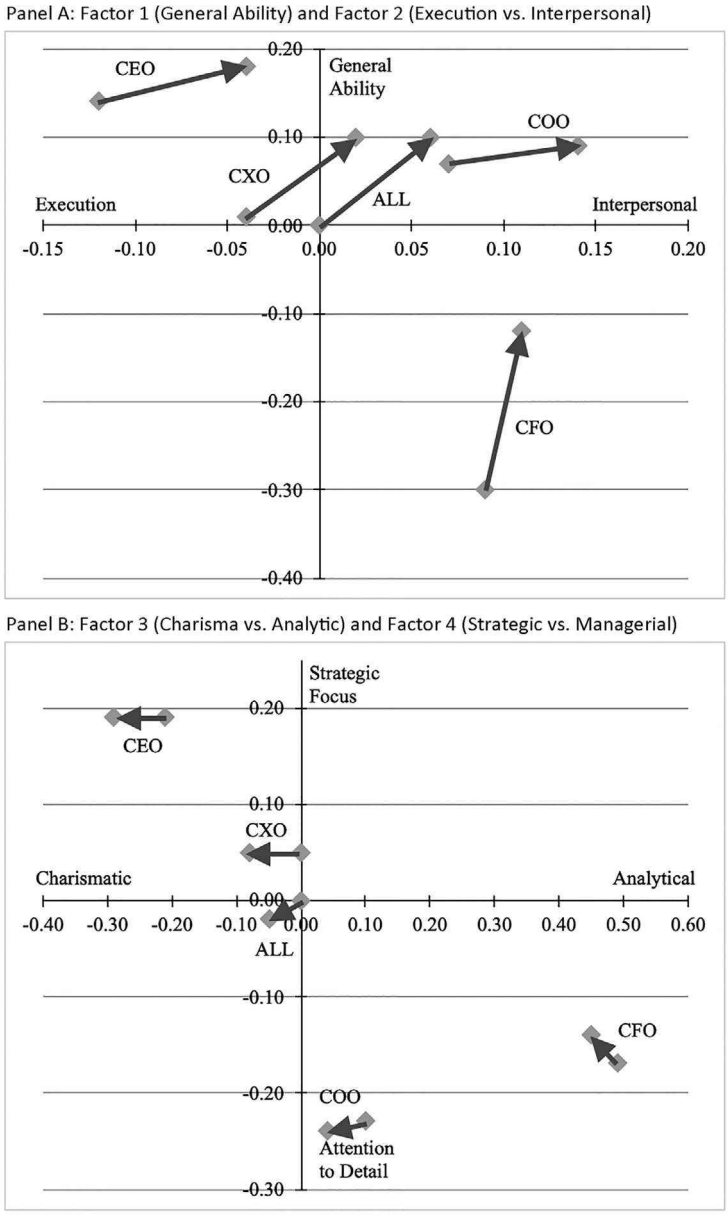

Figure 1. Interviewed versus hired. Panels A and B show average factor scores for 2,603 candidates assessed by ghSMART for ALL, CEO, CFO, COO, and CXO positions. For each position, the arrow starts at the point representing the average factor scores of all the assessed candidates for this position and ends at the point representing the average factor scores of the hired candidates. Panel A shows factors 1 (general ability) and 2 (execution vs. interpersonal). Panel B shows factors 3 (charismatic vs. analytical) and 4 (strategic vs. managerial).

Table VI
Factor Scores by Position

The panels present average factor scores for candidates assessed or hired for the indicated positions from 2,603 candidate assessments by ghSMART. Panel A shows factors scores for all assessed candidates. Panel B shows candidate factor scores by ownership type of the hiring company, Panel C shows candidate factor scores by the size of the hiring company as obtained from public sources, and Panel D shows factor scores for candidates who are hired.

Panel A: Factor Scores

	CEO	CFO	COO	CXO	ALL
Factor 1 (+Ability)	0.14	−0.30	0.07	0.01	0.00
Factor 2 (–Execution)	−0.12	0.09	0.07	−0.04	0.00
Factor 3 (–Charisma)	−0.21	0.49	0.10	0.00	0.00
Factor 4 (+Strategic)	0.19	−0.17	−0.23	0.05	0.00

Panel B: Factor Scores by Ownership Type

Venture Capital	CEO	CFO	COO	CXO	ALL
Factor 1 (+Ability)	0.04	−0.27	0.01	−0.02	−0.02
Factor 2 (–Execution)	−0.19	−0.12	0.18	−0.14	−0.11
Factor 3 (–Charisma)	−0.32	0.58	0.25	−0.11	−0.14
Factor 4 (+Strategic)	0.42	−0.25	−0.24	0.25	0.19
Private Equity	**CEO**	**CFO**	**COO**	**CXO**	**ALL**
Factor 1 (+Ability)	0.18	−0.33	0.10	0.03	−0.05
Factor 2 (–Execution)	−0.07	0.12	0.10	0.00	0.03
Factor 3 (–Charisma)	−0.22	0.46	−0.05	−0.01	−0.07
Factor 4 (+Strategic)	0.09	−0.18	−0.29	−0.03	−0.06
Public	**CEO**	**CFO**	**COO**	**CXO**	**ALL**
Factor 1 (+Ability)	0.40	0.37	0.26	0.36	0.37
Factor 2 (–Execution)	−0.12	0.12	−0.03	−0.04	−0.02
Factor 3 (–Charisma)	0.50	0.57	0.37	0.48	0.30
Factor 4 (+Strategic)	0.16	−0.10	−0.24	0.00	−0.08

Panel C: Factor Scores by Size of Hiring Company (from Public Sources)

Small or Medium	CEO	CFO	COO	CXO	ALL
Factor 1 (+Ability)	0.07	−0.39	−0.06	−0.06	−0.08
Factor 2 (–Execution)	−0.09	0.04	0.13	−0.03	0.01
Factor 3 (–Charisma)	−0.28	0.50	0.06	−0.05	−0.11
Factor 4 (+Strategic)	0.24	−0.21	−0.27	0.07	0.02
Large or Very Large	**CEO**	**CFO**	**COO**	**CXO**	**ALL**
Factor 1 (+Ability)	0.33	−0.20	0.29	0.15	0.13
Factor 2 (–Execution)	−0.20	0.11	−0.16	−0.10	−0.02
Factor 3 (–Charisma)	−0.06	0.45	0.17	0.14	0.14
Factor 4 (+Strategic)	0.06	−0.06	−0.13	0.00	−0.06

(*Continued*)

Table VI—*Continued*

Panel D: Factor Scores of Hired Candidates					
	CEO	CFO	COO	CXO	ALL
Factor 1 (+Ability)	0.18	−0.12	0.09	0.10	0.10
Factor 2 (–Execution)	−0.04	0.11	0.14	0.02	0.06
Factor 3 (–Charisma)	−0.29	0.45	0.04	−0.08	−0.05
Factor 4 (+Strategic)	0.19	−0.14	−0.24	0.05	−0.02

managerial personalities and greater attention to detail (negative factor 4). These differences are clearly statistically significant (all p-values $< 1\%$). The differences in CEO and CFO personalities, particularly for factors 2 and 3, are consistent with Graham, Harvey, and Puri (2013), who find that CEOs are more optimistic and risk-tolerant than CFOs.

