The effect of a CEO's education on firm performance and share performance after acquisitions

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Abstract

This paper explores the idea of CEO education as a characteristic that improves firm performance and increases firm value in acquisitions. The paper tests whether the buy-and-hold abnormal return is greater for CEOs with higher degrees of education, measured in three ways. Education was measured by obtained degree, obtained distinction and whether the CEO went to an Ivy League university. The data sample includes 257 S&P500 constituents from 2010 up til 2019 and includes 937 transactions. This paper used an OLS regression with abnormal returns from the aforementioned transactions as the dependent variable and education as the independent variable. This paper finds that graduating cum laude and having a doctorate is a good predictor for higher-than-average abnormal returns from acquisitions, whereas having an undergraduate degree is a good predictor for having lower-than-average abnormal returns from acquisitions. These findings were consistent for both short-term and long-term buy-and-hold abnormal returns.

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1 Introduction

Finding the right executives for your company is often time-consuming and expensive. Besides hiring CEOs for day-to-day operations, boards often hire these individuals for their prowess in M&A activities. In the past decades, much has been discovered on the different traits of CEOs and their effect on several performance measures within the M&A environment.

In recent literature, Malhotra, Reus, Zhu, and Roelofsen (2018) write about how extroversion influences CEO decision-making and the ensuing strategy behaviour of their respective firms. They find that extroverted CEOs are more likely to engage in M&A activity, and generally larger deals. Subsequent analysis of the extroverted CEOs shows that they are more likely to succeed in M&A, reflected in stronger abnormal returns following acquisition announcements. Plaksina, Gallagher, and Dowling (2019) perform an analysis on the social status of CEOs and their respective M&A decision-making. They find that CEOs with both ascribed (measured through prestigious education) and achieved (measured through received awards) social status reduce M&A activity. Moreover, the effect is most prevalent for executives who retain both status types. However, whereas ascribed status appears to have a permanent effect, achieved status only significantly influences the CEO in the aftermath of said achievement. This paper aims to combine these two ideas, namely 1. A CEO characteristic or trait can influence M&A success, reflected by stronger abnormal returns, and 2. Ascribed social status influences M&A success. More specifically, this paper aims to measure the effect of a CEO's education on firm performance and share performance after M&A activity.

Education is an interesting CEO characteristic, especially considering three of the largest companies in the U.S. were founded and run by college dropouts. Steve Jobs, the founder of Apple, was a college drop-out at just 19. Bill Gates, the founder of Microsoft, was a college dropout at 20. Travis Kalanick, the founder of Uber, was a college drop-out at 21. Three of arguably the most successful men in recent business history all lacked a regular education but no one can dispute their achievements. Nonetheless, the effects of education on success have been adequately documented in research papers throughout history. Williams and Harrell (1964) wrote one of the earliest papers on how education can be a predictor of success. In their paper, they study 196 Stanford graduates and find no significant correlation between their obtained GPA, as an (under)graduate, and their respective wages 15 years later. However, Williams and Harrell (1964) do find that if a student excelled in their elective courses that they were likely to succeed in business. The paper by Robinson and Sexton (1994), debunks the previously mentioned drop-out folklore, showing that highly educated people are more likely to be an entrepreneur and are also more likely to be successful entrepreneurs. In a more recent paper by Gounopoulos,

Loukopoulos, and Loukopoulos (2020), CEO education is explored in relation to the level of underpricing around the time of an IPO. They find that CEOs with higher credentials have significantly lower levels of underpricing.

Another effect at play when looking at publicly listed share prices and CEO education is the signalling effect. In their paper, Zhang and Wiersema (2009) wrote about the effects of the ascribed social status of a CEO on the performance of a publicly listed stock. Specifically, Zhang & Wiersema find that since the Enron scandal a properly ascribed CEO signals good fortune around the time of publishing financial statements (Sterling, 2002), (Li, 2010), (Petrick & Scherer, 2003). These companies with highly ascribed CEOs, therefore, saw an abnormal return around the time of publishing. In a different paper by Gomulya and Boeker (2014) on the signalling effect of CEO education, the authors argue that certain attributes of successor CEOs - such as education - can play a key role. Specifically, firms that need severe restatements of financial publications due to the failure of previous leadership, look for CEOs with previous turnaround experience and an elite level of education. They find that these companies have a strong signalling effect, which is measured by stock market performance and reactions of financial analysts and mass media.

In this paper education will be categorized into three dimensions and subsequently assessed separately, inspired by the paper by Gounopoulos et al. (2020). The first dimension will be the education dimension of knowledge measured by their highest completed education (undergrad, bachelor, master or MBA, doctorate), the second dimension will be the education dimension of distinction which is measured by whether they completed their last education with honours, distinction or cum laude the third and final dimension will be the education dimension of prestige, this is measured by whether the university is an Ivy League university. This paper will look at the short-term buy-and-hold abnormal returns, also called the announcement buy-and-hold abnormal return in this paper, and at the one and two-year buy-and-hold abnormal return, also called the long-term buy-and-hold abnormal return in this paper. Buy-and-hold abnormal return will hereafter be abbreviated to BHAR.

