

## WHEN IS HUMAN CAPITAL A VALUABLE RESOURCE? THE PERFORMANCE EFFECTS OF IVY LEAGUE SELECTION AMONG CELEBRATED CEOs

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*We investigate whether and when highly trained human capital constitutes a rent-sustaining resource. Our study of 444 CEOs celebrated on the covers of major U.S. business magazines found an advantage accruing to graduates of selective universities. Such CEOs led firms with higher and more sustained market valuations. The advantage was strongest for undergraduate programs as these related to the kinds of talent demanded of a CEO. The advantage also was greatest in smaller firms where CEO discretion might be highest and for younger CEOs who may benefit most from college and are less able to appropriate rents. Finally, the advantage accrued to graduates of more recent years, when selective schools had become less socially elitist and increasingly meritocratic, thus favoring human versus social capital. Copyright © 2014 John Wiley & Sons, Ltd.*

### INTRODUCTION

We examine the conditions under which human capital constitutes a resource. Human capital is said to encompass the knowledge, skills, and talents inherent in individuals, yet its status as a source of economic rent remains unclear (Coff, 1999). Recent analyses show its impact on firm rents to be mixed (Crook *et al.*, 2011; Dimov and Shepherd, 2005; Goettesman and Morey, 2006; Martelli and Abels, 2010). Findings to date suggest that human capital is most valuable to a firm when it is a nontradable asset in labor markets such that its rent cannot be appropriated (Ahuja, Coff, and Lee, 2005; Coff, 1999; Lazear, 2009; Wang, He, and Mahoney, 2009) and when it is less subject to adverse selection (Akerlof and Yellen, 1986; Malmendier and Tate, 2009). It

also is shown to contribute more to operational outcomes such as efficiency, product quality (Hatch and Dyer, 2004), and personal evaluations than to firm returns, which are less consistently affected (Crook *et al.*, 2011).

Unfortunately, much of the literature operationalizes human capital as normal education or experience, which given their prevalence and potential imitability may not be adequate resource proxies (Barney, 1991). Another drawback is that many previous studies concentrate on the knowledge capital of middle-level employees whose output may relate only tangentially to firm-level economic rents (see the review by Crook *et al.*, 2011).

Our research attempts to address these gaps by studying a type of human capital that is relatively rare and highly selected and thus might well qualify as a resource: namely, graduates of Ivy League schools with stringent admissions policies. Moreover, we examine a group of chief executives who have risen to the top of their profession such that sustained outperformance in that rarified group would truly attest to a high level of capability.

Keywords: human capital; resource-based view; CEO demographics

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We also demonstrate the contingent nature of this human capital resource, highlighting just when and where it has the greatest value (Miller and Shamsie, 1996). CEO services are in some respects a tradable asset (Akerlof and Yellen, 1986; Coff, 1999). However, information asymmetries regarding a CEO's true potential may impede that person's ability to capture all of her incremental rent (Greenwald, 1986; Lazear, 2009; Lippman and Rumelt, 2003). We shall argue that that is especially true in early career and in smaller firms where a CEO is less visible to rival bidders. Appropriation may also be difficult where executive talent resides in subtle social and cognitive skills linked to a selective undergraduate program, or is firm specific (Hatch and Dyer, 2004; Holcomb, Holmes, and Connelly, 2009; Lippman and Rumelt, 2003).

We study a specially selected sample of celebrated CEOs—those who had significant power in directing their organizations and setting strategy, and whose putative status as human capital had been signaled independently, in our case by cover stories in the top three U.S. business journals: *Fortune*, *Business Week*, and *Forbes* from 1970 until 2008. To determine the potential resource status of human capital trained at a selective, quality institution, we compared the performance of the firms of CEOs who attended the eight Ivy League schools to that of the firms of other accomplished CEOs on the covers of the same magazines. Because resource-based view (RBV) criteria set a high bar for rarity, inimitability, and nonsubstitutability (Barney, 1991), and for the resulting “abnormal rents,” our sample of celebrated managers was a useful one for establishing the resource value of human capital. Moreover, the cover stories, rightly or not, ascribe the good performance to the CEOs, suggesting that they had considerable decision-making power and acted in visible ways to shape their companies. Finally, as we focus on market returns, our findings are net of any appropriation of rents (Coff and Kryscynski, 2011).

### **Ivy League selection as a marker of scarce human capital**

Human capital theory asserts that individual skills represent an important source of economic productivity, and that those skills can be enhanced by training and education (Becker, 1964; Zhang, 2012). It remains a question, however, whether an individual's selection by a stellar educational institution

can constitute or signal a resource—in other words, can a firm extract economic rents from pivotal human resources that have been especially well selected or trained (Coff, 1999)?

Ivy League schools represent the top echelon of U.S. universities, most of which have enjoyed outstanding reputations for more than a century. These schools include Harvard, Yale, Princeton, Columbia, Brown, Dartmouth, Pennsylvania, and Cornell, and are among the most selective in the world. Their acceptance rates generally range from about 5 to 15 percent of total applications (which themselves are likely to represent a higher-than-average quality pool, see <http://theivycoach.com/ivy-league-statistics-by-college/>), and their criteria for admission are both academic and social. Candidates must have demonstrated outstanding scholastic ability, general intelligence as demonstrated by standardized testing such as SAT scores, and leadership in extracurricular social activities (Hernández, 1997; Zhang, 2012). Thus, the vast majority of Ivy students will have proven their talent even before arriving at university.<sup>1</sup> Ivy League schools are also known to provide an excellent education. Moreover, before the 1960s, Ivy schools displayed a bias in favor of admitting those from wealthy establishment families with important social connections (Coleman, 1988; Kingston & Lewis, 1990; Palmer and Barber, 2001). It stands to reason, therefore, that admission to an Ivy League school may signal a human resource that is particularly likely to promote superior sustained performance, as those selected are, in effect, winners of a tournament of talent (Lazear and Rosen, 1981). We expect that firm performance effects signaled by Ivy League selection will be most marked for CEOs. CEOs usually have the greatest impact on a firm's strategic direction, and their actions may profoundly shape firm performance (Finkelstein, Hambrick, and Cannella, 2008; Henderson, Miller, and Hambrick, 2006). This might be especially the case among firms whose executives have been celebrated as being successful leaders.