For COO candidates, the factor scores fall between those of CEO and CFO candidates except for factor 4 for which COOs score lower than both CEO and CFOs, consistent with COO candidates having more managerial personalities and displaying greater attention to detail. The differences in factor scores between COOs and CEOs are statistically significant for factors 2, 3, and 4. The differences between COOs and CFOs are statistically significant for factors 1 and 3.

Panel B of Table VI reports the average factor scores by company ownership, classified as venture capital, private equity (either growth equity or buyout), and public companies. Across ownership forms, CEOs tend to have more general ability (factor 1), execution ability (negative factor 2), and strategic focus (factor 4) than other candidates, but the levels vary across ownership types. Candidates for public companies have more general ability (factor 1) and are more analytical (factor 3) than candidates for venture capital and private equity-backed companies. This pattern is consistent with Rosen (1981) and Gabaix and Landier (2008), who argue that larger companies should employ more talented managers.

CEO candidates for venture capital-backed companies, typically entrepreneurial start-ups, seem to be more extreme than other CEO candidates. They have the least general ability (factor 1), but the greatest execution ability (negative factor 2), the most charisma (negative factor 3), and the most strategic focus (factor 4), with these differences all statistically significant.

Panel C of Table VI presents scores by firm size. We use the size measure based on the estimated company size at time of hiring from public sources. We report factors separately for firms below $100 million in revenue—Small or Medium firms—and firms above $100 million—Large or Very Large firms. CEO candidates in both groups have above average general ability and execution skills. CEO candidates of smaller firms have above-average charisma and strategic focus. Although CEOs of larger firms also score above-average on these factors, the magnitudes are smaller. CFO candidates in both smaller and larger firms score very high on analytical ability but have lower general and

execution abilities and score below average on strategic focus. CEO and CFO candidates considered for larger companies have significantly greater general ability than candidates considered for these positions for smaller companies (p-value $< 1\%$ and 4.0%). Overall, the factor patterns are largely similar, though not identical, across different firm sizes.

B. Factor Scores of Hired Candidates

The average factor scores of hired candidates are shown in Panel D of Table VI. The differences in factor scores between assessed and hired candidates are illustrated by the arrows in Figure 1. Relative to candidates overall, hired candidates score higher on general ability (factor 1), have greater interpersonal (lower execution) skills (factor 2), and are more charismatic (negative factor 3), with p-values $< 1\%$.

Focusing on CEOs, there is no statistical difference in the fourth factor between CEO candidates who are hired versus not, but the scores are significantly different for the three other factors. Relative to other CEO candidates, the hired CEO candidates have significantly greater general ability (factor 1, p-value of 4.7%), greater interpersonal (and less execution) skill (positive factor 2, p-value $< 1\%$), and more charisma (negative factor 3, p-value $< 1\%$).

Panel A of Table VII presents probit estimates where the hiring decision is the dependent variable. Except for COOs, more general ability (factor 1) is a statistically significant predictor of a candidate being hired. For COOs, the point estimate is positive but insignificant, possibly due to the smaller number of COO candidates.

Comparing Panels B and C of Table VII shows that general ability is particularly important for outside candidates. To illustrate the magnitudes of the estimated coefficients, the marginal effect of a one-standard-deviation increase in general ability (factor 1) for an outside CEO candidate is 9.1%, which increases the probability of being hired from 43.1% to 52.2%. For an outside CFO, this marginal effect is even larger at 20.7%, which increases the hiring probability from 38.1% to 58.8%.

For CEOs, greater interpersonal skills (factor 2) have a positive effect on being hired. The estimated coefficient is positive across all specifications, although it is insignificant for outside CEO candidates. This pattern is interesting because KKS show that greater CEO execution skills correlate with more successful outcomes for the hiring companies. This tension between the pool of assessed CEO candidates and those who are actually hired suggests that interpersonal skills are valued differently in the board's hiring decision than in identifying the pool of potential candidates.

Across the specifications in Table VII, we see no consistent pattern in the coefficients for factors 3 and 4. Both factors have mostly negative coefficients, but the magnitudes are small, and they appear to be less important for hiring decisions.

Overall, the results suggest that greater general ability and interpersonal skills are positively related to CEO candidates being hired. In their recent

Table VII

Probit Estimates of Hiring Decisions

This table presents probit estimates of hiring decisions as a function of factor estimates based on characteristic ratings from 2,603 candidate assessments by ghSMART. In all specifications, the dependent variable is an indicator for a candidate being hired. Standard errors are in parentheses. Statistical significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Probit Estimates of Hiring

	(1) CEO	(2) CFO	(3) COO	(4) CXO	(5) Other	(6) ALL
Factor 1	0.21***	0.37***	0.20	0.24***	0.34***	0.28***
(+Ability)	(0.055)	(0.077)	(0.131)	(0.040)	(0.043)	(0.029)
Factor 2	0.13**	−0.00	0.15	0.12***	0.13***	0.12***
(–Execution)	(0.054)	(0.084)	(0.125)	(0.042)	(0.044)	(0.030)
Factor 3	−0.08	−0.11	−0.25	−0.05	0.04	−0.01
(–Charisma)	(0.058)	(0.121)	(0.174)	(0.046)	(0.046)	(0.032)
Factor 4	−0.08	0.05	−0.02	−0.09*	−0.08*	−0.08**
(+Strategic)	(0.061)	(0.111)	(0.158)	(0.049)	(0.047)	(0.034)
Incumbent	1.15***	1.81***	1.51***	1.29***	1.20***	1.25***
	(0.105)	(0.222)	(0.274)	(0.086)	(0.092)	(0.063)
Female	−0.37*	0.40	0.62	−0.03	−0.05	−0.05
	(0.220)	(0.296)	(0.680)	(0.160)	(0.120)	(0.095)
Constant	−0.28***	−0.21	−0.10	−0.28***	−0.19**	−0.24***
	(0.096)	(0.151)	(0.302)	(0.075)	(0.076)	(0.053)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	787	326	154	1,263	1,142	2,405