The data set used in this paper will be comprised of executives that acted as the CEO of a S&P500 company during the period between 2010 and 2019. The purpose of this paper is to explore the concept of CEO education in relation to firm performance and firm value. There is not a lot of literature on this topic out there as it stands, rather, a lot of research on CEO education was done quite recently (Plaksina et al., 2019), Gounopoulos et al. (2020). Therefore, this paper aims to contribute to previous literature by specifically looking at how CEO education affects firm performance and firm value after an acquisition. To do this, the paper will capture the abnormal returns of S&P500 listed

companies around the time of a M&A announcement and see whether different dimensions of education of the acting CEO can be a good predictor for higher-than-average abnormal returns. By measuring the effect around the time of announcement and the effect a few years after an acquisition, this event study will look at the short-term BHAR (signalling) and long-term BHAR (improved performance), respectively.

The remainder of the paper is structured as follows. Section two provides a theoretical framework, where recent and past literature on this subject and its concepts is discussed. After the review and explanation of concepts, I develop hypotheses to answer my research question: What is the effect of a CEO's education on firm performance and share performance after acquisitions? Section three discusses the data sample and key variables and methodology used in the analysis. Section four presents the empirical evidence for my hypotheses, describes the results derived from analyzing the data, and provides summarized tables of the most important findings of this paper. After presenting the results of the tests, I will conclude and discuss my research question also relating to past evidence. Finally, I will discuss the limitations of the study and propose suggestions for future research.

2 Theoretical framework and hypothesis development

In this section, the theoretical and empirical literature on the impact of CEO characteristics on firm performance and M&A performance will be discussed. This paper combines the different preceding papers on CEO characteristics and specifically education to answer the main research question on the effect of a CEO's education on firm performance and share performance after acquisitions. Two precedents of literature on this topic will be combined, these two precedents are 1. A CEO characteristic or trait can influence M&A success, reflected by stronger abnormal returns, and 2. Ascribed social status (education) influences M&A strategy. Hypotheses are formed around these strands of literature. These hypotheses will look at the abnormal returns and observe if there is any significant relationship between the abnormal returns and the CEO education dimensions. Furthermore, this paper tries to explore CEO education with additional hypotheses.

2.1 The impact of CEO characteristics on firm performance

Chief executive officers (CEOs) are undoubtedly the most prominent people in business. Much of this infamous status comes from the fact that many of these CEOs are perceived as the apex of corporate life, the key decision-makers for multi-billion and even trillion-dollar companies. As a starting young professional you look up to these CEOs, similar to how an aspiring musician looks up to Stevie Wonder, Jimmi Hendrix, or Beyoncé.

However, there's also a large population who look cynically at these corporate stars. As observed in the Enron scandal (Zhang & Wiersema, 2009), CEOs can make devastating mistakes that affect people where it hurts them the most, their wallets. Enron was only one of the most prominent scandals or mistakes in recent history, however, it was far from an outlier. Outrage by investors is often the reaction, fueled by these waves of corporate scandals.

The paper by Bertrand (2009) throws light on the role of CEOs as she reviews the literature on CEOs, the role of CEOs' and CEO compensation. Specifically, Bertrand discusses the value of having a general skill-set over a firm-specific skill set, the underrepresentation of women as CEOs (Bertrand & Hallock, 2001) and the overrepresentation of family members as CEOs (Bertrand & Schoar, 2006). Finally, she reviews the different explanations for the surge in CEO compensation over the past decades and the risks of CEO entrenchment.

Adams, Almeida, and Ferreira (2005) write their paper on the impact of CEOs on corporate performance. In their paper, they look at 336 Fortune 500 firms over the period from 1992 to 1999 to find evidence of the impact CEOs' decisions can have on the firm's performance. They find evidence that firm performance is more variable when the decision-making power is focused around the CEO with little oversight. In a different paper, by (Teti, Dell'Acqua, Etro, & Volpe, 2017), the authors observe through a regression analysis of the abnormal returns of around 1600 acquisitions in the U.S. between 2009 and 2013 that board dependency, CEO duality, and CEO fixed compensation are important variables determining the abnormal returns of these acquisitions.

In a different paper, Bennedsen, Perez-Gonzalez, and Wolfenzon (2006) estimate the value of top executives by performing a two-fold test on the impact of CEOs on performance. First, Bennedsen et al. observe whether the death of a top executive - in their paper a CEO or board member - has any significant impact on the firm's performance. Secondly, they look at events of the death of direct family members of top executives. The first test observes the effects of the removal of the top executives, whereas the second test observes a distracted and occupied top executive. They find that in both cases firm performance declines significantly and therefore the conclusion is that CEOs are extremely important for a firm's performance. Following this rhetoric, since CEOs are important to firm performance, the first hypothesis (H1) will be to examine whether higher dimensions of education significantly and positively influence firm performance.

2.1.1 Education

Hambrick and Mason (1984) is one of the most seminal papers written on CEO characteristics. In this literary review, Hambrick & Mason review the different papers written on

the topic of CEO characteristics at the time. In their paper, they propose a new model of decision forming called the 'Upper Echelons Perspective of Organizations' in which characteristics of top decision-makers are incredibly influential on performance outcomes. They argue that it comes down to 7 major characteristics of the top executives. These characteristics are age, professional experience, non-professional experience, education, socioeconomic roots, financial ownership, and group characteristics. The major characteristic of interest in this paper will be education.