Selection by a top university may indicate a variety of talents. Rogers (2010) has found that education was associated with more creativity and innovation, and greater receptiveness to new ideas.

<sup>1</sup> Dale and Krueger (2002) found that those admitted to Ivy schools who decided to go to colleges with lower SAT hurdles earned as much as did the Ivy graduates.

Higher levels of CEO education have been linked to superior levels of cognitive complexity (Wally and Baum, 1994), more innovation (Wiersema and Bantel, 1992), more sustained investment in a firm (Bertrand and Schoar, 2003), and a facility to make valuable alliances (Palmer and Barber, 2001). All of these outcomes may lead to sustainable superior firm performance.

Finally, as we shall argue below, many Ivy-selected CEOs are unlikely to be able to appropriate all of their incremental rents because, under specific conditions, information asymmetries conceal their value to potential bidders and asset specificity reduces their transferability (Hatch and Dyer, 2004; Holcomb *et al.*, 2009; Lippman and Rumelt, 2003).

*Hypothesis 1: Firms run by CEOs selected by Ivy League schools will show superior sustained performance, even over other high-performing CEOs.*

### Undergraduate versus graduate training

We do not expect that all forms of a CEO's education will be equally valuable to a firm's performance. Education varies in the types of students it selects, and hence their suitability to the task of outstanding general management. Undergraduate programs at Ivy schools select for general intelligence and past achievements, academic and nonacademic alike (Hernández, 1997). These programs also seek out those with analytical ability and social skills (Zhang, 2012). It is such subtle skills and talents—and the relationships developed among those who possess them—that are most relevant to the demands of a CEO position, and perhaps less visible to bidders outside the firm (Lazear, 2001; Lazear and Shaw, 2007). They foster creativity, problem-solving ability, communication skills, and the capacity to form useful social connections. When competing against other very high-achieving CEOs, those skills may be especially valuable.

By contrast, graduate programs base selection for admission more on general cognitive intelligence (essentially IQ) and competency within a specialized field of knowledge. They also constitute more subject- or discipline-focused training remote from the job of CEO (Hernández, 1997). Selection for these talents is more apt to be useful within a specialized field than in dealing with the notoriously

varied, ill-structured, and socially complex challenges confronting an executive. Moreover, high IQ and an advanced knowledge of physics, law, or finance will get a CEO only so far, especially if the object is to outperform creative, motivated, well-connected, and socially accomplished competitors.<sup>2</sup> In short, CEOs selected for Ivy undergraduate degrees will be more likely to outperform other high-achieving CEOs than those who have an Ivy graduate degree.<sup>3</sup>

*Hypothesis 2: The performance advantage of Ivy League human capital selection will accrue mostly to CEOs with Ivy undergraduate as opposed to graduate degrees.*

### Selection and educational versus experience effects

If an executive's performance were truly due to education and selection for talent, we would expect that to be reflected relatively early in a career, before other factors come into play. Less-seasoned CEOs may have to rely more on their natural talent and education as they often lack the reputation, connections, and political clout accruing to older executives (Hambrick and Fukutomi, 1991).<sup>4</sup> CEOs also are more likely to change their strategies and make their mark in the first half than in the last half of their tenures—thereby having more influence on the performance of their companies (Henderson *et al.*, 2006; Wiersema and Bantel, 1992). Finally, potential bidders for talent are less apt to recognize the value of a young CEO, thereby reducing chances of rent appropriation. By contrast, after many years on the job, it is very likely that experience as a manager and the connections one builds in the normal course of a career may come to matter more than one's formal education and early talent, however exalted, especially when

<sup>2</sup> Specialists such as investment bankers, lawyers, or doctors often appropriate their rents.

<sup>3</sup> We do not wish to impugn the merits of Ivy graduate education, merely to suggest that they represent a type of training perhaps more suitable to particular specialties than general management at the highest level of achievement.

<sup>4</sup> By contrast, older CEOs may be so late in their job histories and having been subject to a wide variety of career and personal influences that they no longer exploit the training and contacts they received at school. Older CEOs also tend to be less likely to use their discretion to shape the strategies of their organizations (Miller & Shamsie, 2001).

competing against an outstanding cohort with years of enriching experience.

*Hypothesis 3: The firm performance advantages of Ivy League human capital selection will be strongest earlier in CEO careers.*

### **Firm context: small versus large firms**

If the selective education of a CEO were truly to have an effect, it would be most apt to reveal itself where the CEO has the most influence on firm outcomes—specifically, in smaller rather than larger companies.<sup>5</sup> First, CEOs have more discretion to influence a company more quickly and more profoundly in smaller firms (Finkelstein *et al.*, 2008). There are fewer administrative levels to remove them from direct command, and less bureaucracy to slow them down. Moreover, in smaller companies, a prestigious CEO might confer legitimacy upon a firm, thereby enhancing its access to resources. Smaller firms are also subject to significant competitive challenges because of their size, having to formulate creative niche strategies that benefit from the superior talent signaled or conferred by an Ivy degree (Porter, 1990). Finally, modest CEO visibility in a small firm may impede CEO rent appropriation.