Panel B: Hiring of Incumbents

	(1) CEO	(2) CFO	(3) COO	(4) CXO	(5) Other	(6) ALL
Factor 1	0.15*	0.05	−0.21	0.07	0.17***	0.12***
(+Ability)	(0.086)	(0.158)	(0.242)	(0.065)	(0.066)	(0.045)
Factor 2	0.18**	0.07	−0.34	0.15**	0.07	0.10**
(–Execution)	(0.080)	(0.172)	(0.285)	(0.064)	(0.067)	(0.045)
Factor 3	−0.19**	−0.24	−0.03	−0.09	0.10	−0.01
(–Charisma)	(0.082)	(0.265)	(0.233)	(0.068)	(0.067)	(0.047)
Factor 4	−0.17*	0.21	0.30	−0.16**	−0.08	−0.11**
(+Strategic)	(0.090)	(0.282)	(0.273)	(0.075)	(0.069)	(0.050)
Female	−0.34*	−0.13		−0.08	−0.37*	−0.27*
	(0.327)	(0.626)		(0.251)	(0.202)	(0.154)
Constant	0.85***	1.22***	1.78***	0.93***	1.02***	0.97***
	(0.148)	(0.313)	(0.411)	(0.121)	(0.127)	(0.087)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	362	89	82	532	462	994

(*Continued*)

Table VII—*Continued*

Panel C: Hiring of Outsiders

	(1) CEO	(2) CFO	(3) COO	(4) CXO	(5) Other	(6) ALL
Factor 1	0.26***	0.53***	0.49**	0.36***	0.48***	0.40***
(+Ability)	(0.074)	(0.099)	(0.229)	(0.054)	(0.061)	(0.040)
Factor 2	0.11	−0.03	0.64***	0.10*	0.16***	0.13***
(–Execution)	(0.076)	(0.100)	(0.236)	(0.056)	(0.060)	(0.041)
Factor 3	0.01	−0.02	−0.57*	−0.02	0.01	−0.02
(–Charisma)	(0.085)	(0.147)	(0.320)	(0.066)	(0.066)	(0.046)
Factor 4	−0.01	−0.01	−0.39	−0.05	−0.09	−0.07
(+Strategic)	(0.087)	(0.129)	(0.243)	(0.066)	(0.067)	(0.046)
Female	−0.45	0.49	−0.06	−0.01	0.15	−0.09
	(0.309)	(0.323)	(1.091)	(0.208)	(0.148)	(0.118)
Constant	−0.30***	−0.16	−0.00	−0.27***	−0.23***	−0.25***
	(0.113)	(0.168)	(0.409)	(0.088)	(0.087)	(0.062)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	425	237	72	731	680	1,411

Panel D: Hiring and Subjective Ratings

	(1) CEO	(2) CFO	(3) COO	(4) CXO	(5) Other	(6) ALL
Factor 1	0.13**	0.41***	0.14	0.20***	0.33***	0.26***
(+Ability)	(0.063)	(0.096)	(0.164)	(0.047)	(0.054)	(0.035)
Factor 2	0.15**	0.03	0.17	0.13**	0.08	0.10**
(–Execution)	(0.069)	(0.129)	(0.172)	(0.056)	(0.060)	(0.040)
Factor 3	−0.05	−0.18	−0.15	−0.06	0.01	−0.02
(–Charisma)	(0.065)	(0.143)	(0.199)	(0.054)	(0.056)	(0.039)
Factor 4	−0.09	0.07	−0.22	−0.10*	−0.10*	−0.10***
(+Strategic)	(0.065)	(0.126)	(0.199)	(0.053)	(0.053)	(0.037)
Nice Person	0.26*	−0.16	0.19	0.16	0.10	0.14
	(0.145)	(0.295)	(0.420)	(0.122)	(0.133)	(0.089)
Risk-taker	0.22*	0.05	0.22	0.13	−0.04	0.05
	(0.112)	(0.200)	(0.309)	(0.090)	(0.099)	(0.066)
Personality	0.21*	0.00	0.38	0.16	0.10	0.13*
	(0.127)	(0.200)	(0.329)	(0.099)	(0.105)	(0.071)
Good sales	0.16	−0.14	−0.03	−0.01	0.03	0.01
	(0.137)	(0.198)	(0.317)	(0.098)	(0.104)	(0.071)
Career path	0.01	−0.01	0.64**	0.03	−0.09	−0.03
	(0.105)	(0.192)	(0.318)	(0.086)	(0.097)	(0.064)
Incumbent	1.09***	1.81***	1.54***	1.21***	1.18***	1.20***
	(0.112)	(0.261)	(0.329)	(0.093)	(0.103)	(0.069)
Female	−0.32	0.38	0.68	−0.02	−0.25*	−0.17
	(0.241)	(0.367)	(0.759)	(0.180)	(0.139)	(0.108)
Constant	−0.86***	−0.05	−0.70	−0.56***	−0.19	−0.40***
	(0.224)	(0.353)	(0.664)	(0.172)	(0.184)	(0.125)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	718	249	132	1,095	915	2,010

(*Continued*)

Table VII—*Continued*

Panel E: Hiring and Ownership Type, All Candidates

	(1) VC	(2) Growth Equity	(3) Buyout	(4) Public	(5) Other Private
Factor 1	0.20**	0.25***	0.25***	0.58***	0.43***
(+Ability)	(0.081)	(0.078)	(0.042)	(0.141)	(0.114)
Factor 2	0.01	0.20**	0.17***	0.04	0.24**
(–Execution)	(0.071)	(0.085)	(0.046)	(0.115)	(0.112)
Factor 3	−0.04	0.02	0.01	0.09	−0.06
(–Charisma)	(0.078)	(0.093)	(0.048)	(0.132)	(0.115)
Factor 4	−0.11	−0.26***	−0.03	−0.19	0.14
(+Strategic)	(0.077)	(0.089)	(0.052)	(0.120)	(0.154)
Incumbent	1.01***	1.23***	1.26***	1.50***	1.39***
	(0.149)	(0.174)	(0.096)	(0.223)	(0.281)
Female	−0.20	0.22	−0.20	0.34	0.18
	(0.271)	(0.243)	(0.164)	(0.277)	(0.294)
Constant	0.05	−0.33	−0.21***	−0.59***	−0.51**
	(0.182)	(0.184)	(0.074)	(0.205)	(0.198)
Time FEs	Yes	Yes	Yes	Yes	Yes
Observations	377	312	1,082	261	186