In a more recent paper, (Kaplan, Klebanov, & Sorensen, 2012) look at several different papers about CEO characteristics and their impact on firm performance. These include influential papers from (Bertrand & Schoar, 2003), (Adams et al., 2005), (Bennedsen et al., 2006) which were discussed earlier in this paper as well. In this paper by Kaplan et al., performance is measured for several venture capital(VC) and private equity (PE) before and after take-over. They observe the newly hired or incumbent CEOs and measure the performance of these freshly acquired companies after said CEO has assumed the position of top decision-maker. Kaplan et al. main conclusions are that characteristics that capture general ability, such as education, and execution ability, such as industry-specific know-how are positively related to firm performance.

A CEO's formal educational background can produce valuable and intricate data on that individual. A person's degree says a lot about their potential for success, most definitely in their area of expertise. This area of expertise also likely changes the cognitive base, or simply put how someone thinks (Hambrick & Mason, 1984). The benefits of having a formal education have been tested extensively. Williams and Harrell (1964), Robinson and Sexton (1994), Kolstad and Wiig (2015) all wrote important and recognized papers on the benefits of education. However recent papers by Petrick and Scherer (2003), Sterling (2002), Li (2010) tell a bit more about how critical proper education can be.

This paper will assume that highly educated CEOs have relative operational excellence compared to their lesser-educated peers, thus creating more value from acquisitions. This assumption will be tested in two hypotheses. Firstly, the second hypothesis (H2) will test whether a CEO with a higher attained degree (dimension of education) will have greater operational qualities resulting in higher-than-average long-term abnormal returns. The third hypothesis (H3) will observe whether a CEO that completed their degree with distinction (dimension of distinction) will have greater operational qualities resulting in higher-than-average long-term abnormal returns.

Zhang and Wiersema (2009) wrote a seminal paper on the signalling effect of a CEO's education. They find that the effect of this person's qualifications on the effect of shareholder perception is often greater than their actual policies. (Zajac & Westphal, 2004) go further into this theory as they prove that share performance increases when

policies or strategies are announced even when they end up not being implemented. This effect is stronger for firms with a well-ascribed CEO announcing these policies. Moreover, a degree from a top-rated institution can be a testament to a CEO's unobservable tenacity and talent to persevere in an arduous environment(Miller, Xu, & Mehrotra, 2015) (Certo, Daily, Cannella Jr, & Dalton, 2003). As well as that it signals as an indicator for a potentially powerful and influential social network(Colombo, Meoli, & Vismara, 2019)(Datta & Iskandar-Datta, 2014).

Certo (2003), Certo, Daily, and Dalton (2001), Cohen and Dean (2005), Higgins and Gulati (2006) and Higgins and Gulati (2003) all wrote papers on the effects of an executives background on firm value. These background characteristics behave as a positive signal towards external shareholders when they announce strategic or policy decisions. (Cohen & Dean, 2005), (Higgins & Gulati, 2006) especially write about the short-term appreciation of perceived share value at the time of an IPO. They do however all conclude that the magnitude of the effects of signalling is difficult to ascertain due to many exogenous variables. Nevertheless, in light of these research papers, this paper will also test whether the short-term abnormal returns are stronger for CEOs that are well educated in line with this signalling theory.

This paper will assume that a CEO's education affects the short-term BHAR through the aforementioned signalling effect imposed by their academic credits. A CEO's extraordinary academic results - be it graduating cum laude or obtaining a doctorate - is public information. That said, the fourth hypothesis (H4) tests whether a CEO that attained their degree with distinction will see a higher-than-average short-term abnormal return in line with the signalling theory. Moreover, the fifth hypothesis (H5) will evaluate whether a CEO with a doctorate will see a higher-than-average short-term abnormal return in line with the signalling theory. Finally, the sixth hypothesis (H6) will assess whether a CEO that attained their degree at an Ivy League university will see a higher-than-average short-term abnormal return in line with the signalling theory

2.2   CEO Overconfidence

In Malmendier and Tate (2005) and Malmendier and Tate (2008) the importance of CEO overconfidence is discussed and empirically tested. They measure CEO overconfidence with two proxies. The first proxy of CEO overconfidence is measured as the level of over-investment in their own company, the second proxy is measured by the CEO's portrayal in the media. The paper concludes that overconfident CEOs are more likely to make acquisitions and experience a significantly more negative market reaction. Furthermore, it cannot be overstated that CEO overconfidence can also play a vital role in the making of acquisitions (Ferris, Jayaraman, & Sabherwal, 2013), (Brown & Sarma, 2007). Overcon-

fident CEOs are often prone to making a lot of bad acquisitions in quick succession. This is dubbed empire building (Hope & Thomas, 2008). Empire building can be detrimental to share performance as overconfident CEOs often make bad acquisitions where projected operational synergies cannot be obtained.

Hagendorff, Liu, and Nguyen (2021) research a new type of overconfidence and argue that it is often culture-dependent. They find that in the U.S. having an education from Ivy League is a characterization of CEO overconfidence. Ivy League is specifically seen as the CEO overconfidence proxy because the other two dimensions are by definition hard-earned. Contrarily, going to an Ivy League university might not always be an indication of your hard work but often also a result of your socio-economic background (Hagendorff et al., 2021). To this extent, the seventh and final hypothesis (H7) that will be tested is whether a CEO that attained their degree at an Ivy League university will see a lower long-term abnormal return due to making bad acquisitions more often.