By contrast, larger firms have been shown to be more bureaucratic, rule bound, and thus more sluggish to adapt (Miller and Chen, 1994). They also are apt to have amassed significant political and financial resources that give them power in the marketplace. Thus, they may benefit less dramatically from the contributions of a capable CEO. CEOs of large firms may also be more visible to outside bidders for talent—and hence subject to rent appropriation.

*Hypothesis 4: The firm performance advantages of Ivy League human capital selection will be strongest in smaller firms.*

### **Why does an Ivy degree matter: connections versus competency?**

Some have argued that Ivy League schools do not so much signal talent or provide an excellent education

<sup>5</sup> If the Ivy effect were strong in large firms and weak in small ones, this might suggest that richly endowed, high-performing firms are more apt to acquire costly Ivy grads. Here, performance might be driving Ivy selection rather than vice versa.

as confer the social networks to sustain CEOs despite modest levels of competency (Coleman, 1988; Judge *et al.*, 1995; Newcomer, 1955; Useem and Karabel, 1986). In other words, the superior performance associated with an Ivy degree may be more due to social contacts than competency.

It is well established that, up until about 1960, Ivy League schools based admission in part on the social connections and wealth of the parents of their applicants (Farnum, 1990; Hernández, 1997; Kingston & Lewis, 1990; Palmer and Barber, 2001). That would not only give a university prestige, but might attract potential donors and prominent entrants with whom their less economically privileged cohorts might interact to enhance social mobility. Beginning in the 1960s, however, admission criteria at the Ivy schools became more reliant upon applicants' intelligence and achievement (Kingston & Lewis, 1990; Zhang, 2012).

It might be argued, therefore, that if social connections mattered more to business success than talent, then graduates of the early era Ivy classes would do better than graduates from more recent years. Conversely, talent might be shown to be more important to performance if the later classes did better than the earlier ones. Thus, two opposing hypotheses:

*Hypothesis 5a: Social Capital Hypothesis: The older/well connected Ivy cohort will outperform.*

*Hypothesis 5b: Human Capital Hypothesis: The more recent/talented Ivy cohort will outperform.*

## **METHOD**

We chose to study situations in which a CEO's human capital was deemed by experts (editors of major business periodicals) to account for superior firm performance. Thus, we selected a sample in which outstanding managerial impact was established by (1) the highest level of executive influence, namely the CEO position, (2) significant organizations that pose a substantive managerial challenge for the leader, (3) publicly traded organizations subject to oversight and monitoring by investors, and (4) selection for a complimentary cover story by a top-three circulation U.S. business magazine, namely, *Business Week*, *Fortune*, or *Forbes*. This last stipulation ensured that our Ivy League CEOs

would be compared to a cohort of high achievers. We chose as standards of evaluation the market valuations of the firm, thereby avoiding the accounting manipulations to which financial returns measures are subject. Moreover, to handle endogeneity concerns, we examined the relative *sustainability* (i.e., changes in) valuations *after* the CEOs had appeared on the cover.

Our period of analysis was 1970–2008, during which we coded every issue of the above three journals to identify every cover story about a CEO of a firm for which financial information was available in the Compustat database. We then identified covers that were positive—those in which a CEO’s achievements were praised. Neutral stories were deleted from the sample. The coding was straightforward as the positive stories celebrated the CEOs and their firms. In all, we identified 502 positive covers during the period, but dropped duplicate covers for the same CEOs in a given period, resulting in a final 444 observations.

To ascertain the accuracy of classifications, a random sample of 50 covers was chosen from our journals, which included those reporting poor, ambiguous, or celebrated CEO behavior and performance, and we subjected these to an independent rating process. In only one case was there disagreement, as one rater deemed a positive cover as being “somewhat neutral.” Thus, interrater agreement was very acceptable.

To confirm the superior performance of our CEOs with positive covers, we report their industry median and year-adjusted performance relative to firms in the Compustat database in their profitability, growth, and market-to-book valuations over the comparable time period.

## Variables

Our dependent variables were both the levels and changes in firm market valuation as assessed by Tobin’s Q. Tobin’s Q reflects the evaluation by the market of all of the information about a company available to investors and, as such, is a better measure of performance than profit-based indexes such as return on assets, which are more easily subject to manipulation by managers (Shleifer and Vishny, 1997; Villalonga and Amit, 2006). Tobin’s Q also reflects investors’ evaluations of the prospects of the company. We examined average valuations for three-, two-, and one-year intervals pre- and post-cover—in other words, for seven-,

five-, and three-year market valuation averages centered on the publication year. In order to evaluate the *sustainability* of the superior returns, we also assessed changes in Tobin’s Q for three-, two-, and one-year intervals after the cover to reduce chances of endogeneity and establish robustness. The dependent variables were Winsorized at the 5 percent level to remove outliers.

We assessed each CEO-cover firm according to the following variables. First, we examined some attributes of the CEO: specifically, a binary variable to reflect whether or not the CEO either possessed an Ivy League degree or had gained admission to an Ivy League school. For testing Hypotheses 2–5, respectively, we measured degree level, number of employees, CEO age, and year of graduation. To control for possible gender bias, we incorporated the gender of the CEO in all of our models (Martelli and Abels, 2010). Also, because founders have been shown to outperform (Miller *et al.*, 2007; Villalonga and Amit, 2006), we controlled for a CEO’s founder status. To control for training in management, we included a binary variable reflecting possession of a business degree. All CEO-related data were hand collected from Who’s Who, Notable Names Database (NNDB Mapper), company websites, and other Internet sources.