Panel F: Hiring and Company Size (from Public Sources), All Candidates

	(1) Small	(2) Medium	(3) Large	(4) Very Large
Factor 1	0.17**	0.25***	0.20**	0.70***
(+Ability)	(0.078)	(0.047)	(0.077)	(0.096)
Factor 2	0.06	0.15***	0.20***	0.10
(–Execution)	(0.069)	(0.053)	(0.075)	(0.087)
Factor 3	−0.03	0.03	0.14	0.06
(–Charisma)	(0.077)	(0.056)	(0.085)	(0.099)
Factor 4	−0.08	−0.13**	0.00	−0.11
(+Strategic)	(0.077)	(0.059)	(0.085)	(0.095)
Incumbent	1.01***	1.21***	1.55***	1.23***
	(0.145)	(0.113)	(0.170)	(0.156)
Female	−0.25	0.13	−0.18	0.01
	(0.263)	(0.173)	(0.249)	(0.202)
Constant	0.00	−0.14	−0.25**	−0.78***
	(0.176)	(0.095)	(0.123)	(0.149)
Time FEs	Yes	Yes	Yes	Yes
Observations	402	770	408	416

(*Continued*)

Table VII—*Continued*

Panel G: Hiring and Company Size (from Public Sources), CEO Candidates

	(1) Small	(2) Medium	(3) Large	(4) Very Large
Factor 1	−0.13	0.33***	0.04	0.71***
(+Ability)	(0.127)	(0.089)	(0.166)	(0.245)
Factor 2	0.21**	0.14	0.30**	−0.14
(–Execution)	(0.107)	(0.095)	(0.147)	(0.254)
Factor 3	0.07	−0.11	0.00	0.11
(–Charisma)	(0.119)	(0.101)	(0.173)	(0.222)
Factor 4	−0.33**	−0.09	0.10	−0.11
(+Strategic)	(0.145)	(0.103)	(0.173)	(0.268)
Incumbent	1.12***	1.16***	1.08***	0.74*
	(0.212)	(0.181)	(0.328)	(0.390)
Female	0.17	−0.43	−0.70	
	(0.389)	(0.373)	(0.710)	
Constant	0.14	−0.18	0.15	−0.90***
	(0.270)	(0.166)	(0.260)	(0.330)
Time FEs	Yes	Yes	Yes	Yes
Observations	194	280	113	72

book, Botelho and Powell (2018), two senior ghSMART executives, rely on this result and their experiences with assessed candidates to recommend that candidates present themselves as likeable when interviewing for jobs.

Across all specifications and positions, incumbents are significantly more likely to be hired than outsiders. Panels B and C of Table VII report separate estimates for incumbents and outsiders. General ability appears more important for outside candidates.

Female CEO candidates are less likely to be hired, although the negative coefficients are not always significant. Due to the small number of female candidates, these results should be interpreted with caution.

Panel D of Table VII adds the subjective ratings as explanatory variables. The estimated effects for the four factors remain largely similar to the estimates in Panel A without these ratings. For CEO candidates, being rated as a nice person, as a risk-taker, and as having an outgoing personality is associated with a greater chance of being hired, which is consistent with the positive effect of CEO candidates' interpersonal skills (factor 2).

Panel E of Table VII presents estimates of hiring decisions for companies with different ownership types—venture capital, growth equity, buyout, public, and other private companies. General ability is significantly related to being hired across all ownership types, with the effect particularly strong for public companies. Candidates with more interpersonal skills tend to be more likely to be hired, with this effect stronger for growth equity, buyout, and other private companies. Overall, the hiring patterns appear to be similar across hiring companies with different ownership types.

Panel F of Table VII presents estimates of hiring decisions for all candidates by companies of different sizes. Panel G reports these estimates for CEO candidates only. We report factors separately for firms with no revenue (Small), below $100 million in revenue (Medium), between $100 million and $1 billion in revenue (Large) and above $1 billion in revenue (Very Large). We note that the number of observations for the size subsamples does not equal the total number of observations because we are unable to obtain revenue data for all of the companies in our sample.

For all candidates, the patterns are largely similar to those in the other panels. For all firm sizes, hired candidates have more general ability and are less execution-oriented. The coefficients on general ability are significant for all company sizes, with the magnitude of the coefficient tending to increase with company size. Execution ability is significant for medium and large companies. For CEOs, the results are less clear-cut. Medium and Very Large companies hire candidates with significantly more general ability, while Small and Large companies hire candidates who are significantly less execution oriented.

The results are qualitatively similar when we include indicators for educational background—both MBA and selective college.

Overall, although not completely uniform, the patterns in Table VII are consistent with boards hiring CEOs and other candidates who are more talented and less execution-oriented.

IV. Personalities and Subsequent Careers

Endogeneity is a concern for the reported results. In particular, ghSMART's interviewers may rate CEO candidates higher on certain characteristics because they expect CEO candidates to have these characteristics or because this bias is inherent in ghSMART's assessment methodology. Alternatively, the characteristics and factor scores may be specific to ghSMART's assessment methodology, or the circumstances of the companies that elect to use ghSMART.

To evaluate the external validity of our results, we perform an out-of-sample analysis where we consider whether the assessments and factor structure predict candidates' subsequent long-term careers. We consider whether the characteristics of non-CEO candidates, that is, candidates who were considered for a position other than a CEO position when initially assessed, predict whether these candidates subsequently become CEOs. Importantly, such subsequent promotions and job changes occur later, typically in other companies, and without the involvement of ghSMART. Hence, investigating whether the initially assessed characteristics predict future career progressions provides a test of the classifications of the personalities and hiring decisions of CEO, CFO, and COO candidates. As reported below, we find that the characteristics are indeed predictive of the candidates' future careers, confirming the broader validity of the classifications.

For each candidate, we used LinkedIn, CapitalIQ, and other Internet searches to determine their subsequent career and whether the candidate later

becomes a CEO, COO, or CFO. Table VIII presents the results. Panel A shows that 79% of CEO candidates eventually become CEOs, and 16% of non-CEO candidates become CEOs. Panels B and C report these percentages for CFO and COO candidates. Interestingly, Panel D of Table VIII shows that only 2% of candidates considered for CEO positions eventually become CFOs, and Panel E shows that only 10% of CFO candidates eventually become CEOs. There is sometimes a perception that CFOs are natural successors for CEOs, but this does not appear to be the case for our candidates, which is also consistent with our finding that CEO and CFO candidates have distinct personality traits.