2.3 Fama and French 3-factor model (1993)

With over 30000 citations, it is clear that (Fama & French, 1993) wrote one of the most influential papers in recent history. Their paper is a cross-section of average stock return in several stock markets in the United States from 1963 until 1990. They find that the size and the book-to-market ratio play a significant and empirical role in explaining the cross-section of average returns on NYSE, Amex, and NASDAQ stocks. Since this paper, Fama & French's 3-factor model is often adopted as the reference model for generating normal returns in event studies with a long horizon. The model would look like the following:

$$R_{it} - Rf_t = \alpha_i + \beta_i(Rm_t - Rf_t) + s_i SMB_t + h_i HML_t + \epsilon_{it} \tag{1}$$

In this model SMB ("small minus big") is the difference in return between a portfolio of small firms and a portfolio of large firms measured by their market capitalization, and HML ("high minus low") is the difference in return between a portfolio of value firms and a portfolio of growth firms. This model supports the calculations of abnormal returns greatly with improved expected returns estimations.

2.4 M&A performance

The real value of M&A activity has long been discussed and tested (Campa & Hernando, 2004), (Hassan, Patro, Tuckman, & Wang, 2007), (Cummins & Weiss, 2004) (Rani, Yadav, & Jain, 2015). Nevertheless, with all this research, the conclusions are still ambiguous at best. Rani et al. (2015) writes about how most of the abnormal returns are obtained in the short-term window around the announcement date of a merger or acquisition. They

find that in the case of payment by stocks, the cumulative abnormal returns are only permanent in cross-border deals and that shareholders maximize value by selling shares soon after the announcement or better yet, during the pre-announcement window (with inside information). However, cash payments do tend to net permanent abnormal returns. In a recent paper, Ying and He (2020) find in their study on China's A-share listed companies that CEOs' financial and accounting education experience play a significant role in their M&A decision-making and the M&A performance of these A-share listed companies. Subsequent tests prove that CEOs with higher education in finance or accounting improve the efficiency of M&A by decreasing the purchase premium, shortening the integration process, and greatly bolstering the synergistic effects of M&A.

3 Methodology and Data

3.1 Data

This section will provide the empirical foundation for this paper. The methods and data discussed in this section aim to answer my research question *What is the effect of a CEO's education on firm performance and share performance after acquisitions?* For data on CEO education a dataset from BoardEx was used. Execucomp was used for CEO age, tenure, total compensation, etc. For all information on securities CRSP and Compustat - Capital IQ was used. Moreover, the M&A activity was retrieved from a Bloomberg Terminal. Fundamental data such as size, R&D expenditure and outstanding debt were also retrieved from Compustat - Capital IQ. The abnormal returns are retrieved from Wharton Research Data Service (hereafter named "WRDS") event-study tool.

This paper will analyse a sample of 257 S&P500 constituents between 2010 and 2019. All 257 constituents have been part of the S&P500 for the entire duration of the tested data. The choice for this particular data set is mostly driven by the scarcity of data and the likeness of S&P500 constituents, among their peers, in market size. Moreover, including only the constituents who have been incumbent for the entire duration reduces the likelihood of shocks and outliers in the data. For this paper, a time horizon was chosen after the financial crisis, hence, 1st January 2010 served as the starting point of this analysis. The time horizon deliberately stops on 31st December 2019 to prevent overlap with the corona-crisis that started around March 2020 in the U.S. Due to the many different data sources used for this research, several of the data sets had to be cleaned rigorously to merge properly. First, the observations of Execucomp were scrubbed clean to merge with the fundamental data from Compustat - Capital IQ. Please reference Table A.1 on page 29 the summary statistics of this data set after the merging of Execucomp and

Compustat - Capital IQ. After this merger 219 uniquely identified constituents remained.

Table 1: Summary statistics of the variables after merging the education data from BoardEx with the fundamental data set from Compustat - Capital IQ

