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CEO Education and Firm Performance: Evidence from Corporate Universities

Hai Long Nguyen and Pengda Fan * 

College of International Management, Ritsumeikan Asia Pacific University, 1-1 Jumonjibaru Beppu, Oita 874-8577, Japan

* Correspondence: p-fan@apu.ac.jp

Abstract: Corporate universities are increasingly being established in response to corporate dissatisfaction with the knowledge provided by traditional universities. While some argue that they may pose the greatest threat to traditional universities, others propose that corporate universities might provide better undergraduate-level education than traditional universities. To this end, this research tries to answer the following research question: can integrating corporation education into traditional universities provide better educational outcomes? Using a sample of 40,563 firm-year observations from 2001 to 2019 and exploiting the unique setting of Japanese corporate universities, the authors find that the CEOs who are graduates of corporate universities significantly underperform compared to their counterparts graduating from traditional universities. The results are robust under various alternative estimations, such as general method of moments (GMM) IV regressions and propensity score matching. Overall, the results indicate that integrating corporation needs into traditional higher education will lead to lower individual productivity.

Keywords: CEO education; corporate university; firm performance



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1. Introduction

It has been well established that CEO characteristics matter for a wide range of corporate decisions (Bernile et al. 2017; Bertrand and Schoar 2003; Mackey 2008). Among the various personal attributes of a CEO, educational attainment has been confirmed to be an important factor of management style in extant studies (Hambrick and Mason 1984). However, the literature provides mixed evidence regarding the impact of CEO education on firm performance (Miller et al. 2015; King et al. 2016). One potential reason is that the relationship between CEO education and firm performance may differ by the type of educational institution. Our paper contributes to this literature stream by investigating a particular type of educational institution, the corporate university.

Corporate universities are increasingly being established in response to corporate dissatisfaction with the knowledge provided by traditional universities (Cappiello and Pedrini 2017).¹ As of 2015, there were around 4000 corporate universities in the United States and 3700 in China (Lui Abel and Li 2012). More recently, some corporate universities have become accredited, offer degrees, and opt to outsource corporate education to traditional universities (Andresen and Lichtenberger 2007; Thompson 2000).² Since traditional universities are also interested in partnering with corporation because of the potential economic gains, Narasimharao (2010) asserts there are advantages to integrating corporate education into traditional universities. This approach is assumed to narrow the boundaries between corporate and traditional universities and, thus, make traditional universities resemble businesses. Given the prosperity of corporate universities, some authors argue that they may pose the greatest threat to traditional universities (Ball and Butler 2000; Baporikar 2014; Nixon and Helms 2002; Thompson 2000). Others propose that corporate universities might provide better undergraduate-level education than traditional

universities (Blass 2005). To this end, this research tries to answer the following research question: can integrating corporation education into traditional universities provide better educational outcomes?

To explore the above research question, the performance of Japanese firms led by CEOs who graduated from traditional universities is compared with those led by CEO who graduated from corporate universities. The Japanese setting is useful to examine our idea because the corporate universities in Japan are more comparable to traditional universities than their counterparts in other countries. For example, in the United States and European countries, the main target of corporate universities are the employees, most of whom have already completed their undergraduate education in traditional universities before they join companies, which makes it difficult to disentangle the effects of corporate universities from those of traditional universities. However, in Japan, both traditional and corporate universities provide undergraduate education.³

Our empirical results show that the firms led by CEOs whose last educational degree is a graduate from a corporate university significantly underperform their peers who graduated from traditional universities, which suggests that integrating corporation needs into traditional higher education will lead to lower individual productivity. One potential reason is that market-oriented education may prohibit creative and critical thinking abilities because subjects that do not fit well with the for-profit purpose (e.g., arts, humanities, critical social science) may be neglected (Elton 2000; Rutherford 2005; Anwaruddin 2013). The primary results hold for a battery of supplemental tests, as to mitigate endogeneity problems and alternative scenarios.

The contributions of this article to the literature are as follows. First, it investigates the heterogeneous educational effects of CEOs. While the literature provides evidence on the effects of CEO education on firm performance, no studies consider the degree to which a university integrates corporation needs (King et al. 2016; Chevalier and Ellison 1999; Beber and Fabbri 2012; Bertrand and Schoar 2003). Some studies find that the CEOs who hold an MBA degree are more likely to pursue risky strategies and outperform their peers. In a similar vein, CEOs with stronger educational credentials (Ivy League schools) are more welcomed by the market (Elsaid et al. 2015; Miller et al. 2015; Gottesman and Morey 2010). This research offers a new insight: the type of university matters. Second, this paper extends the debate over what should universities be (Rutherford 2005; Lynch 2006; Thompson 2000; Blass 2001) by comparing CEOs who graduated from traditional universities with those who graduated from corporate universities. While some papers compare traditional universities with corporate universities (Nixon and Helms 2002; Blass 2001), there is little empirical evidence. This research takes advantage of the Japanese data and highlights that the CEOs who graduated from corporate universities show inferior firm performance. Finally, our research also contributes to the strand of literature examining the determinants of firm performance (Khuong et al. 2020).

The rest of this paper is organized as follows. Section 2 reviews the related literature. Section 3 presents the background of Japanese corporate universities. Section 4 describes our sample and methodology. Section 5 show our main empirical results and Section 6 offers a summary and the conclusions of this study.

2. Literature Review

Nearly 170 years ago, in his book *The Idea of a University*, Newman (2008) stated that a university is a place of teaching universal knowledge. Over the centuries, universities have served as guardians and creators of knowledge, as well as watchdogs of free exchange of ideas. However, there is an increasing tendency, both in developed and emerging countries, to adopt market-based reforms by privatizing universities (Gebreiter 2021; Kallio et al. 2016; Parker 2011, 2012), which translates into for-profit higher education and a market-oriented curriculum (Rutherford 2005).