A. Candidates Who Eventually Become Managers

Table IX provides evidence on which non-CEO candidates become CEOs. Panel A reports their average factor scores. On average, non-CEO candidates who become CEOs have more general ability (factor 1), execution ability (negative factor 2), charisma (negative factor 3), and strategic focus (factor 4), with all of these differences highly statistically significant (p-values $< 1\%$). Importantly, the pattern in the factor scores (positive factor 1, negative factors 2 and 3, and positive factor 4) is the same as the pattern in the factor scores for CEO candidates. Hence, the non-CEO candidates who later become CEOs tend to be those with personality traits and factor scores that more closely resemble those of the typical CEO candidate.

The non-CFO candidates who later become CFOs have higher scores on the third factor, reflecting a personality with greater analytical skills (p-value $< 1\%$). We find no significant differences in the factors scores for factors 1, 2, and 4 between non-CFOs who do and do not become CFOs.

Finally, non-COOs who later become COOs have more execution ability (negative factor 2) and attention to detail (negative factor 4). The hypotheses of equal factor scores for the second and fourth factors are only rejected with p-values of 8.3% and 7.3%, respectively, so the differences are just marginally statistically significant. There is no evidence of any differences for factors 1 and 3.

Taken together, the patterns in Tables VI and IX show that non-CEO, non-CFO, and non-COO candidates who later become CEOs, CFOs, and COOs are the candidates with personality traits that more closely resemble those of the typical candidates for these positions. A typical CEO candidate has greater general ability (factor 1), more execution ability and charisma (negative factors 2 and 3), and greater strategic focus (factor 4), while a typical CFO candidate is more analytical (factor 3), and a typical COO candidate has a more managerial personality and greater attention to detail (negative factor 4).

B. Predicting Who Become Managers

To formally test whether the candidates' factor scores predict their subsequent careers, Panel B of Table IX presents probit estimates where the dependent variable indicates whether a candidate is eventually employed in the

Table VIII
Career Paths

The panels show the number of candidates assessed for the initially indicated position in 2,603 candidate assessments by ghSMART who are eventually hired during their subsequent careers for the other indicated position.

Panel A: Assessed for CEO and Eventual CEO

	Eventual CEO		
CEO	No	Yes	Total
No	1,489	289	1,778
	(84%)	(16%)	(100%)
Yes	176	649	825
	(21%)	(79%)	(100%)
Total	1,665	938	2,603
	(64%)	(36%)	(100%)

Panel B: Assessed for CFO and Eventual CFO

	Eventual CFO		
CFO	No	Yes	Total
No	2,200	66	2,266
	(97%)	(3%)	(100%)
Yes	92	245	337
	(27%)	(73%)	(100%)
Total	2,292	311	2,603
	(88%)	(12%)	(100%)

Panel C: Assessed for COO and Eventual COO

	Eventual COO		
COO	No	Yes	Total
No	2,268	173	2,441
	(93%)	(7%)	(100%)
Yes	87	75	162
	(54%)	(46%)	(100%)
Total	2,355	248	2,603
	(90%)	(10%)	(100%)

Panel D: Assessed for CEO and Eventual CFO

	Eventual CFO		
CEO	No	Yes	Total
No	1,484	294	1,778
	(83%)	(17%)	(100%)
Yes	808	17	825
	(98%)	(2%)	(100%)
Total	2,292	311	2,603
	(88%)	(12%)	(100%)

(*Continued*)

Table VIII—*Continued*

Panel E: Assessed for CFO and Eventual CEO

	Eventual CEO		
CFO	No	Yes	Total
No	1,360	906	2,266
	(60%)	(40%)	(100%)
Yes	305	32	337
	(91%)	(10%)	(100%)
Total	1,665	938	2,603
	(64%)	(36%)	(100%)

given position. The explanatory variables are the candidate's factor scores, gender, and incumbency. For each specification, the sample is restricted to candidates who are assessed for positions other than the given position, that is, non-CEO, non-CFO, and non-COO candidates.

Specifications (1) and (4) confirm that the probability of becoming a CEO is significantly related to the four factors, with the estimated coefficients reflecting the factor scores for the typical CEO candidate. The probability of becoming a CEO increases with general ability (factor 1), execution ability and charisma (negative factors 2 and 3), and strategic focus (positive factor 4). The four coefficients have similar magnitudes across specifications and are statistically significant. To illustrate the magnitude, in specification (1), the marginal effect of a one-standard-deviation increase in each of the four factor scores is associated with an increase in the probability of becoming CEO of 3.3%, −4.2%, −3.9%, and 3.5%, respectively.

Specifications (2) and (5) report estimates for non-CFO candidates. Candidates with more analytical ability (factor 3) are more likely to become CFOs. For the COO position, specifications (3) and (6) show that non-COO candidates with greater execution ability and more focus on managerial detail are more likely to become COOs.

The specifications in Panel C of Table IX include the five subjective ratings. The results are qualitatively similar to those in the previous specifications. For CEOs, the results for the factors are similar, but the coefficient on general ability (factor 1) is now insignificant. For CFO and COOs the statistical significance of the coefficients is also reduced. When controlling for the factor scores, being good at sales is the single subjective rating that significantly predicts whether a candidate becomes CEO or CFO—for CEOs this effect is positive, while for CFOs it is negative.

Panel D of Table IX repeats the specification for candidates who are initially considered for a position in a hiring company classified as venture capital, private equity, and public. Across these company types, non-CEO candidates with more execution ability (negative factor 2) and more strategic focus (factor 4) have a significantly higher probability of becoming a CEO. For hiring

Table IX
Who Become Managers?