VARIABLE	Obs.	Mean	S.D.	Min	Max
Salary	1009	$ 1,207.29	$ 358.28	$ 0.00	$ 2,800.76
Total Compensation	1009	$ 13,736.79	$ 7,269.14	$ 1,681.84	$ 43,490.57
Total Assets	1009	$ 45,645.09	$ 62,927.22	$ 2,352.68	$ 323,888.00
Capital Expenditure	1009	$ 2,002.81	$ 3,781.35	$ 0.00	$ 19,635.00
Net Income	1009	$ 2,747.99	$ 4,458.58	$ (4,068.00)	$ 23,040.00
PPE Net	1009	$ 13,742.26	$ 26,551.11	$ 111.30	$ 150,629.00
R&D Expenditure	1009	$ 1,021.05	$ 2,376.14	$ 0.00	$ 14,236.00
Cashflow	1009	$ 4,587.61	$ 7,147.35	$ (3,007.10)	$ 41,088.00
Market Equity	1009	$ 61,364.06	$ 110,442.40	$ 3,047.82	$ 2,064,811.00
Interest-bearing debt	1009	$ 13,492.78	$ 19,562.31	$ 0.00	$ 117,978.00
Operating Assets	1009	$ 29,619.91	$ 40,093.34	$ 802.16	$ 257,045.00
Market Value Assets	1009	$ 87,783.55	$ 137,037.40	$ 4,720.76	$ 2,256,405.00
CEO Age	1009	56.67	6.07	40.00	82.00
CEO Tenure	1005	9.94	7.72	0.08	57.37
Female	1009	0.08	0.27	0.00	1.00
TobinQ	1009	2.25	1.40	0.60	11.66
ROA	928	0.08	0.07	-0.13	1.51
ROE	928	0.36	5.18	-52.46	140.61
Book Leverage	1009	0.45	0.23	0.00	2.32
Market Leverage	1009	0.20	0.13	0.00	0.71
Undergrad	1009	0.05	0.22	0.00	1.00
Bachelor	1009	0.35	0.48	0.00	1.00
Master or MBA	1009	0.40	0.49	0.00	1.00
Doctorate	1009	0.15	0.35	0.00	1.00
Cum Laude	1009	0.06	0.24	0.00	1.00
Honours	1009	0.03	0.17	0.00	1.00
Ivy League	1009	0.14	0.35	0.00	1.00
Unique firms	142				

The second major data set used in this data was the BoardEx data set on the education of the CEO's. The data on education was first cleaned and organized separately and subsequently merged with the combined data set from Execucomp and Compustat - Capital IQ. This data set also included executives other than CEOs, like CFOs and COOs. For each unique executive, the observation with the highest degree was kept. Sequentially, this data set was merged based on CEOs' names with our fundamental data set which automatically removed the executives that did not act as CEOs. This resulted in the data set with 142 unique firms and 1009 observations that can be found in Table 1. The financial data variables are in thousands of dollars. An exhaustive list of the different variables can be found in appendix A.5 and appendix A.6. The average CEO age in this

data set is 56.67. CEO Tenure is defined as the tenure of a unique CEO within the data set, if the CEO was still in office the tenure was set to the end of this research its time horizon (31st December 2019). The average tenure of a CEO in the data set is 9.94. In this paper, the sample has around 8 per cent of the observations have a female CEO.

Three variables will be the dependent variable of interest to measure firm performance. TobinQ is defined as the market value assets divided by the total assets. Return on assets ("ROA" in Table 1) is the gross income divided by the average total assets at t-0 and t-1, the average ROA in this sample is around 8 percent. Return on equity ("ROE" in Table 1) is the net income divided by the shareholder equity at t-0 and t-1, the average ROE in this sample is around 36 per cent. Book leverage is the interest-bearing debt divided by the operating assets, book leverage averaged 45 per cent in this data set. Market leverage is the interest-bearing debt divided by the market equity plus the interest-bearing debt. This averaged 20 per cent in this data sample.

The last 7 variables are the primary independent variables of interest in this paper. The first four variables are in the education dimension of knowledge and are all dummy variables indicating the obtained degree of the CEO. Undergrad is a dummy variable that is given to CEOs with an associates-degree or college degree, approximately 5 per cent are undergrad in this paper its sample. Bachelor is a dummy variable that is given to CEOs with a bachelor's degree, in the sample approximately 35 percent of the observations have a bachelor's degree as their highest obtained degree. Master or MBA is also a dummy variable given to CEOs who obtained a master's or MBA, approximately 40 percent of the observations fall under this category. These were bundled together in one variable, as both are fairly similar in difficulty to obtain. Finally, Doctorate is a dummy variable that is awarded to CEOs that obtained a doctorate in any curriculum. Approximately 15 percent of the CEOs in the sample had a doctorate of some sort.

The fifth and sixth independent variables of interest are in the education dimension of distinction and indicate whether the CEO graduated with merit. Cum Laude is a dummy variable that indicates whether a CEO completed their degree with a cum laude, magna cum laude or summa cum laude qualification. These three were bundled together to prevent omitted variables as much as possible as the observations per category were on the lower side. In this data set, approximately 6 percent of the CEOs obtained their degree with a cum laude qualification. Honours is a dummy variable that indicates whether a CEO completed their obtained degree with honours or distinction. In this data set, approximately 3 percent of the CEOs graduated with honours or distinction.

The seventh and final variable of interest is the education dimension of prestige and indicates whether the CEO attended one of the eight Ivy League universities. Ivy League is a dummy variable that indicates whether the degree was obtained at an Ivy League

university. Approximately 14 percent of the CEOs in this sample have obtained their degree at one of the eight Ivy League universities.