At the end of this spectrum of market-oriented higher education is the emergence of corporate universities. Different from training departments that provide orientation and on-

the-job related skill training, a corporate university can be defined as an educational institution that can be used as a strategic tool designed to pursue long-term goals, as well as provide sustainable competitive advantage to parent companies (Andresen and Lichtenberger 2007).⁴ As opposed to a traditional university, where general-purpose education is provided, corporate universities are thought to have a hybrid nature, in that they provide both specific and general training.⁵ As an increasing number of corporate universities have become accredited and offer degrees, some authors argue that it is advantageous to integrate corporate education into traditional universities and that corporate universities may pose the greatest threat to traditional universities (Ball and Butler 2000; Baporikar 2014; Nixon and Helms 2002; Thompson 2000).

With respect to the educational outcomes of corporate universities, two competing hypotheses can be proposed. On the one hand, corporate universities can provide better educational outcomes than traditional universities because integrating corporate needs into higher education can close the gap between workforce demand and the educational supply of traditional universities. On the other hand, Elton (2000) contends that this increasing commercialization will lead to the unintended consequences, in that students go to university solely to gain career skills and credentials. Additionally, market-oriented education may prohibit creative and critical thinking abilities because subjects that do not fit well with the for-profit purpose (e.g., arts, humanities, critical social science) may be neglected (Rutherford 2005; Anwaruddin 2013). Consequently, the second idea asserts that a corporate university is associated with lower educational outcome. From the above argument, this paper proposes the following two competing hypotheses:

H1a. *CEOs whose last educational degree is a graduate from a corporate university significantly outperform their peers who graduated from traditional universities.*

H1b. *CEOs whose last educational degree is a graduate from a corporate university significantly underperform their peers who graduated from traditional universities.*

3. Background of Japanese Corporate Universities

As one of the best-known corporate universities in Japan, the Toyota Technological Institute (TTI) was founded in 1981 by the Toyota Motor Corporation. According to its history and mission, TTI was opened in 1981 and began offering a unique educational program based on its founding philosophy and aimed to maintain technological competitiveness.⁶ Initially, TTI only accepted students with industrial work experience. However, over 80% of the students admitted since 1993 have been new high-school graduates. More recently, TTI further opened its PhD program and established a sister institution, TTI Chicago, in 2003. Toyota Motor Corporation has been involved in TTI by appointing the chairman of the board of trustees, who is usually either the executive or ceremonial head of the university.⁷

Similarly, Seikei University was established by Koyata Iwasaki, the fourth head of the Mitsubishi zaibatsu.⁸ It used to be managed by Mitsubishi zaibatsu before World War II and, even after the dissolution of Mitsubishi zaibatsu, it has remained close to the Mitsubishi Group. The current chairman of the board of trustees is Ken Kobayashi, who is also currently serves as the chairman of Mitsubishi Corporation.⁹

Given the fact that most corporate universities were founded by corporations and the founding corporations can exert power over them through the appointment of the chairman, we assume that corporate universities are implicitly or explicitly used as a strategic tool to pursue the long-term goals, as well as the sustainable competitive advantages of founding companies. Indeed, Shigenobu Nagamori, the founder (CEO) of Nidec corporation, indicated that the Kyoto University of Advanced Science was created in 1969, aiming to develop human resources.¹⁰

As previously argued, the unique setting of Japanese universities enables us to compare the educational effects of corporate and traditional universities. Any Japanese high

school student can either choose a corporate university or a traditional one, depending on his/her score of the National Centre Test for University Admissions, geographical considerations, as well as personal preferences. By contrast, the main target of corporate universities in the United States and European countries is the employee.

4. Sample Selection, Data, and Methodology

This research selected corporate universities in Japan from two websites,¹¹ namely the university name, the founding company, as well as its history. In total, we identified 14 corporate universities. Then, the authors double checked the list of corporate universities by referring to the homepages of these universities, as well as Japan Student Services Organization (JASSO). Information (e.g., last educational background, major in university, birthplace) for CEOs was taken from the Toyokeizai Director database. Then, the authors merged the list of corporate universities with the Toyokeizai Director database using the names of corporate universities. The financial information is available from Nikkei NEEDS Financial Quest. Table 1 reports the presence of Japanese corporate universities. Column 1 indicates that the number of companies led by CEO who are graduates from universities founded by corporations is approximately 30 every year and accounts for 1.2% of all firm-year observations.

Table 1. Sample distribution.

Year	Special CEOs	Others
2001	25	1759
2002	27	1779
2003	29	1807
2004	29	1829
2005	27	1905
2006	29	1968
2007	29	2021
2008	29	2050
2009	27	2057
2010	21	2073
2011	20	2090
2012	21	2113
2013	20	2158
2014	22	2189
2015	22	2257
2016	22	2318
2017	26	2369
2018	24	2418
2019	24	2457
Total	473	40,090

Table A2 (in the Appendix A) further shows the ranking for CEO producing universities in Japan.¹² An important feature of the CEO labour market in Japan is that the top 10 universities (e.g., Keio University, Waseda University, University of Tokyo), all of which are traditional universities, account for around 40% of all observations in our dataset. Meanwhile, the authors found that three corporate universities stand out: 293 firm-year observations are from Seikei University, 59 from Asia University, and 50 from Musashi University.

Furthermore, as shown in Table A3 (in the Appendix A), approximately 70% of the CEOs who graduated from universities founded by corporations majored in economics, law, or engineering. With respect to whether the appointment of a CEO from a corporate university is related to geographical characteristics. Table A4 (in the Appendix A) presents the prefecture distribution of the headquarters of Japanese firms, and a similar pattern was

observed in that most of the Japanese companies are headquartered in Tokyo and Osaka regardless of their CEOs' educational backgrounds.¹³

To test the hypotheses, the authors first employed a linear regression of firm performance to directly compare the educational impacts between corporate and traditional universities as a benchmark. As our key independent variable, Special CEOs is a dummy variable equal to one for firms with CEOs coming from universities founded by corporations, and zero otherwise. ROA (operating income scaled by total assets), SGR (sales growth ratio), and Tobin's Q (total capitalization and book value of liabilities scaled by book value of assets) are used to measure firm performance.