Panel A presents factor scores for candidates who obtain the indicated position later in their career, but did not initially interview for that position. For each indicated position, the sample is restricted to candidates not employed in the indicated position at the time of the assessment and not assessed for the indicated position (i.e., non-CEO, non-CFO, and non-COO candidates). Panels B, C and D present probit regressions where the dependent variables are indicator variables equal to 1 if the candidate obtained the indicated position later in their career. For example, the non-CEO regressions indicate whether a candidate not interviewed for a CEO role by ghSmart ultimately became a CEO. Standard errors are in parentheses. Statistical significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

Panel A: Factor Scores for Candidates Eventually Obtaining Indicated Position

	Non-CEO	Non-CFO	Non-COO
Factor 1 (+Ability)	0.12	−0.12	0.09
Factor 2 (–Execution)	−0.17	0.05	−0.12
Factor 3 (–Charisma)	−0.10	0.39	−0.01
Factor 4 (+Strategic)	0.07	−0.08	−0.10

Panel B: Probit Estimates of Eventually Obtaining Indicated Position

	(1) Non-CEO	(2) Non-CFO	(3) Non-COO	(4) Non-CEO	(5) Non-CFO	(6) Non-COO
Factor 1	0.14***	−0.06	0.05	0.14***	−0.07	0.06
(+Ability)	(0.039)	(0.056)	(0.041)	(0.040)	(0.057)	(0.042)
Factor 2	−0.18***	0.03	−0.07*	−0.17***	0.03	−0.07*
(–Execution)	(0.039)	(0.059)	(0.041)	(0.039)	(0.060)	(0.041)
Factor 3	−0.17***	0.29***	0.01	−0.17***	0.26***	0.02
(–Charisma)	(0.041)	(0.069)	(0.045)	(0.042)	(0.070)	(0.046)
Factor 4	0.15***	−0.08	−0.09*	0.15***	−0.08	−0.10**
(+Strategic)	(0.043)	(0.067)	(0.046)	(0.043)	(0.069)	(0.048)
Incumbent				0.02	−0.09	0.12
				(0.079)	(0.118)	(0.082)
Female				−0.37***	−0.49*	−0.77***
				(0.129)	(0.267)	(0.206)
Constant	−1.00***	−1.84***	−1.60***	−0.99***	−1.80***	−1.59***
	(0.066)	(0.092)	(0.073)	(0.073)	(0.104)	(0.081)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,778	2,266	2,441	1,759	2,237	2,412

Panel C: Probit Estimates of Eventually Obtaining Indicated Position

	(1) Non-CEO	(2) Non-CFO	(3) Non-COO	(4) Non-CEO	(5) Non-CFO	(6) Non-COO
Factor 1	0.07	0.02	0.04	0.07	0.02	0.06
(+Ability)	(0.046)	(0.074)	(0.049)	(0.047)	(0.075)	(0.050)
Factor 2	−0.12**	0.01	−0.05	−0.12**	0.01	−0.06
(–Execution)	(0.054)	(0.085)	(0.055)	(0.054)	(0.085)	(0.056)
Factor 3	−0.13***	0.15*	0.02	−0.13**	0.14	0.02
(–Charisma)	(0.049)	(0.085)	(0.053)	(0.050)	(0.086)	(0.054)
Factor 4	0.12**	−0.01	−0.07	0.12**	−0.02	−0.08
(+Strategic)	(0.049)	(0.078)	(0.051)	(0.049)	(0.079)	(0.052)

(*Continued*)

Table IX—*Continued*

Panel C: Probit Estimates of Eventually Obtaining Indicated Position

	(1) Non-CEO	(2) Non-CFO	(3) Non-COO	(4) Non-CEO	(5) Non-CFO	(6) Non-COO
Nice person	−0.15	−0.01	0.02	−0.15	−0.02	0.03
	(0.118)	(0.189)	(0.126)	(0.118)	(0.190)	(0.127)
Risk-taker	0.13	0.17	0.01	0.13	0.16	−0.01
	(0.089)	(0.143)	(0.093)	(0.090)	(0.143)	(0.093)
Personality	0.02	−0.11	−0.12	0.02	−0.12	−0.12
	(0.095)	(0.143)	(0.097)	(0.095)	(0.144)	(0.098)
Good sales	0.22**	−0.56***	0.07	0.21**	−0.58***	0.06
	(0.094)	(0.143)	(0.099)	(0.094)	(0.144)	(0.101)
Career path	0.11	−0.03	−0.03	0.11	−0.03	−0.03
	(0.085)	(0.136)	(0.089)	(0.086)	(0.137)	(0.089)
Incumbent				0.04	−0.06	0.12
				0.087	0.136	0.089
Female				−0.28**	−0.40	−0.66***
				0.143	0.283	0.215
Constant	−1.14***	−1.58***	−1.55***	−1.14***	−1.50***	−1.54***
	(0.160)	(0.243)	(0.171)	(0.166)	(0.253)	(0.177)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,410	1,898	2,018	1,406	1,892	2,012

Panel D: Probit Estimates of Eventually Obtaining Indicated Position

	(1)	(2)	(3)	(4)	(5)	(6)
	Venture Capital		Private Equity		Public	
	Non-CEO	Non-CFO	Non-CEO	Non-CFO	Non-CEO	Non-CFO
Factor 1	0.31**	0.02	0.15***	−0.10	−0.00	−0.04
(+Ability)	(0.126)	(0.179)	(0.050)	(0.075)	(0.142)	(0.216)
Factor 2	−0.35***	0.14	−0.10*	0.02	−0.36***	0.14
(–Execution)	(0.111)	(0.172)	(0.054)	(0.083)	(0.131)	(0.217)
Factor 3	−0.22*	0.26	−0.13**	0.31***	−0.19	0.31
(–Charisma)	(0.113)	(0.207)	(0.054)	(0.098)	(0.141)	(0.240)
Factor 4	0.24**	−0.02	0.12**	−0.17*	0.40***	−0.06
(+Strategic)	(0.111)	(0.192)	(0.059)	(0.093)	(0.139)	(0.215)
Female	−0.41		−0.64***	−0.55	−0.11	−0.12
	(0.462)		(0.195)	(0.380)	(0.312)	(0.488)
Constant	−0.88***	−1.90***	−1.00***	−2.09***	−1.06***	−1.67***
	(0.260)	(0.325)	(0.086)	(0.148)	(0.230)	(0.306)
Time FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	205	310	961	1,263	261	256

companies that are venture capital and private equity backed, the coefficients more strongly mirror the typical CEO pattern of the factor scores, with positive coefficients on the first and fourth factors and negative coefficients on the second and third factors. This finding could indicate that start-ups and private equity-funded companies provide a more efficient sorting of candidates by

more significantly increasing the chances that candidates with greater CEO potential actually become CEOs.[16]

C. Implications of Out-of-Sample Analysis

The out-of-sample analysis supports the validity of the assessments and our results about managerial characteristics. CEOs tend to have more general talent, are more execution-oriented, are more charismatic, and have more strategic focus. Non-CEOs with those characteristics are more likely to become CEOs than other non-CEOs. The different results for CFOs (vs. CEOs) provide additional support for the validity of the assessments. The results strongly support the hypothesis that different characteristics and factors are important for different managerial positions. The results are also predictive for which candidates are more likely to ultimately become CEOs, CFOs, and COOs.