In all analyses, we also controlled for industry at the two-digit SIC level using Compustat figures, as well as the year in which the cover appeared. Moreover, in predicting post-cover change in performance, we incorporated the level of Tobin’s Q in the year prior to the cover to take into account mean reverting tendencies (DeBondt and Thaler, 1985; Fama and French, 1988). The analysis of post-cover changes in performance reveals the extent to which CEOs with an Ivy degree are able to sustain their superior performance relative to other cover CEOs whose achievements had also been celebrated with positive covers.

## Analyses

Table 1 compares the performance of our sample of successful cover CEO firms versus Compustat firms with assets above \$25 million, adjusted for year and industry median performance. The correlation matrix is presented in Table 1, panel B, and the regression models with all controls are presented in Tables 2–6. In all instances, clustering was performed at the CEO level (Peterson, 2009). Tables 3–6 contain the subsample analyses; for

Table 1. Summary statistics

Panel A. Cover firms vs. Compustat firms (industry median and year adjusted)		Industry median adjusted											
	<i>n</i>	Mean											<i>t</i>
Total assets	444	35,875											12.28
Tobin's Q	444	2.117											6.66
Asset growth	444	0.153											9.84

Panel B. Summary statistics and correlation matrix

	<i>n</i>	Mean	<i>S.D.</i>	1	2	3	4	5	6	7	8	9	10	11	12
1 <i>N</i> employees (000)	435	89.774	163.751	1											
2 Ivy League	444	0.331	0.456	-0.037	1										
3 Master & above	444	0.548	0.548	0.011	0.065	1									
4 Management degree	444	0.291	0.455	0.183	0.132	0.399	1								
5 Executive age	444	53.4	9.3	0.184	-0.059	0.12	-0.024	1							
6 Female	444	0.061	0.23	-0.058	0.043	0.056	0.110	-0.159	1						
7 Founder	444	0.348	0.477	-0.273	0.052	-0.205	-0.197	-0.289	0.028	1					
8 <i>Q</i> (7-year average)	374	2.931	3.093	-0.188	0.062	-0.094	-0.078	-0.342	0.105	0.274	1				
9 <i>Q</i> (5-year average)	391	3.251	4.106	-0.18	0.044	-0.047	-0.083	-0.334	0.128	0.233	0.955	1			
10 <i>Q</i> (3-year average)	415	3.323	4.609	-0.164	0.015	-0.005	-0.087	-0.298	0.052	0.2	0.859	0.901	1		
11 $\Delta Q (t_3 - t_1)$	406	-0.42	1.346	0.044	0.085	0.004	-0.063	0.172	-0.048	-0.164	-0.208	-0.227	-0.311	1	
12 $\Delta Q (t_2 - t_1)$	411	-0.397	1.349	0.038	0.071	0.003	-0.038	0.152	-0.062	-0.136	-0.188	-0.215	-0.274	0.88	1
13 $\Delta Q (t_1 - t_{-1})$	415	-0.336	1.167	0.059	0.077	0.039	-0.032	0.133	-0.09	-0.107	-0.142	-0.117	-0.12	0.752	0.796

Correlations above 0.12 are significant at beyond the 0.05 level.

Table 2. Ivy impact on firm market valuation and change in valuation

Panel A. Ivy League education and valuation level			
	Tobin's Q <sub>3</sub> = 3-year post and prior (7-year average)	Tobin's Q <sub>2</sub> = 2-year post and prior (5-year average)	Tobin's Q <sub>1</sub> = 1-year post and prior (3-year average)
Ivy League school	0.456* (0.237)	0.402* (0.229)	0.445* (0.238)
Management degree	-0.313* (0.182)	-0.320* (0.178)	-0.351* (0.183)
Female	-0.332 (0.365)	-0.165 (0.384)	-0.027 (0.388)
Executive age	-0.019 (0.013)	-0.023* (0.013)	-0.021 (0.013)
Founder	0.456* (0.262)	0.422* (0.253)	0.413 (0.254)
<i>N</i> employees (log)	-0.166** (0.073)	-0.164** (0.071)	-0.130* (0.073)
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Observations	367	384	406
<i>R</i> -squared	0.66	0.67	0.64
Panel B. Ivy League education and valuation sustainability			
	$\Delta Q (t_3 - t_{-1})$ 3-year post-prior	$\Delta Q (t_2 - t_{-1})$ 2-year post-prior	$\Delta Q (t_1 - t_{-1})$ 1-year post-prior
Ivy League school	0.393** (0.163)	0.400** (0.171)	0.382*** (0.145)
Management degree	-0.406*** (0.153)	-0.371** (0.152)	-0.290** (0.127)
Female	-0.059 (0.294)	0.016 (0.311)	-0.008 (0.258)
Executive age	-0.004 (0.010)	-0.007 (0.009)	-0.006 (0.008)
Founder	0.057 (0.164)	0.163 (0.181)	0.239 (0.155)
<i>N</i> employees (log)	-0.036 (0.057)	-0.040 (0.060)	0.021 (0.054)
Q <sub>t-1</sub>	-0.502*** (0.057)	-0.523*** (0.063)	-0.388*** (0.047)
Year dummy	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Observations	397	403	406
<i>R</i> -squared	0.55	0.52	0.50

Standard errors are in parentheses, and \*, \*\*, and \*\*\* represent statistical significance levels at 0.10, 0.05, and 0.01, respectively, under a two-tailed test.

Table 3, the sample was split according to whether a CEO had obtained a graduate or an undergraduate Ivy degree, for Tables 4 and 5, subsamples were defined by median bifurcation according to CEO age and firm size, respectively; for Table 6, the sample was divided according to the 1960 year of graduation.