As control variables, the authors include CEO age, CEO ties (natural logarithm of the total number of CEOs from the same university in a given year), foreign institutional investor (foreign institutional investors' total ownership), proportion of outside director, Ln (total assets), and leverage (total debts scaled by total assets). One-year lagged data are used for these control variables. All variables are winsorized at the top and bottom 1% levels (except for the dummy variables).

To alleviate the endogeneity issue, we employ the following methodological approaches: an instrumental variables (IV) estimation strategy and propensity score matching (PSM). A battery of robustness checks has been further conducted to rule out some potential alternative scenarios.

Table 2 presents the summary statistics of the variables separately for the subsample (Special CEOs versus Others). This research finds that Special CEOs significantly underperform their peers who graduated from traditional universities in terms of accounting-based, as well as market-base performance measures. ROA is 2.52% for Special CEOs, which is lower than for other CEOs (3.79%). Similarly, firms led by special CEOs tend to have a lower Tobin's Q (0.94 versus 0.98, $p < 0.01$). These results are consistent with the second hypothesis that the educational effect of corporate universities is inferior to that of traditional universities. As argued by Elton (2000), increasing commercialization will lead to the unintended consequences, in that students go to university solely to gain career skills and credentials. Additionally, market-oriented education may prohibit creative and critical thinking abilities (Rutherford 2005; Anwaruddin 2013).

Table 2. Summary statistics.

	Special CEOs	Others	<i>p</i> -Value
ROA	2.52% [2.56%] N = 473	3.79% [3.75%] N = 39,511	0.000 *** [0.000 ***]
SGR	2.19% [1.15%] N = 464	4.19% [2.77%] N = 38,753	0.007 *** [0.000 ***]
Tobin's Q	1.14 [0.94] N = 473	1.17 [0.98] N = 39,617	0.518 [0.001 ***]
CEO Age	59 [60] N = 473	60 [61] N = 39,617	0.66 [0.080 *]
CEO Ties	2.24 [2.83] N = 473	3.59 [3.71] N = 39,617	0.000 *** [0.000 ***]
Foreign institutional investor	5.40% [1.60%] N = 469	9.36% [4.74%] N = 37,739	0.000 *** [0.000 ***]
Proportion of outside director	10.99% [0.00%] N = 473	13.82% [11.11%] N = 39,617	0.000 *** [0.000 ***]
Ln(Total assets)	10.36 [10.33] N = 473	10.72 [10.52] N = 39,617	0.000 *** [0.004 ***]
Leverage	22.63% [21.00%] N = 473	22.52% [19.62%] N = 39,617	0.890 0.514

Notes: this table presents descriptive statistics. See Appendix A Table A1 for the variable definitions. *p*-values are for the mean [median] difference test. Significance at the 10%, and 1% levels is indicated by *, and ***, respectively.

This research also considered various control variables that potentially affect firm performances. Table 2 shows that Special CEOs have significantly lower foreign institutional

ownership and a lower proportion of outside directors than other CEOs. Additionally, CEO ties has a significant smaller value for Special CEOs than for other CEOs. Meanwhile, the authors do not find a significant difference in CEO age and Leverage.

5. Empirical Results

5.1. Baseline: Ordinary Least Squares Estimation

This section presents the results of ordinary least squares (OLS) regressions, where the dependent variables are ROA, SGR, and Tobin's Q. Industry and year-fixed effects are included in all estimations to account for industry characteristics and macro-economic conditions. Models (1) and (2) in Table 3 provide negative and significant coefficients on Special CEOs, implying that, all else being equal, Special CEOs underperform their peers in terms of ROA (SGR) by 1% (1.8%). However, Model (3) shows an insignificant sign for Special CEOs and, thus, this research does not find a difference in Tobin's Q. With respect to the control variables, Table 3 implies that higher foreign institutional ownership and the proportion of outside directors are associated with better firm performance. CEO Ties has a significant coefficient on Tobin's Q, highlighting the value of connections (social capital).

Table 3. OLS regressions.

Dependent Variables	ROA	SGR	Tobin's Q
	(1)	(3)	(4)
Special CEOs	−0.010 *** (−3.38)	−0.018 ** (−2.56)	0.046 (1.37)
Control variables:			
CEO Age	−0.000 (−0.55)	−0.002 *** (−13.35)	−0.011 *** (−20.48)
CEO Ties	−0.000 (−0.97)	−0.000 (−0.27)	0.011 *** (6.39)
Foreign institutional investor	0.085 *** (17.87)	0.116 *** (10.10)	1.800 *** (32.46)
Proportion of outside director	−0.032 *** (−9.78)	0.003 (0.37)	0.308 *** (8.85)
Ln (Total assets)	−0.000 (−0.61)	−0.003 *** (−4.14)	−0.106 *** (−29.06)
Leverage	−0.113 *** (−44.37)	−0.033 *** (−5.36)	0.016 (0.72)
Constant	0.063 *** (9.08)	0.195 *** (13.02)	2.816 *** (42.67)
N	38,127	37,384	38,208
R ²	0.152	0.106	0.239
Industry dummy	Y	Y	Y
Year dummy	Y	Y	Y

Notes: see Appendix A Table A1 for the variable definitions. Heteroskedasticity-consistent standard errors are used to compute Z-statistics. Significance at the 5% and 1% levels is indicated by **, and ***, respectively.