The results are noteworthy because non-CEO candidates regularly become CEOs several years later, in other companies, and through hiring processes that do not involve ghSMART. Finding that the candidates' characteristics, as initially assessed by ghSMART, remain predictive for the candidates' future career trajectory implies that these characteristics are informative about the candidates' personality traits, when evaluated in other circumstances, and that these characteristics are at least somewhat stable over time.

The finding that the candidates' characteristics are informative about their future careers also confirms that ghSMART's assessment process cannot be arbitrarily gamed by the candidates. If it could, the characteristics would not remain statistically predictive when the candidates are evaluated without the involvement of ghSMART, presumably using different processes and assessment methods.

Finally, the out-of-sample analysis supports the external validity of the classification of the characteristics across CEOs, CFOs, and COOs. A concern is that this classification is specific to ghSMART, and that our classification merely recovers what ghSMART and its methodology consider to be the salient or typical characteristics of a promising CEO. Confirming that non-CEO candidates with more typical CEO characteristics are also more likely to be promoted to CEOs in other contexts (and similarly for CFOs and COOs) suggests that the classification applies more broadly, beyond ghSMART and the companies in our data.

V. Summary and Discussion

Using a data set of 2,603 assessments of candidates for top managerial positions—including CEOs, CFOs, and COOs—we characterize candidates' personalities with four factors: general ability, execution versus interpersonal, charisma versus analytical, and having a strategic focus versus a focus on

[16] These results remain qualitatively the same when we include indicators for educational background—both MBA and selective college.

managerial detail. The first two factors are similar to the factors identified in a smaller sample of 316 CEO candidates in KKS. Recovering these factors in a larger sample with more diverse candidates suggests that these two factors capture managerial characteristics in general, and that they are not specific to CEOs. The third and fourth factors are new.

CEO candidates are distinct. They typically have more extreme scores on general ability, execution, charisma, and a strategic focus. CFOs, in contrast, have lower scores on general ability and tend to be more interpersonal, analytical, and more detail focused. According to our classification, CEOs and CFOs are diametrically opposite. These results are consistent with Graham, Harvey, and Puri (2013), who also find that CEOs differ from CFOs in being more optimistic and less risk-averse.

Candidates considered by public and larger companies score higher than candidates from private and smaller companies. This is consistent with Adams, Keloharju, and Knupfer (2018), who find that CEOs are more (cognitively and noncognitively) talented on average, and that larger companies hire more talented CEOs.

Importantly, in an out-of-sample analysis, the candidates' scores on the four factors predict their future career progressions. Non-CEO candidates who have more CEO-like personalities are more likely to subsequently become CEOs.

The out-of-sample test provides evidence that our assessments yield valid and persistent measures of candidates' personality traits. This is noteworthy because these non-CEO candidates typically become CEOs several years later, in other companies, and through hiring processes that do not involve ghSMART. Finding that the candidates' characteristics, as initially assessed by ghSMART, remain predictive for the candidates' future career trajectory implies that these characteristics are informative about the candidates' qualities, when evaluated in other circumstances, and that these characteristics are at least somewhat stable over time. The finding that the candidates' characteristics are informative about their future career development, also confirms that ghSMART's assessment process cannot be arbitrarily gamed by the candidates.

We do not find any substantial differences in the four factors for men and women. We do find, however, that women are less likely to become CEOs and COOs, controlling for these factors. These results are exploratory because of the relatively small number of women candidates.

Finally, hired candidates generally have greater interpersonal skills than the assessed candidates. This suggests that interpersonal skills are valued differently when used in the hiring decision than when used to identify a pool of candidates. This is particularly interesting for CEOs, given that CEO candidates are especially distinguished by their execution skills, executions skills predict whether candidates subsequently become CEOs, and KKS show that execution skills are strongly correlated with success.

We believe that these results complement existing academic research and are potentially relevant for both boards choosing CEOs and candidates aspiring to become CEOs.

First, our results are relevant to previous academic work. The finding that CEOs are different from and more talented than other candidates is consistent with Adams Keloharju, and Knupfer (2018) and Graham, Harvey, and Puri (2013). The finding that CEOs have greater charisma is consistent with Green, Jame, and Lock (2019) and Palaiou and Furnham (2014), who find that CEOs are more extraverted.

Second, the results in this paper, together with those in KKS, suggest that boards might focus more on execution skills when choosing a CEO. KKS study the performance of a subset of our sample and find that characteristics related to execution are highly correlated with subsequent CEO success for private equity-funded companies. The results in this paper complement those in KKS by showing that execution related skills are important for distinguishing CEO candidates and for determining whether an executive ultimately becomes a CEO.

Third, the result that hired CEO candidates score lower on execution skills (and higher on interpersonal skills) than assessed candidates on average implies that boards and shareholders overweight interpersonal skills in their hiring decisions. This seems possible, given that interpersonal skills are correlated with our RAs' classification of candidates as nice. This is also consistent with Barrick et al. (2012), who find that interviewers' first impressions and rapport with a candidate affect their evaluation of the candidate. In line with our interpretation, the data, and their experience, Botelho, Powell, and Wang (2016) caution boards not to hire a CEO candidate who is nice but does not have strong execution skills.

Although we think this is the most plausible interpretation of our results, we acknowledge that other interpretations are possible. First, it is possible that boards and private equity firms overvalue interpersonal skills when they hire ghSMART. ghSMART's business has grown markedly over the last 15 years with both private equity firms and with public companies. If ghSMART were giving biased advice, it seems unlikely that they would have grown so much. Furthermore, many private equity firms, particularly the larger ones, have brought the assessment function in-house, suggesting again that it is valuable. Second, it is possible that execution-oriented CEOs could be more likely to turn down offers, so that it appears that boards overvalue interpersonal skills. Although possible, we view this explanation as unlikely for two reasons. First, our understanding from ghSMART is that the candidates they interview are all strongly interested in the positions for which they are assessed. Given the cost, the assessing firms are not likely to schedule assessments if the candidates were not disposed to accept them. Second, subsequent to this research, ghSMART conducted their own analysis and reached similar conclusions in Botelho and Powell (2018). As mentioned above, ghSMART now explicitly recommends that boards not hire CEOs who are too nice.