## FINDINGS

Table 1, panel A shows that our cover firms significantly outperformed the Compustat firms in asset growth and in Tobin's Q. This was indeed a high performance sample of companies, and thus

Table 3. Ivy and education

Panel A. Valuation level						
	Master and above			Bachelor and below		
	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>
Ivy League school	-0.005 (0.174)	-0.074 (0.179)	-0.051 (0.200)	1.041** (0.411)	0.928** (0.428)	0.953** (0.461)
Management degree	-0.181 (0.201)	-0.166 (0.201)	-0.288 (0.227)	-0.810** (0.369)	-0.869** (0.354)	-0.785** (0.353)
Female	0.383 (0.852)	0.456 (0.776)	0.608 (0.875)	-0.672 (0.671)	-0.641 (0.628)	-0.326 (0.509)
Executive age	0.007 (0.012)	0.008 (0.013)	0.006 (0.014)	-0.036 (0.023)	-0.043** (0.021)	-0.037* (0.020)
Founder	-0.112 (0.299)	-0.040 (0.286)	-0.091 (0.302)	0.805* (0.425)	0.673* (0.403)	0.652* (0.391)
N employees (log)	-0.291*** (0.098)	-0.253*** (0.089)	-0.233** (0.105)	-0.061 (0.135)	-0.087 (0.127)	-0.056 (0.114)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	189	196	203	178	188	203
R-squared	0.74	0.77	0.73	0.75	0.74	0.71

  

Panel B. Valuation sustainability						
	Master and above			Bachelor and below		
	$\Delta Q(t_3 - t_{-1})$	$\Delta Q(t_2 - t_{-1})$	$\Delta Q(t_1 - t_{-1})$	$\Delta Q(t_3 - t_{-1})$	$\Delta Q(t_2 - t_{-1})$	$\Delta Q(t_1 - t_{-1})$
Ivy League school	0.039 (0.159)	0.066 (0.173)	0.082 (0.157)	0.709* (0.361)	0.628* (0.350)	0.732** (0.341)
Management degree	-0.320 (0.217)	-0.220 (0.218)	-0.218 (0.173)	0.086 (0.323)	-0.031 (0.315)	-0.118 (0.309)
Female	0.765 (0.487)	0.808 (0.621)	0.495 (0.492)	-0.632 (0.600)	-0.459 (0.730)	-0.081 (0.620)
Executive age	0.013 (0.013)	0.009 (0.013)	0.010 (0.013)	-0.009 (0.018)	-0.009 (0.016)	-0.005 (0.017)
Founder	-0.372 (0.286)	-0.211 (0.337)	-0.147 (0.245)	0.118 (0.344)	0.130 (0.368)	0.493* (0.297)
N employees (log)	-0.066 (0.070)	-0.138* (0.071)	-0.027 (0.082)	-0.090 (0.120)	-0.073 (0.117)	0.014 (0.104)
Q <sub>t-1</sub>	-0.611*** (0.076)	-0.684*** (0.078)	-0.493*** (0.058)	-0.448*** (0.092)	-0.437*** (0.101)	-0.365*** (0.088)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	201	203	203	196	200	203
R-squared	0.68	0.69	0.66	0.62	0.51	0.52

Standard errors are in parentheses, and \*, \*\*, and \*\*\* represent statistical significance levels at 0.10, 0.05, and 0.01, respectively, under a two-tailed test.

any outperformance by Ivy CEOs represented an impressive achievement.

We also wished to compare the prevalence of Ivy CEOs in our 40-year cover sample to those in Fortune 500 firms, a comparable group of companies in visibility and scale. We used various published sources to obtain the Fortune 500 data, including Who's Who, Keiser (2004), and *Forbes*.

On average, during this interval 23.4 percent of the CEOs of Fortune 500 firms had Ivy degrees, whereas 33.1 percent of our cover sample comprised Ivy CEOs—clearly a significant overrepresentation in a sample of very high achievers.

In Table 1, panel B, the mean for Q<sub>7</sub> is smaller than Q<sub>5</sub>, which is smaller than Q<sub>3</sub> (the subscripts here refer to the number of years in the average).



Table 4. Ivy and executive age

Panel A. Valuation level						
	Age < 55			Age ≥ 55		
	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>
Ivy League school	0.675** (0.310)	0.512* (0.307)	0.501 (0.305)	0.268 (0.292)	0.292 (0.295)	0.310 (0.296)
Management degree	-0.123 (0.275)	-0.096 (0.264)	-0.180 (0.304)	-0.515** (0.240)	-0.549** (0.246)	-0.533** (0.229)
Female	-0.365 (0.369)	-0.239 (0.372)	-0.045 (0.416)			-1.040 (0.829)
Executive age	-0.022 (0.026)	-0.020 (0.026)	-0.022 (0.028)	-0.012 (0.027)	-0.021 (0.024)	-0.018 (0.025)
Founder	0.715* (0.362)	0.727** (0.325)	0.833** (0.370)	-0.120 (0.301)	-0.157 (0.297)	-0.184 (0.291)
N employees (log)	-0.088 (0.119)	-0.070 (0.098)	-0.016 (0.103)	-0.193* (0.101)	-0.218** (0.099)	-0.234** (0.095)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	184	197	216	183	187	190
R-squared	0.74	0.75	0.70	0.69	0.68	0.69

  