5.2. Robustness Checks

One can criticize our results, showing that Special CEOs' firms differ from others in their various characteristics. If endogeneity is a concern, our main results may reflect correlation rather than causation. To mitigate this endogeneity concern, the authors use two additional approaches to establish the causal inference between Special CEOs and firm performance.

5.2.1. Instrumental Variable Regression

Firstly, as in Nam and Uchida (2019), the authors implement general method of moments (GMM) IV regressions with industry- and year-fixed effects of firm performance to deal with endogeneity concerns. Since the Pagan–Hall test is always significant, GMM IV is used instead of simple two-stage least squares regression. To identify the impact of Special CEOs on firm performance, we need a variable that reflects the probability of choosing a corporate university that does not directly affect firm performance. While it is extremely difficult to find appropriate IVs, the authors employ the following two

instrumental variables: (1) Tokyo, a dummy variable equalling one for firms with a CEO who was born in Tokyo, and zero otherwise, and (2) Female, a dummy variable equalling one for firms with a female CEO, and zero otherwise. Our rationale is as follows. First, unreported results show that around 60% of the corporate universities are located in Tokyo. This implies that, *ceteris paribus*, a high school graduate born in Tokyo is more likely to choose a corporate university due to its geographical proximity. Meanwhile, the birthplace of CEOs is more likely to be exogenously determined and, thus, is less likely to directly affect firm performance. Second, after verifying our director database, the authors found that none of the directors who are graduates of corporate universities are female. This result is not surprising given the high levels of gender inequality in Japan. In the Global Gender Gap Report 2020, Japan ranked 121 out of 153 countries according to gender equality. Traditionally, a women's role has been considered to prepare them to be better wives and mothers, which shaped the persistent view that educating daughters is less important than educating sons (Fujimura-Fanselow 1985). Therefore, the authors expect that a female high-school student is less likely to go to Tokyo and choose a corporate university. Unreported regression results also suggest that none of the performance measures are related to the female dummy.

The first-stage results in Table 4 confirm these assumptions. Tokyo (Female) carries a significant positive (negative) coefficient of 0.014 (−0.014), suggesting the validity of the IV. Moreover, the partial F-statistic is 88.75 and the Stock–Yogo weak ID test critical value at 10% IV size is 19.93, thus rejecting the null hypothesis of a weak instrumental variable. Additionally, the Hansen J test statistic is not statistically significant at the 5% level, which indicates that the IVs are valid in all three estimations.

Table 4. Instrumental variable regression (GMM).

	1st Stage	2nd Stage		
		ROA	SGR	Tobin's Q
		(1)	(2)	(3)
Special CEOs		−0.123 ** (−2.09)	−0.488 *** (−2.98)	−0.629 (−0.99)
CEO AGE	0.000 (0.35)	−0.000 (−0.52)	−0.002 *** (−12.99)	−0.011 *** (−20.47)
CEO Ties	−0.004 *** (−16.91)	−0.001 ** (−2.12)	−0.002 ** (−2.51)	0.009 *** (3.03)
Foreign institutional investor	−0.027 *** (−3.79)	0.082 *** (16.33)	0.103 *** (8.05)	1.781 *** (30.78)
Proportion of outside director	−0.001 (−0.23)	−0.032 *** (−9.73)	0.002 (0.27)	0.307 *** (8.81)
Ln(Total assets)	−0.000 (−0.86)	−0.000 (−0.69)	−0.003 *** (−4.16)	−0.106 *** (−28.95)
Leverage	−0.008 ** (−1.98)	−0.114 *** (−43.56)	−0.036 *** (−5.56)	0.012 (0.53)
Constant	0.015 ** (2.29)	0.065 *** (9.18)	0.203 *** (12.95)	2.828 *** (42.08)
Tokyo	0.014 *** (7.02)			
Female	−0.014 *** (−11.48)			
Industry dummy	Y	Y	Y	Y
Year dummy	Y	Y	Y	Y
Partial R ²	0.002			
F-test of excluded instruments	88.75 ***			
Hansen J test of overidentification (p-value)		0.001 (0.978)	3.430 * (0.064)	0.252 (0.616)
N	38,127	38,127	37,384	38,208
Centered R ²	0.012	0.118	0.003	0.230

Notes: see Appendix A Table A1 for the variable definitions. Heteroskedasticity-consistent standard errors are used to compute Z-statistics. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

The second-stage regression uses the fitted value of Special CEOs obtained in the first-stage regression, and the results are qualitatively similar to those in our baseline

regressions. The coefficients in Models (1) and (2) in Table 4 are -0.123 and -0.488 for ROA and SGR, respectively, thus highlighting the significantly negative impact of corporate universities on CEO productivity. While Model (3) also carries a negative sign for Special CEOs in the regressions of Tobin's Q, it is not statistically significant.

5.2.2. Propensity Score Matching

Comparing the performance of firms led by special CEOs to that of companies led by other CEOs with similar characteristics is another effective way to mitigate the endogeneity concern. Following Fan and Uchida (2019), the authors first run a logit regression, where the dependent variable is Special CEOs, and all variables (including industry and year dummies) in Table 3 are included to estimate the probability of appointing a special CEO. For every Special CEOs, we selected the three (five) firms with the nearest propensity of being a Special CEOs as the matched subsample. The results are reported in Panel A of Table 5. Given the difference between Special CEOs and its matched firms narrows for this matched subsample, this research still finds a similar pattern in that Special CEOs significantly underperform their counterparts. ROA is 2.55% for Special CEOs, whereas it is 3.47% for their matched peers (difference: -0.92% , $p < 0.05$).

Table 5. Propensity score matching estimates.