After the BoardEx data has merged with the Execucomp and Compustat - Capital IQ data one final data merge needs to take place. The events for this event study are acquisitions where the S&P500 constituent acts as the acquirer. The data was first retrieved from Bloomberg. The data was retrieved on the basis that it was an acquisition of the majority of the shares, the deal was a 1-on-1 deal meaning there was only one buyer and one seller, and finally, the deal had to take place between 1st January 2010 and 31st December 2019. A total of 3584 transactions were selected. After this, all financial deals, and deals with a total deal value below $5M were removed from the sample. Moreover, deals with missing data were also removed. In the end, 937 transactions were used to retrieve abnormal returns from WRDS its event-study tool for the Announcement BHAR, 1-year BHAR and 2-year BHAR. The specifications of the three different event studies were the following:

Announcement BHAR - Estimation window t-305 up to t-55, gap window t-55 up to t-5, event window t-5 up to t+5

1-year BHAR - Estimation window t-300 up to t-50, gap window t-50 up to t-0, event window t-0 up to t+250

2-year BHAR - Estimation window t-550 up to t-50, gap window t-50 up to t-0, event window t-0 up to t+500

An observation was automatically dropped if the estimation window encountered any irregularity. For that reason the longer the estimation window the more observations failed the criteria. The abnormal return data sets were merged with the data sample of Table 1. The final data sets used for the BHAR regressions can be found in Table A.2A.4 on page 30-31.

Table 2: Industry Groups and distributions

Industry	Freq.	Industry	Freq.	Industry	Freq.	Industry	Freq.	Industry	Freq.
Com. Services	0.03	Cons. Staples	0.12	Health Care	0.13	I.T.	0.14	Real Estate	0.07
Cons. Disc.	0.13	Energy	0.06	Industrials	0.16	Materials	0.07	Utilities	0.07

Table 2 displays the distribution of industries in the final data set, which varies marginally across the three different BHAR sub-sets. The three biggest industries are industrial, information technology (hereafter named "I.T.") and health care, with respectively 16 per cent, 14 per cent and 13 per cent of the sample being those industries. Overall the distribution of industries is sufficiently scattered for proper analysis.

3.2 Methodology

3.2.1 Regressions

To measure the effect of CEO education on a firm's M&A performance a two-step analysis will be conducted. The first step was an event study to obtain abnormal returns from the selected stocks. Secondly, the abnormal returns from the event study were used as the dependent variable in an OLS regression against the main independent variables concerning education, and several other control variables. In this paper, the event will be the date of the announcement of a merger or acquisition of a publicly listed S&P500 company.

To quantify the performance of an event in an event study, researchers often observe the abnormal return of the event. Simply put, the abnormal return describes the abnormal gains and losses from an event reflected in the share price. It is derived in an event study when the difference between the return on a share and the expected return of that share before the event is observed. This event could be the death of a CEO or the announcement of a takeover for example.

The expected return is usually derived in either of two ways. The first is the Market Model in which the returns come directly from the performance of a broad portfolio such as the S&P500 Index. The other model often used is the 3-factor model introduced by Fama and French (1993). With this model, the abnormal returns are measured against the expected returns of companies of similar size. This paper will use the Fama & French 3-factor model to calculate the abnormal returns from the observed events. Furthermore, the numeric variables in this paper are winsorized at the 1 percent level. By winsorizing the numeric data, the regressions are much less likely to be skewed by an extremely high or low value within the numeric values.

Finally, there are also two methodologies for measuring abnormal returns over a period of time. These two methods are cumulative abnormal return (CAR) and buy-and-hold abnormal return ($BHAR$). Although both reliable and well-tested methods the two differ in one essential way. The CAR is an arithmetic way of calculating the abnormal return and the $BHAR$ is a geometric way of calculating the abnormal return. According to several papers, (Lyon, Barber, & Tsai, 1999), (Chahine, 2004), (Barber & Lyon, 1997) the $BHAR$ is generally more suitable to perform analysis on long-run event studies. Besides looking at short-term abnormal returns, this research will look at the performance of the long-run abnormal return therefore the $BHAR$ will be the chosen methodology for this paper.

In the first step, this paper looks at two event windows. The short-term window of five working days before the announcement and five working days after the announce-

ment of a merger or acquisition is hereafter referred to as *Announcement_BHAR*. The second window will be on the day of the announcement and 250 working days after the announcement - which is about a full calendar year - hereafter referred to as *1-Year_BHAR*. The third window will be on the day of the announcement and 500 working days after the announcement - which is about two full calendar years - hereafter referred to as *2-Year_BHAR*. The formula for *BHAR* is:

$$BHAR_i = \prod AR_{it} \tag{2}$$

$$AR_{it} = R_{it} - (Rf_t + \beta_i * Rm_{it}) \tag{3}$$

The risk-free rate Rf_i, is the yield on a 10-year government bond for the corresponding event window. The betas are the slopes calculated by taking the 5-year monthly return of the stock and plotting it against the S&P500 Index 5-year monthly return.

In the second step of the analysis, a cross-sectional regression is performed on the BHAR of each security against the CEO education dimensions. The following regressions, including variations of these, will be performed throughout the empirical section of this paper to observe the effects of the different key variables on the BHAR. Numerous control variables such as age, tenure & gender are included in the regressions to increase the internal validity of this research by decreasing the influence of confounding and other incidental variables.

$$BHAR = \alpha + D_1 Xi + \gamma ControlVariables + FE_i + FE_y + FE_c + \epsilon_i \tag{4}$$

$$
\begin{aligned}
BHAR = {} & \alpha + D_1 Education_i + D_2 IvyLeague_i + D_3 Distinction_i \\
& + \gamma ControlVariables + FE_i + FE_y + FE_c + \epsilon_i
\end{aligned} \tag{5}
$$

Where:

$BHAR$ = The abnormal returns from M&A activity

$D_1 Xi$ = One out of the three education dimensions

$Education_i$ = The highest type of education completed

$IvyLeague_i$ = Whether the university is an Ivy League constituent

$Distinction_i$ = Whether the last education completed was completed with distinction

$\gamma ControlVariables$ = Several CEO control variables such as age, tenure & gender

FE_i = Fixed effects for industry
FE_y = Fixed effects for year
FE_c = Fixed effects for company
ϵ_i = Error term

3.2.2 Endogeneity and heteroscedasticity

The paper by Roberts and Whited (2013) does well in explaining how much of an issue endogeneity can pose in empirical corporate finance research. Firm performance, CEO characteristics and firm policies and strategies are often jointly determined and could cause meaningful endogeneity problems (Hermalin & Weisbach, 1988). To illustrate this issue take this example, this paper assumes that higher levels of education will positively impact firm performance and operational performance. If this hypothesis were to be proven, one must ask oneself whether this was indeed due to higher intelligence or another underlying and unobserved variable. It is challenging to fully rule out endogeneity, however, it is important to try to rule out as much as possible. The paper used the following techniques to dispose of as much endogeneity as was deemed feasible.

First, this paper uses fixed effects for both year, industry and firm in most of the regression and is otherwise stated to not include them. Including fixed effect errors correct of unobserved heterogeneity that is constant over the sample (Allison, 2009). Second, several control variables are included in the regressions to ameliorate some of the endogeneity. More details on the control variables can be found in Table E.1-E.4 on page 44-46, mostly the same control variables as in Gounopoulos et al. (2020) were used. With most importantly, CEO age is the control variable for knowledge and CEO tenure as firm-specific know-how. Heteroscedasticity was accounted for through robust standard errors and is clustered at the industry level. There was also an attempt to use an instrumental variable. For a proper IV, the instrument would have to affect our dependent variable only through its effects on the different dimensions of education. However, this proves to be quite difficult, as firm performance is correlated to an abundance of different factors. As a thought exercise, the paper could assume that the kind of teacher a CEO had as a child affects that CEO's path to further education. Without using the proper tests, this could on paper be a successful first-stage IV. However, this IV would not meet the exclusion restriction as this teacher could also have affected other characteristics of the CEO, such as their (over)confidence. Unfortunately, all the variables experimented on were too weak or inconsistent to be proper instruments. The IV in Gounopoulos et al. (2020) could not be recreated for this research.

4 Results

In this section, the empirical results of this research will be discussed extensively. In the first section, the three dimensions of education concerning firm performance are discussed. Secondly, the three dimensions are discussed in relation to the short-term announcement BHAR. Finally, the three dimensions are discussed in relation to long-term BHAR.

The R-squared appears to be fairly high for many of the models, which is not surprising considering the independent variables are closely correlated (Lavery, Acharya, Sivo, & Xu, 2019). If observation A is not an undergraduate there is a 90 percent - since 95 percent of the sample had a degree as shown in Table 1 chance he or she has one of the other three independent variables related to the dimension of knowledge. However, the R-squared is incredibly high which could be an indication of an imprecise model, thus, the results remain to be discussed further in the conclusion of this paper. A summary of all three event windows can be found in the appendices in Table A.2 and Table A.4.

4.1 Firm Performance

Table 3 shows a summary of the tables B.1-B.3 on page 34-36. In these multivariate OLS regressions, the three dimensions of education are regressed against three measures of firm performance. In Table 3, specification (1) includes Tobin's Q as the dependent variable proxy for firm performance, specification (2) includes ROA as the dependent variable proxy for firm performance, and finally, specification (3) includes ROE as the dependent variable proxy for firm performance. These measures have been thoroughly discussed in literature preceding this paper by the likes of Lang and Stulz (1994) and Wernerfelt and Montgomery (1988), but also in more recent papers (Mashayekhi & Bazaz, 2008), (Robb & Watson, 2012), (Lin, 2011).

For Tobin's Q performance measure, only one variable of interest is significant at the 5 per cent level. The independent variable Ivy League is significantly negative at the 5 per cent level with a coefficient of -1.195. Tobin's Q is the ratio between an asset's market value and its asset's book value. This would imply that - ceteris paribus - a CEO from an Ivy League university either decreases the market value or increases the book value. It could be that Ivy League graduates are more likely to lead value companies rather than growth companies. These value companies usually have lower Q's than growth companies (Sauaia & Castro, 2002).