Panel B. Valuation sustainability						
	Age < 55			Age ≥ 55		
	Δ Q (t <sub>3</sub> - t <sub>-1</sub> )	Δ Q (t <sub>2</sub> - t <sub>-1</sub> )	Δ Q (t <sub>1</sub> - t <sub>-1</sub> )	Δ Q (t <sub>3</sub> - t <sub>-1</sub> )	Δ Q (t <sub>2</sub> - t <sub>-1</sub> )	Δ Q (t <sub>1</sub> - t <sub>-1</sub> )
Ivy League school	0.615** (0.252)	0.767*** (0.264)	0.644*** (0.246)	0.158 (0.159)	-0.039 (0.179)	0.086 (0.174)
Management degree	-0.531** (0.246)	-0.421* (0.248)	-0.465** (0.204)	-0.472*** (0.176)	-0.348* (0.177)	-0.144 (0.180)
Female	0.072 (0.373)	0.156 (0.362)	0.186 (0.335)	2.329*** (0.619)	-2.045*** (0.547)	-1.110** (0.470)
Executive age	-0.022 (0.029)	-0.007 (0.028)	-0.000 (0.025)	-0.043** (0.020)	-0.041** (0.017)	-0.014 (0.018)
Founder	-0.121 (0.314)	0.270 (0.363)	0.482* (0.261)	0.227 (0.198)	0.198 (0.203)	0.097 (0.197)
N employees (log)	-0.044 (0.094)	-0.060 (0.097)	0.001 (0.082)	0.037 (0.067)	0.008 (0.082)	0.059 (0.102)
Q <sub>t-1</sub>	-0.518*** (0.077)	-0.595*** (0.096)	-0.453*** (0.061)	-0.401*** (0.068)	-0.302*** (0.093)	-0.257*** (0.076)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	209	212	216	188	191	190
R-squared	0.63	0.61	0.56	0.72	0.65	0.63

Standard errors are in parentheses, and \*, \*\*, and \*\*\* represent statistical significance levels at 0.10, 0.05, and 0.01, respectively, under a two-tailed test.

This indicates that peak performance is centered on the cover event, an inference also supported by the values for the changes in Q in the post-cover time period. We exploit this pattern later in this section when we study sustainability of performance following the cover event.

The focus of our research, however, was to assess how well Ivy CEOs might do in this impressive

sample: Is it simply that their prestigious degree gets them into good jobs and brings them favorable attention from the press, or do they actually out-perform within this select cover appearance group? Tables 2–6 provide evidence of when and where the latter occurs.

Table 2 indicates that CEOs with Ivy League degrees were associated with superior firm market

Table 5. Ivy and firm size

Panel A. Valuation level						
	Small firm (number of employees below median)			Big firm (number of employees above median)		
	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>
Ivy League school	1.317*** (0.347)	1.091*** (0.373)	1.028*** (0.335)	-0.109 (0.210)	-0.102 (0.213)	-0.103 (0.219)
Management degree	-0.266 (0.336)	-0.235 (0.282)	-0.170 (0.293)	-0.246 (0.185)	-0.251 (0.188)	-0.214 (0.195)
Female	-0.541 (0.555)	-0.084 (0.550)	0.352 (0.489)	-0.701 (0.480)	-0.738 (0.474)	-0.663 (0.483)
Executive age	-0.024 (0.023)	-0.029 (0.021)	-0.031* (0.018)	-0.023* (0.014)	-0.023 (0.014)	-0.023 (0.014)
Founder	0.428 (0.437)	0.318 (0.348)	0.213 (0.327)	0.203 (0.349)	0.232 (0.354)	0.417 (0.377)
N employees (log)	-0.033 (0.148)	-0.018 (0.129)	0.017 (0.117)	-0.456*** (0.152)	-0.451*** (0.153)	-0.448*** (0.159)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	156	173	192	211	211	214
R-squared	0.78	0.75	0.72	0.71	0.71	0.71

  

Panel B. Valuation sustainability						
	Small firm (number of employees below median)			Big firm (number of employees above median)		
	$\Delta Q(t_3 - t_{-1})$	$\Delta Q(t_2 - t_{-1})$	$\Delta Q(t_1 - t_{-1})$	$\Delta Q(t_3 - t_{-1})$	$\Delta Q(t_2 - t_{-1})$	$\Delta Q(t_1 - t_{-1})$
Ivy League school	0.713** (0.284)	0.731** (0.291)	0.552* (0.283)	0.023 (0.159)	-0.045 (0.151)	0.152 (0.142)
Management degree	-0.680** (0.331)	-0.625* (0.354)	-0.343 (0.260)	-0.192 (0.163)	-0.258* (0.152)	-0.242 (0.150)
Female	-0.476 (0.465)	-0.130 (0.516)	0.095 (0.324)	0.245 (0.404)	0.283 (0.411)	-0.153 (0.429)
Executive age	-0.025* (0.013)	-0.030** (0.014)	-0.020 (0.013)	0.009 (0.011)	0.012 (0.012)	0.002 (0.011)
Founder	-0.142 (0.235)	-0.004 (0.287)	0.194 (0.226)	-0.161 (0.277)	-0.165 (0.266)	-0.006 (0.287)
N employees (log)	0.173 (0.106)	0.175 (0.110)	0.242** (0.099)	-0.300** (0.116)	-0.270*** (0.100)	-0.187* (0.103)
Q <sub>t-1</sub>	-0.398*** (0.082)	-0.464*** (0.089)	-0.353*** (0.086)	-0.576*** (0.077)	-0.500*** (0.079)	-0.426*** (0.072)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	184	190	192	213	213	214
R-squared	0.65	0.58	0.57	0.73	0.70	0.64

Standard errors are in parentheses, and \*, \*\*, and \*\*\* represent statistical significance levels at 0.10, 0.05, and 0.01, respectively, under a two-tailed test.

valuations and a greater ability to sustain those valuations than the comparison group of cover CEOs without an Ivy association. Thus, Hypothesis 1 receives support for intervals surrounding the covers of seven-, five-, and three-year average Tobin's

Q ratios, and also for changes in Tobin's Q one, two, and three years post-cover. However, the subsample analyses will tell a more nuanced story.