Panel A: Full Sample	1 vs. 3	1 vs. 5
ROA		
Special CEOs	2.55%	2.55%
Others	3.47%	3.65%
Difference	-0.92% **	-1.09% ***
	(-2.49)	(-3.12)
SGR		
Special CEOs	2.14%	2.14%
Others	4.65%	4.65%
Difference	-2.50% ***	-2.51% ***
	(-2.99)	(-3.13)
Tobin's Q		
Special CEOs	1.15	1.15
Others	1.09	1.09
Difference	0.05	0.06
	(1.27)	(1.41)
Panel B: Post-turnover Period	1 vs. 3	1 vs. 5
Ave ROA (1,3)		
Special CEOs	2.33%	2.33%
Others	4.24%	3.88%
Difference	-1.92% *	-1.35%
	(-1.75)	(-1.22)
Ave SGR (1,3)		
Special CEOs	0.98%	0.98%
Others	5.56%	4.83%
Difference	-4.57% **	-3.85% **
	(-2.42)	(-2.17)
Ave Tobin's Q (1,3)		
Special CEOs	1.02	1.02
Others	1.03	1.06
Difference	-0.01	-0.04
	(-1.03)	(-0.72)

Notes: this table reports the mean values of the firm performance measures of Special CEOs and the matching non-Special CEOs. See Appendix A Table A1 for the variable definitions. T-statistics are for the mean difference test. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

While the main results remain unchanged, the authors further conducted an event study. Specifically, this research first identified CEOs turnover year (event = 0). To be included, the authors require that the incoming CEOs need to stay for at least three years

and that all information should be available for one year prior to the turnover (event = -1). In total, the authors successfully identified 21 CEO turnovers for Special CEOs and 1614 turnovers for CEOs graduating from traditional universities. Then, the authors selected three (five) firms with the nearest propensity of being a Special CEO as the matched subsample based on information prior to the CEO turnover (event = -1). The results for the post-turnover period are shown in Panel B of Table 5. For instance, the three-year average ROA is 2.33% for newly appointed Special CEOs and 4.24% for the matched peers.

5.3. Additional Analyses

One can argue that our main results may be driven by the fact that none of the Japanese corporate universities rank in the top 10 of the CEO producing universities in Japan. Given that a top 10 university in Japan is equivalent to an Ivy League school in the United States, it is possible that the CEOs with stronger educational credentials are more likely to demonstrate superior long-term performance (Elsaid et al. 2015; Miller et al. 2015; Gottesman and Morey 2010). To address this concern, the authors first reran all our analyses while excluding the top 10 (top 20) universities, and the results for the GMM IV are reported in Table 6. Surprisingly, the results are even stronger for this subsample, and it finds that Special CEOs significantly underperform for all three measures. The estimated coefficient in Model (3) indicates that Tobin's Q is 1.208 lower for Special CEOs than for other CEOs.

Table 6. Instrumental variable regression (GMM) (sub-samples).

Panel A: Excluding top 10 universities			
Dependent Variables	ROA (1)	SGR (2)	Tobin's Q (3)
Special CEOs	-0.057 * (-1.66)	-0.198 ** (-2.22)	-1.208 *** (-3.17)
Control variables:	Yes	Yes	Yes
Industry dummy	Yes	Yes	Yes
Year dummy	Yes	Yes	Yes
N	25,266	24,674	25,307
R ²	0.139	0.081	0.213
Panel B: Excluding top 20 universities			
	ROA (1)	ROE (2)	SGR (3)
Special CEOs	-0.126 *** (-3.34)	-0.281 *** (-2.91)	-1.261 *** (-3.16)
Control variables	Y	Y	Y
Industry dummy	Y	Y	Y
Year dummy	Y	Y	Y
N	24,785	24,185	24,826
R ²	0.096	0.057	0.197

Notes: see Appendix A Table A1 for the variable definitions. Heteroskedasticity-consistent standard errors are used to compute Z-statistics. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

To further differentiate the educational effects from CEO ability, the authors reran all our analyses by adding more control variables related to CEOs' inherent abilities. Following Custódio and Metzger (2014), the following four variables are added to capture CEOs' innate talents, as well as experience: (1) Fast Track: the age of the first CEO job; (2) Dual Directorship: a dummy variable equal to one for a CEO who also takes the director position of other firm, and zero otherwise; (3) Experience: a dummy variable equal to one for CEO who worked for other company before joining the current company, and zero otherwise; and (4) Sd Score: indicates how far from the statistical mean a typical student admitted to a university scores on university entrance examination. The authors expect that the younger an individual became CEO for the first time, the more talented he/she is. Similarly, high quality board members are more likely to serve on multiple boards (Brickley et al. 1999;

Bugeja et al. 2009; Coles and Hoi 2003; Gilson 1989, 1990). Experience is also expected to positively affect firm performance (Crossland et al. 2014). One might argue that corporate universities are different from traditional top-ranking universities in terms of education credentials. To mitigate this concern, this research further adds Sd Score and assume a higher Sd Score is associated with higher education credentials, as well as intellectual ability.¹⁴ However, it is also worth noting that our sample is substantially reduced due to missing data.

The results are presented in Table 7. With respect to the control variables, the estimated results are consistent with our conjecture and all four variables significantly affect firm performance, indicating that the additional variables successfully capture CEOs' inherent abilities and experience. More importantly, qualitatively similar results are obtained even after controlling for more CEO-specific characteristics.

Table 7. Controlling for more CEO characteristics.