Finally, the results potentially provide some guidance to those who aspire to be CEOs. Candidates who score higher on execution, charisma, and strategic focus are more likely to become CEOs. An important question is whether it is possible for a candidate to improve those factors or skills. It seems

plausible that candidates can improve execution skills by being more persistent, efficient, and proactive. Drucker (1967) recommends precisely these actions to become an effective executive. It is less clear whether candidates can improve their charisma and strategic focus. At the same time, the results suggest that CEO candidates should work hard to present themselves as likeable when interviewing for a job. Botelho and Powell (2018) make exactly this recommendation. These takeaways represent interesting questions for future research.

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Appendix

Table A.1
ghSMART Guidelines for Scoring Characteristics

This table presents the ghSMART guidelines for scoring the characteristics in their executive assessments.

Characteristics	Description	Behavior Associated with High Score	Behavior Associated with Low Score
Leadership			
Hires A-players	Sources, recruits, and hires A-players.	Hires A-players 90% of the time.	Hires A-players 25% of the time.
Develops people	Coaches people in their current roles to improve performance, and prepares them for future roles.	Teams say that Candidate gives a lot of coaching/development. Many team members go on to bigger roles.	Teams do not say on Candidate gives a lot of coaching. Team members do not go on to do better things.
Removes underperformers	Removes C-players within 180 days. Achieves this through coaching-out, redeployment, demotion, or termination.	Removes C-players within 180 days of taking a new role or hiring the person.	May remove occasional C-player, but keeps most of them, often for years.
Respect	Values others, treating them fairly and showing concern for their views and feelings.	Teams would say Candidate is fair and respectful. Candidate describes performance in terms of team effort.	Candidate is self-absorbed. Team members might call Candidate abrasive, rough around the edges.
Efficiency	Able to produce significant output with minimal wasted effort.	Candidate gets a lot done in a short period of time.	Candidate's output is unimpressive. He is a "thinker" with poor execution.
Network	Possesses a large network of talented people.	Candidate has a proven ability to build a network very quickly.	Candidate does not have big network and shows limited ability to build one.

(*Continued*)

Table A.1—*Continued*

Characteristics	Description	Behavior Associated with High Score	Behavior Associated with Low Score
Flexible	Adjusts quickly to changing priorities and conditions. Copes with complexity and change.	Candidate is not bothered by new or changing circumstances. Faces change in a matter-of-fact manner.	Candidate bristles when changes take place, often blames others for not doing their jobs.
Personal			
Integrity	Does not cut corners ethically. Earns trust and maintains confidences.	Takes pride in always doing what is right.	Cuts corners, unaware of how actions are borderline unethical.
Organization	Plans, organizes, schedules, and budgets in an efficient, productive manner.	Job accomplishments closely match goals. Candidate sets priorities.	Candidates' accomplishments do not match goals, and individual meanders.
Calm	Maintains stable performance when under heavy pressure or stress.	Performs under a wide variety of circumstances, regardless of stress.	Overreacts to high pressure situations. Fails to accomplish goals under stress.
Aggressive	Moves quickly and takes a forceful stand without being overly abrasive.	Candidate sticks neck out with words and actions, even if upsets others.	Candidate takes a wait-and-see attitude, moving more slowly to minimize risk.
Fast	Takes action quickly without getting bogged down by obstacles.	Candidate takes action and gets a lot done in a short period of time.	Candidate is slow to accomplish results.
Commitments	Lives up to verbal and written agreements, regardless of personal cost.	Gets the job done, no matter what.	Does not live up to verbal or written agreements.
Intellectual			
Brainpower	Learns quickly. Demonstrates ability to quickly understand and absorb new info.	High GPA and SAT scores, ability to pick-up new job details quickly.	Low GPA and SAT scores. May remain in same role for a long time.
Analytical skills	Structures and processes qualitative or quantitative data and draws conclusions.	Cites multiple examples of problem-solving skills.	Rarely solves problems through analysis. Heavy reliance on gut.
Strategic vision	Able to see and communicate the big picture in an inspiring way.	Holds a big vision for current and future roles. Inspires others' vision.	Does not have a vision for current or future roles. Does not value planning.
Creative	Generates new and innovative approaches to problems.	Offers new and innovative solutions to intractable problems many times.	Rarely offers creative solutions.

(*Continued*)

Table A.1—*Continued*

Characteristics	Description	Behavior Associated with High Score	Behavior Associated with Low Score
Attention to detail	Does not let important details slip through the cracks or derail a project.	Makes time to review the details. Asks penetrating questions.	Makes many mistakes because of ignoring small, but important details.
Motivational			
Enthusiasm	Exhibits passion and excitement over work. Has a "can do" attitude.	Displays high energy and a passion for the work.	Displays low energy and limited passion for the work.
Persistence	Demonstrates tenacity and willingness to go the distance to get something done.	Never gives up. Sticks with assignments until they are done.	Has a track record of giving up.
Proactive	Acts without being told what to do. Brings new ideas to company.	Regularly brings new ideas into an organization. Self-directed.	Never brings in new ideas. Takes direction/does not act until being told.
Work ethic	Possesses a strong willingness to work hard and long hours to get the job done.	Works long, hard hours to get the job done.	Does just enough to get the job done.
High standards	Expects personal performance and team performance to be the best.	Expects top performance from himself and from others around him.	Allows himself to do 80% of the job/lets poor performance from others slide.
Interpersonal			
Listening skills	Lets others speak and seeks to understand their viewpoints.	Displays ability to listen to others to understand meaning.	Cuts people off, does not address questions, misunderstands.
Open to criticism	Often solicits feedback and reacts calmly to receiving criticism.	Responds to criticism by finding ways to grow and become better.	Reacts to criticism by blaming others and becoming bitter.
Written communication	Writes clearly and articulately using correct grammar.	Demonstrates ability to write clearly in all forms of communication.	Does not offer any evidence of being a strong writer.
Oral communication	Speaks clearly and articulately without being overly verbose or talkative.	Speaks clearly, articulately, and succinctly.	Speaks too quickly or too slowly, mumbles, uses a lot of jargon, and so on.
Teamwork	Reaches out to peers and cooperates with supervisors to establish relationship.	Recognizes the power of a strong team, and works collaboratively.	Prefers to operate in isolation. May not work harmoniously with others.
Persuasion	Able to convince others to pursue a course of action.	Convinces others to take a course of action, even if initially in opposition.	Fails to or never tries to convince others to take a course of action.
Holds people accountable	Sets goals for team and follows-up to ensure progress toward completion.	Sets goals, follows-up, and holds people accountable for shortfalls.	Does not set goals, follow-up, or hold people accountable.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher's website:

Appendix S1: Internet Appendix.
Replication Code.