We note from Table 2, panel B that the changes in Q-ratios are negative and statistically significant,

Table 6. Era of graduation

Panel A. Valuation level						
	Early years (graduation year < 1960)			Later years (graduation year ≥ 1960)		
	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>
Ivy League school	0.453 (0.322)	0.508 (0.319)	0.526 (0.328)	0.827** (0.331)	0.720** (0.332)	0.721** (0.339)
Management degree	-0.419** (0.203)	-0.480** (0.196)	-0.485** (0.200)	-0.310 (0.324)	-0.231 (0.309)	-0.331 (0.319)
Female				-0.584 (0.387)	-0.468 (0.389)	-0.188 (0.392)
Executive age	0.008 (0.021)	-0.009 (0.019)	-0.010 (0.020)	-0.029 (0.024)	-0.027 (0.026)	-0.026 (0.025)
Founder	0.018 (0.289)	-0.046 (0.275)	-0.027 (0.286)	0.353 (0.371)	0.483 (0.363)	0.500 (0.361)
N employees (log)	0.006 (0.079)	-0.029 (0.081)	-0.045 (0.084)	-0.283** (0.109)	-0.238** (0.102)	-0.163 (0.103)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	180	184	186	188	201	221
R-squared	0.67	0.64	0.65	0.68	0.68	0.63

  

Panel B. Valuation sustainability						
	Early years (graduation year < 1960)			Later years (graduation year ≥ 1960)		
	Δ Q (t <sub>3</sub> - t <sub>1</sub> )	Δ Q (t <sub>2</sub> - t <sub>1</sub> )	Δ Q (t <sub>1</sub> - t <sub>1</sub> )	Δ Q (t <sub>3</sub> - t <sub>1</sub> )	Δ Q (t <sub>2</sub> - t <sub>1</sub> )	Δ Q (t <sub>1</sub> - t <sub>1</sub> )
Ivy League school	0.270 (0.165)	0.224 (0.170)	0.255 (0.183)	0.474* (0.261)	0.566** (0.282)	0.633*** (0.229)
Management degree	-0.479** (0.201)	-0.280* (0.169)	-0.243 (0.174)	-0.414 (0.257)	-0.410 (0.272)	-0.322 (0.208)
Female				-0.043 (0.331)	0.071 (0.329)	-0.056 (0.293)
Executive age	-0.003 (0.016)	-0.011 (0.015)	-0.000 (0.014)	-0.006 (0.019)	0.000 (0.022)	0.002 (0.018)
Founder	-0.035 (0.269)	-0.210 (0.231)	-0.108 (0.258)	0.137 (0.283)	0.343 (0.328)	0.456* (0.236)
N employees (log)	0.039 (0.084)	0.011 (0.084)	0.083 (0.114)	-0.077 (0.086)	-0.089 (0.091)	-0.035 (0.074)
Q <sub>t-1</sub>	-0.395*** (0.075)	-0.396*** (0.082)	-0.313*** (0.089)	-0.538*** (0.077)	-0.582*** (0.086)	-0.454*** (0.057)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	183	187	186	215	217	221
R-squared	0.68	0.60	0.64	0.58	0.55	0.51

Standard errors are in parentheses, and \*, \*\*, and \*\*\* represent statistical significance levels at 0.10, 0.05, and 0.01, respectively, under a two-tailed test.

indicating a tendency for mean reversion (also see related means in Table 1, panel B). This suggests that perhaps luck played an important role in our CEO's success (Poterba and Summers, 1988). However, the positive coefficients for Ivy League education in Table 2B show that Ivy League CEOs are better able to avoid reversing their pre-cover event valuations, and hence are inconsistent with fortune

alone driving performance. The same cannot be said of non-Ivy league CEOs.

According to Hypothesis 2, we expected that undergraduate degrees from selective Ivy schools would be more conducive to superior performance than specialized graduate training. Table 3 bears this out, thus confirming our second hypothesis. Indeed, the firms of CEOs with undergraduate

Ivy exposure outperformed others, whereas the firms of CEOs with graduate Ivy degrees did not. We present the subsample findings as they more precisely demonstrate just how strong the relationship between Ivy training and performance is within the different educational groups. Furthermore, in the difference regressions (panel B), only the Ivy League undergraduate-degree CEOs displayed superior performance, with the strength of the coefficients offsetting the mean reversion indicated by the coefficient for lagged Q ratios. These findings of the subgroup analyses were fully confirmed by interaction analyses on the total sample using a product of Ivy and a dummy that distinguished education at, above, or below the Master's level (analyses are available from the authors).

Hypotheses 3 and 4, respectively, suggested that Ivy selection would be more useful to performance earlier in CEOs' careers, and where firms were relatively small. From Tables 4 and 5, we see that these hypotheses were supported. Ivy positive effects were strongest for younger CEOs and those in smaller firms. These findings were also obtained for analyses of the entire sample using  $Ivy \times size$ , and  $Ivy \times CEO$  age interaction dummies.

Finally, Table 6 relating to Hypotheses 5a and b compares eras of graduation to assess talent versus social capital Ivy effects. We found that an Ivy degree granted before 1960 did not confer any performance advantage; the opposite was true for degrees granted after that date. Thus, the value from an Ivy degree is derived not so much from the social capital conferred during the earlier era of social elite selection, but rather the talent associated with selection in the more recent meritocratic era. This, however, is only a suggestive result as our study cannot distinguish conclusively the effects of selection for talent, the knowledge imparted by education, and the social capital accruing to an Ivy cohort.

Some of our control variables showed interesting results. For example, a management degree did not raise market valuations and was associated with more rapid post-cover declines in performance. We also found that founder firms outperformed. This is not surprising as firms run by their founders are comparatively young, and for them to warrant a cover story from a prominent national business magazine suggests that these executives have brought their firms to national attention in an unusually short span of time. Founder firms are also held to be relatively free of agency problems (Miller

*et al.*, 2007). Surprisingly, the dummy variable for female showed a negative coefficient. It may be that the relative paucity of female CEOs garners them preferential treatment in the cover decision by magazine publishers. A detailed examination of such gender biases is left for future studies.