Panel A: OLS			
Dependent variables:	ROA (1)	SGR (3)	Tobin's Q (4)
Special CEOs	−0.009 *** (−2.91)	−0.017 ** (−2.38)	0.047 (1.41)
Fast Track	−0.001 *** (−10.96)	−0.001 *** (−9.83)	−0.005 *** (−9.51)
Dual Directorship	−0.002 (−0.61)	0.013 * (1.78)	0.175 *** (4.70)
Experience	0.001 (1.43)	0.018 *** (7.99)	0.084 *** (9.07)
Sd Score	−0.010 (−1.47)	−0.024 (−1.45)	0.386 *** (5.43)
Other control variables:	Y	Y	Y
N	26,238	25,896	26,305
R ²	0.171	0.121	0.235
Panel B: IV GMM			
Dependent variables:	ROA (1)	SGR (3)	Tobin's Q (4)
Special CEOs	−0.086 * (−1.95)	−0.307 ** (−2.57)	−0.035 (−0.07)
Other control variables:	Y	Y	Y
N	26,238	25,896	26,305
R ²	0.146	0.060	0.236
Panel C: PSM			
ROA			
	1 vs. 3		1 vs. 5
Special CEOs	2.64%		2.64%
Others	3.79%		3.72%
Difference	−1.16% *** (−3.17)		−1.08% *** (−3.08)
SGR			
Special CEOs	2.10%		2.10%
Others	4.10%		3.88%
Difference	−2.01% ** (−2.37)		−1.78% ** (−2.22)
Tobin's Q			
Special CEOs	1.15		1.15
Others	1.07		1.08
Difference	0.07 * (−1.75)		0.07 (1.64)
Number of treated	465		
Number of untreated	24,851		

Notes: see Appendix A Table A1 for the variable definitions. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively.

6. Conclusions

It is well established that the education background of a CEO significantly affects firm performance (Hambrick and Mason 1984; King et al. 2016; Chevalier and Ellison 1999; Beber and Fabbri 2012) because education shapes the cognitive abilities of the CEO, which in turn influences firm investment and general decision-making. Furthermore, the effects of education are likely to vary according to the type and quality of education. Beber and Fabbri (2012) found that CEOs with MBA backgrounds tend to aggressively engage in forex markets. Chevalier and Ellison (1999) show that the CEOs graduating from university (undergraduate) with high SAT scores substantially outperforms their peers. Miller et al. (2015) further argue that firms run by CEO having graduated from Ivy League schools show superior performance, especially for undergraduates program. This research adds to this literature stream by investigating whether the effects of CEO education on firm performance differ by university type. Comparing corporate universities with traditional universities also extends the debate over what universities should be (Blass 2001; Lynch 2006; Rutherford 2005; Thompson 2000).

This research developed two competing predictions regarding the educational outcomes of corporate universities. On the one hand, corporate universities can provide better educational outcomes than traditional universities because integrating corporate needs into higher education can close the gap between workforce demand and the educational supply of traditional universities (Ball and Butler 2000; Baporikar 2014). On the other hand, market-oriented education may prohibit creative and critical thinking abilities (Rutherford 2005; Anwaruddin 2013).

The empirical findings can be summarized as follows. First, the OLS regression reveals that CEOs that have graduated from corporate universities significantly underperform their counterparts graduating from traditional universities. Second, to mitigate the endogeneity concern, the authors use two additional approaches to establish the causal inference between Special CEOs and firm performance: GMM IV regressions with industry- and year-fixed effects, and propensity score matching. Finally, to further differentiate the educational effects from CEO ability, the authors reran all the analyses by adding more control variables related to CEOs' inherent abilities. Overall, qualitatively similar results are obtained even after controlling for more CEO-specific characteristics.

The results indicate that the integration of corporation education into traditional universities is associated with relatively lower productivity, at least at the CEO level. While an increasing number of corporate universities have become accredited and offer degrees, (Ball and Butler 2000; Baporikar 2014; Nixon and Helms 2002; Thompson 2000), the findings indicate that integrating corporation education into traditional universities cannot provide better educational outcomes.

However, this research is limited by a lack of adequate controls over characteristics of universities (e.g., courses, modules, mission, and vision). Future research should consider whether our findings can be generalized to other institutional settings. Finally, there are many other factors that might affect our main results including main bank relationship, family businesses and political connections.

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Appendix A

Table A1. Definitions of variables.

Special CEOs	A dummy variable equaling one for firms with a CEO coming from universities founded by corporations and zero otherwise
CEO AGE	The age of CEOs
CEO Ties	Natural logarithm of total number of CEOs from the same university for a given year
Foreign Institutional investor	Foreign Institutional investors' total ownership
Proportion of outside director	The number of outside directors divided by board size
Ln (Total assets)	Natural logarithm of total assets
Leverage	Leverage is total debts scaled by total assets
ROA	Operating income divided by total assets
SGR	Sales growth ratio
Tobin' Q	Total capitalization and book value of liabilities scaled by book value of assets
Tokyo	A dummy variable equaling one for firms with a CEO who was born in Tokyo and zero otherwise
Female	A dummy variable equaling one for firms with a female CEO and zero otherwise
Fast Track	The age of the first CEO job
Dual Directorship	A dummy variable equaling one for CEO who also takes the director position of other firms and zero otherwise
Experience	A dummy variable equaling one for CEO who worked for other company before joining the current company and zero otherwise
Sd Score	Sd Score indicates how far from the statistical mean a typical student admitted to a university score on university entrance examination
Ave ROA (1,3)	Three-year average of ROA during post-turnover period, where 0 indicates turnover year
Ave SGR (1,3)	Three-year average of SGR during post-turnover period, where 0 indicates turnover year
Ave Tobin' Q (1,3)	Three-year average of Tobin' Q during post-turnover period, where 0 indicates turnover year

Table A2. The ranking for CEO producing universities in Japan.

Name	Freq.	Cum.
Keio University	3652	11.1%
Waseda University	2199	6.7%
University of Tokyo	2184	6.6%
Nihon University	1050	3.2%
Kyoto University	974	3.0%
Chuo University	865	2.6%
Meiji University	732	2.2%
Doshisha University	700	2.1%
Hitotsubashi University	530	1.6%
Osaka University	504	1.5%

Table A3. Major of CEOs who graduated from universities founded by corporations.

Major	Freq.
Economics	215
Law	85
Engineering	62
Political Science and Economics	48
Commerce	28
Electrical Engineering	10
Pharmacy	9
Chemistry	6
Business	5
Humanities	5

Table A4. Prefecture Distribution of headquarters.

Prefecture	CEOs from Universities Founded by Corporations	Others
Tokyo	208	15,565
Osaka	40	4253
Aichi	17	2078
Chiba	14	456
Hiroshima	14	506
Kanagawa	13	1611
Shizuoka	13	490
Okayama	10	187
Ibaraki	7	87
Saitama	6	711
Niigata	6	369
Gunma	6	202
Kochi	5	42
Kagawa	3	159
Kyoto	1	651

Table A5. Birthplace Distribution.

Prefecture	CEOs from Universities Founded by Corporations	Others
Tokyo	148	6201
Hiroshima	26	924
Kanagawa	26	1594
Aichi	25	1738
Chiba	23	522
Ibaraki	21	307
Hyogo	20	1886
Nara	17	225
Shizuoka	14	841
Nagasaki	10	301
Kyoto	9	905
Kagoshima	9	380
Ehime	8	354
Niigata	8	550
Tochigi	7	323
Saitama	6	597
Miyazaki	6	175
Yamaguchi	6	506
Hokkaido	5	1038
Oita	5	295
Okayama	5	477
Kochi	5	114
Miyagi	3	389
Iwate	3	118
Ishikawa	3	372
Kumamoto	2	257
Osaka	1	2695
Fukuoka	1	1207
Gunma	1	311

Notes

- 1 The first corporate university in the United States, Disney University, was founded in 1955.
- 2 General Motors Institute, set up by General Motors, was merged with Kettering University and received accreditation from the North Central Association of Colleges and Schools' Higher Learning Commission.
- 3 Educational system in Japan is similar to that in western countries. Japan has three types of universities: national, local public, and private universities, all of which must register with the Ministry of Education. All the corporate universities in Japan are private universities. Details about Japanese corporate universities will be provided in Section 3.
- 4 Specifically, on-the-job training falls into the category of specific training, which is specific to a firm's production, and is less useful to other companies (Becker 1962). By contrast, general training shapes the skills which are transferable and useful to many employers.
- 5 Firms have a strong incentives to provide both training types because: (1) firm-sponsored general training can increase productivity gains (Barron et al. 1989) and (2) the value of specific skills increases with the amount of general skills (Acemoglu and Pischke 1999; Groen 2006).
- 6 The history and mission of TTI can be found here: <https://www.toyota-ti.ac.jp/english/about/index.html> (accessed on 1 January 2022).
- 7 The first two chairmen of the board of trustees are family members of Toyota Group. The current chairman, Masuda Yoshihiko, was appointed in 2017 at the age of 64. He used to be the representative director of Toyota Central R&D Labs.
- 8 Zaibatsu is a Japanese term referring to industrial and financial vertically integrated business conglomerates in the Empire of Japan. It was dissolved after World War II.
- 9 Other famous corporate universities include Musashi University, sponsored by Tobu Railway; Asia University, set up by Tokyo Railways; and Ryutsu Keizai University, established by Nippon Express.
- 10 <https://diamond.jp/articles/-/216645?page=2> (accessed on 1 January 2022).
- 11 <https://diamond.jp/articles/-/216645> and <http://studyup.s1001.xrea.com/archives/post-259.html> (accessed on 1 January 2022).
- 12 The total number of Japanese universities (including corporate universities) in 2021 was 788.
- 13 Table A5 (Appendix A) reports the birthplace distribution of CEOs and shows that approximately one third of CEOs were born in Tokyo.
- 14 The information for Sd Score is taken from the following website: <https://manabi.benesse.ne.jp/ap/daigaku/search/nanido/> (accessed on 1 January 2022).

References

- Acemoglu, Daron, and Jörn Steffen Pischke. 1999. The structure of wages and investment in general training. *Journal of Political Economy* 107: 539–72. [CrossRef]
- Andresen, Maike, and Bianka Lichtenberger. 2007. The corporate university landscape in Germany. *Journal of Workplace Learning* 19: 109–23. [CrossRef]
- Anwaruddin, Sardar M. 2013. Neoliberal universities and the education of arts, humanities and social sciences in Bangladesh. *Policy Futures in Education* 11: 364–74. [CrossRef]
- Ball, Derrick F., and Jeffrey Butler. 2000. Research assessment exercises in United Kingdom universities-learning to innovate. *International Journal of Services Technology and Management* 1: 341–57. [CrossRef]
- Baporikar, Neeta. 2014. Corporate university edification in knowledge society. *International Journal of Strategic Change Management* 5: 125–39. [CrossRef]
- Barron, John M., Dan A. Black, and Mark A. Loewenstein. 1989. Job matching and on-the-job training. *Journal of Labor Economics* 7: 1–19. [CrossRef]
- Beber, Alessandro, and Daniela Fabbri. 2012. Who times the foreign exchange market? Corporate speculation and CEO characteristics. *Journal of Corporate Finance* 18: 1065–87. [CrossRef]
- Becker, Gary S. 1962. Investment in human capital: A theoretical analysis. *Journal of Political Economy* 70: 9–49. [CrossRef]
- Bernile, Gennaro, Vineet Bhagwat, and P. Raghavendra Rau. 2017. What doesn't kill you will only make you more risk-loving: Early-life disasters and CEO behavior. *Journal of Finance* 72: 167–206. [CrossRef]
- Bertrand, Marianne, and Antoinette Schoar. 2003. Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics* 118: 1169–208. [CrossRef]
- Blass, Eddie. 2001. What's in a name? A comparative study of the traditional public university and the corporate university. *Human Resource Development International* 4: 153–72. [CrossRef]
- Blass, Eddie. 2005. The rise and rise of the corporate university. *Journal of European Industrial Training* 29: 58–74. [CrossRef]
- Brickley, James A., James S. Linck, and Jeffrey L. Coles. 1999. What happens to CEOs after they retire? New evidence on career concerns, horizon problems, and CEO incentives. *Journal of Financial Economics* 52: 341–77. [CrossRef]
- Bugeja, Martin, Raymond Da Silva Rosa, and Andrew Lee. 2009. The impact of director reputation and performance on the turnover and board seats of target firm directors. *Journal of Business Finance & Accounting* 36: 185–209.
- Cappiello, Giuseppe, and Giulio Pedrini. 2017. The performance evaluation of corporate universities. *Tertiary Education and Management* 23: 304–17. [CrossRef]