### Robustness

We employed several techniques to establish the robustness of our findings. First, we examined both the level and the changes in market valuation (Tobin's Q) as these might be influenced by a CEO's having an Ivy degree. We also examined three different averages for the level of Q and three different intervals for the changes in Q. There was considerable convergence in these findings. Moreover, we tried dropping management degrees from the analyses to ascertain whether the same findings would obtain without the control for formal administrative training. In virtually all cases, the findings did not change. We also split the sample into different decades or 20-year intervals to determine whether an Ivy degree was worth more during a given cover decade. We could detect no differences in this respect. Nor were there any differences in the ages (52.9 and 53 years) at which Ivy vs. non-Ivy CEOs appeared on the covers. Finally, the Ivy advantage did not seem to differ between industries with different levels of volatility. In short, the Ivy advantage remained more or less the same except for the variables used to define our subsample analyses of Tables 3–6, namely, the level of the degree, the age of the CEO, the size of the firm, and the era of graduation.

Some authors claim that the Ivy list should be expanded to include a few other prestigious universities (Zhang, 2012). Thus, to further substantiate our findings, we added CEOs with Stanford and University of Chicago educations to an "expanded Ivy" list. All statistically significant results were robust to these additions. Finally, as Tobin's Q may be influenced by intangible assets, we reran all analyses incorporating the common proxy for that variable consisting of a composite of R&D/sales and advertising/sales taken from Compustat. The results did not change in any material way.

Arend (2006) argues that, in order to qualify as a resource according to RBV definitions, it should result in superior performance vis-à-vis other organizations for a period of "several consecutive years." To establish how long Ivy CEOs'

performance continued to lead that of the non-Ivy cover CEOs, we extended our analyses beyond the three years of Table 2 to four, five, six, and seven years (at which point the sample became quite small). Superior performance was maintained at the four-, five-, and six-year marks, but not in year 7, perhaps because by then outperformance is priced in by the market. Thus, the Ivy advantage is indeed very durable.

We also wished to assess whether the Ivy advantage would disappear when the Ivy CEO left the firm. Thus, we performed comparisons for firms whose Ivy CEOs are no longer present after years 4, 5, 6, and 7 of our analyses. Only in year 4 did the formerly Ivy firm display superior performance—which then disappeared in all subsequent years. Clearly, performance in our firms was linked to the presence of the Ivy CEO. All robustness analyses are available from the authors.

Finally, we tried to tease out selection vs. education effects by analyzing a sample of Ivy dropouts. Although our dropout sample was too small to show statistical significance, the firms of dropout CEOs did no worse than the firms of the Ivy graduates. Nor was the statistical significance of our findings influenced by whether or not we included dropouts in our analysis. Thus, admission-based talent screening may be a key role performed by Ivy universities.

## DISCUSSION

Recent studies have found a decline in the prevalence of CEOs from Ivy League universities (Keiser, 2004; Martelli and Abels, 2010). Some authors have deemed this a product of the ascendance of a meritocracy whereby job performance rather than educational advantage is responsible for promotion and firm performance (Judge *et al.*, 1995; Martelli and Abels, 2010; Sowell, 2008). Yet, if scholars of human capital are correct, and high quality training does enhance the value of human capital (Becker, 1964; Cooper, Gimeno-Gascon, and Woo, 1994; Flamholtz and Lacey, 1981), then there may be strategic value to an Ivy education. Moreover, Ivy universities perform early-stage screening for outstanding talent and motivation (Zhang, 2008). And, despite our findings regarding the meritocratic era, Ivy schools still attract entrants from rich, well-connected families, and that may give their graduates social capital (Palmer and Barber, 2001).

Our finding that Ivy CEOs do better in early career, in small companies, and where CEO-relevant undergraduate program-related skills apply suggests that an Ivy-connection enhances performance where the CEO has less experience, ample discretion, an especially critical role, and where there is less risk of rent appropriation. Indeed, the positive effects of the characteristics emphasized by undergraduate programs suggest that there may be a significant executive capability component linked to an Ivy association. Moreover, that more recent graduates did better than those from a prior era suggests that most of the value of an Ivy degree comes from selection or education for talent rather than social connections.

In summary, under specific conditions, Ivy-selected CEOs can indeed be considered a valuable resource according to the tenets of the resource-based view. Even within our sample of high-performing CEOs who made the cover of national business magazines, our Ivy CEOs showed their superiority in three ways. First, they were significantly more likely to appear in this high-performing sample than their prevalence among Fortune 500 companies would have predicted. Second, they outperformed in the market valuation accorded their companies by investors—a tough hurdle given the nature of the cover comparison sample. Third, and most important, they sustained their superior post-cover valuations longer than other cover CEOs. Thus, if we ask whether human capital as created or signaled by a particular training environment can contribute to sustainable rents—the answer is “yes,” under the conditions we have specified.

### Limitations and suggestions for further research

We remain uncertain of the exact sources of firm value associated with an Ivy undergraduate education—whether it be from astute selection, education, or social capital born of networking. Thus, it would be useful for researchers to engage in finer-grained research to establish the relative contributions to executive achievement of training, social networks, and exacting selection. Also, whereas we studied Ivy-trained CEOs within a group of high performers to determine their status as resources, in order to probe the generality of our findings, future researchers may usefully choose a less selective sample and other early markers

of talent. Finally, we have in no way shown that any or all types of education constitute a resource advantage: Ivy educations are especially selective. It remains unanswered just how broadly we may expand the list of universities and find the same benefit. That question, too, presents an opportunity for further research.

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