- Chevalier, Judith, and Glenn Ellison. 1999. Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance* 54: 875–99. [CrossRef]
- Coles, Jeffrey L., and Chun-Keung Hoi. 2003. New evidence on the market for directors: Board membership and Pennsylvania Senate Bill 1310. *Journal of Finance* 58: 197–230. [CrossRef]
- Crossland, Craig, Jinyong Zyung, Nathan J. Hiller, and Donald C. Hambrick. 2014. CEO career variety: Effects on firm-level strategic and social novelty. *Academy of Management Journal* 57: 652–74. [CrossRef]
- Custódio, Cláudia, and Daniel Metzger. 2014. Financial expert CEOs: CEO's work experience and firm's financial policies. *Journal of Financial Economics* 114: 125–54. [CrossRef]
- Elsaid, Eahab, Bradley W. Benson, and Dan L. Worrell. 2015. *Successor CEO Functional and Educational Background*. *Academy of Management Proceedings*. New York: Academy of Management Briarcliff Manor, p. 18514.
- Elton, Lewis. 2000. The UK research assessment exercise: Unintended consequences. *Higher Education Quarterly* 54: 274–83. [CrossRef]
- Fan, Pengda, and Konari Uchida. 2019. Credit crunch and timing of initial public offerings. *Pacific-Basin Finance Journal* 53: 22–39. [CrossRef]
- Fujimura-Fanselow, Kumiko. 1985. Women's participation in higher education in Japan. *Comparative Education Review* 29: 471–89. [CrossRef]
- Gebreiter, Florian. 2021. A profession in peril? University corporatization, performance measurement and the sustainability of accounting academia. *Critical Perspectives on Accounting* 87: 102292. [CrossRef]
- Gilson, Stuart C. 1989. Management turnover and financial distress. *Journal of Financial Economics* 25: 241–62. [CrossRef]
- Gilson, Stuart C. 1990. Bankruptcy, boards, banks, and blockholders: Evidence on changes in corporate ownership and control when firms default. *Journal of Financial Economics* 27: 355–87. [CrossRef]
- Gottesman, Aron A., and Matthew R. Morey. 2010. CEO educational background and firm financial performance. *Journal of Applied Finance (Formerly Financial Practice and Education)* 20. Available online: <https://ssrn.com/abstract=2693079> (accessed on 1 January 2022).
- Groen, Jeffrey A. 2006. Occupation-specific human capital and local labour markets. *Oxford Economic Papers* 58: 722–41. [CrossRef]
- Hambrick, Donald C., and Phyllis A. Mason. 1984. Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review* 9: 193–206. [CrossRef]
- Kallio, Kirsi-Mari, Kirsi-Mari Kallio, Janne Tienari, and Timo Hyvönen. 2016. Ethos at stake: Performance management and academic work in universities. *Human Relations* 69: 685–709. [CrossRef]
- Khuong, Nguyen Vinh, Nguyen Thanh Liem, Phung Anh Thu, and Thai Hong Thuy Khanh. 2020. Does corporate tax avoidance explain firm performance? Evidence from an emerging economy. *Cogent Business & Management* 7: 1780101.
- King, Timothy, Abhishek Srivastav, and Jonathan Williams. 2016. What's in an education? Implications of CEO education for bank performance. *Journal of Corporate Finance* 37: 287–308. [CrossRef]
- Lui Abel, Amy, and Jessica Li. 2012. Exploring the corporate university phenomenon: Development and implementation of a comprehensive survey. *Human Resource Development Quarterly* 23: 103–28. [CrossRef]
- Lynch, Kathleen. 2006. Neo-liberalism and marketisation: The implications for higher education. *European Educational Research Journal* 5: 1–17. [CrossRef]
- Mackey, Alison. 2008. The effect of CEOs on firm performance. *Strategic Management Journal* 29: 1357–67. [CrossRef]
- Miller, Danny, Xiaowei Xu, and Vikas Mehrotra. 2015. When is human capital a valuable resource? The performance effects of Ivy League selection among celebrated CEOs. *Strategic Management Journal* 36: 930–44. [CrossRef]
- Nam, Hocheol, and Konari Uchida. 2019. Accounts payable and firm value: International evidence. *Journal of Banking & Finance* 102: 116–37.
- Narasimharao, B. Pandu Ranga. 2010. Biotechnology education and societal demands: Challenges faced by biotechnology and human resources development. *Social Responsibility Journal* 6: 72–90. [CrossRef]
- Newman, John Henry. 2008. *The Idea of a University*. New Haven: Yale University Press.
- Nixon, Judy C., and Marilyn M. Helms. 2002. Corporate universities vs. higher education institutions. *Industrial and Commercial Training* 34: 144–50. [CrossRef]
- Parker, Lee. 2011. University corporatisation: Driving redefinition. *Critical Perspectives on Accounting* 22: 434–50. [CrossRef]
- Parker, Lee. 2012. From privatised to hybrid corporatised higher education: A global financial management discourse. *Financial Accountability & Management* 28: 247–68.
- Rutherford, Jonathan. 2005. Cultural studies in the corporate university. *Cultural Studies* 19: 297–317. [CrossRef]
- Thompson, Gordon. 2000. Unfulfilled prophecy: The evolution of corporate colleges. *The Journal of Higher Education* 71: 322–41. [CrossRef]