Table 3: Multivariate OLS regressions with firm performance measures

VARIABLES	Tobin's Q	ROA	ROE
	(1)	(2)	(3)
Undergrad	-0.144	-0.056***	-0.995
	(0.375)	(0.010)	(0.898)
Bachelor	-0.327	-0.026**	-0.891
	(0.286)	(0.009)	(0.897)
Master or MBA	-0.373	-0.029**	-1.166
	(0.352)	(0.012)	(1.055)
Doctorate	0.437	-0.009	-1.217
	(0.261)	(0.009)	(0.879)
Cum Laude	-0.334	0.002	-1.690
	(0.268)	(0.021)	(1.309)
Honours	0.043	0.004	1.142
	(0.257)	(0.017)	(1.462)
Ivy League	-1.195**	0.002	0.061
	(0.413)	(0.011)	(0.428)
CEO Age	0.019	-0.001	-0.006
	(0.013)	(0.001)	(0.027)
CEO Tenure	-0.018*	0.000	0.014
	(0.009)	(0.000)	(0.013)
Female	0.193	0.002	0.141
	(0.220)	(0.006)	(0.336)
Cashflow	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)
Book Leverage	1.607***	-0.024***	-0.925
	(0.396)	(0.007)	(2.393)
Market Leverage	-4.989***	-0.215***	0.360
	(0.697)	(0.032)	(2.577)
Constant	1.920**	0.161***	1.068
	(0.772)	(0.028)	(1.228)
Observations	996	912	912
R-squared	0.869	0.523	0.109
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Moving on to the ROA specification, other independent variables of interest can be observed that are highly significant. The independent variables Undergrad, Bachelor and Master or MBA are significant at respectively the 1 per cent, 1 per cent and 5 per cent level. Surprisingly, each variable affects the ROA negatively. In this data set having an undergraduate, bachelor or master's degree is equal to a lower ROA by 5.6 per cent, 2.6

per cent and 2.9 per cent, respectively. This is quite substantial and of note due to the implications that these results have on the hypothesis. The reason behind these findings could be that since the data set is filled with some of the highest performing individuals - CEOs of some of the largest companies in the world - in comparison to the rest having a degree other than a doctorate decreases the ROA. Finally, for the ROE specification, this paper did not find any significant results.

4.2   Announcement BHAR

According to theory, it is expected that the dimensions of education increase the announcement BHAR due to signalling. In Table 4 the different independent variables are regressed against the dependent announcement BHAR to create a baseline of understanding of how these variables interact with the BHAR. The announcement BHAR had 412 events and the R-squared ranges from 0.294-0.299 and every regression include fixed effects for year, industry and firm. Cum Laude appears to affect the abnormal returns significantly and positively at the 1 per cent level with a coefficient of 0.078, meaning that a CEO that graduated Cum Laude increases the short-term BHAR by 7.8 per cent. This is in line with the thoughts of Certo et al. (2001) and Colombo et al. (2019) about the signalling effect.

Honours is also positively significant, albeit, only at the 10 per cent level. Nevertheless, it still adds to the empirical evidence. Having a doctorate also appears to significantly and positively affect short-term BHAR at the 10 per cent level. Moreover, Undergrad is negative and significant at the 5 per cent level with a coefficient of -0.033 meaning a CEO with an undergraduate degree has on average a lower BHAR of 3.3 per cent. This could also be related to the signalling theory, due to suppositions investors have on undergraduate CEOs.

In Table 5 a multivariate OLS regression was run to see whether the same variables that were significantly affecting the announcement BHAR in a vacuum, have similar effects when regressed simultaneously with the other independent variables of interest. Specification (1) is a multivariate regression with the dimensions of distinction and prestige as the independent variables. Specification (2) is a multivariate regression with the dimension of knowledge as the independent variables. Specification (3) combines the two specifications in one complete model.

Table 4: Single-variate OLS regressions with Announcement-BHAR as the dependent variable and educational dimension measures as independent variables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	0.078***						
	(0.007)						
Honours		0.020*					
		(0.009)					
Undergrad			-0.033**				
			(0.013)				
Bachelor				0.004			
				(0.007)			
Master or MBA					-0.009		
					(0.009)		
Doctorate						0.017*	
						(0.008)	
Ivy League							0.013
							(0.012)
Constant	-0.003***	-0.000	0.001***	-0.001	0.003	-0.003*	-0.001
	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.001)	(0.001)
Observations	412	412	412	412	412	412	412
Number of industry	0.299	0.294	0.294	0.294	0.295	0.298	0.294
Year FE	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In specification (3) a number of interesting results appear. The variables Undergrad, Bachelor, Doctorate and Cum Laude are significant. Undergrad is negative and weakly significant at the 10 per cent level, nevertheless, it gives further evidence to what was observed in Table 4 and adds to the idea that lower education signals bad fortune to shareholders. Moreover, Bachelor and Doctorate are significant at the 5 and 10 per cent level, respectively. Having a bachelor's degree increases the announcement BHAR by 1.9 per cent on average and a doctorate increases the announcement BHAR by 2.8 per cent, on average, according to these findings. In specification (2) these percentages go up to 2.0 and 3.1 for Bachelor and Doctorate, respectively. Also, Doctorate is significant at the 5 per cent level in this specification. Finally, the most significant finding of Table 5 is the independent variable Cum Laude, which is significant at the 1 per cent level in both specifications (1) and (3). This adds to the results found in Table 4, giving further evidence to the signalling theory.

Table 5: Multivariate OLS regressions with announcement BHAR as the dependent variable and educational dimension measures as independent variables

VARIABLES	(1)	(2)	(3)
Undergrad		-0.023	-0.020*
		(0.018)	(0.009)
Bachelor		0.020**	0.019**
		(0.006)	(0.006)
Master or MBA		0.009	0.008
		(0.006)	(0.005)
Doctorate		0.031**	0.028*
		(0.009)	(0.013)
Cum Laude	0.078***		0.077***
	(0.007)		(0.007)
Honours	0.021*		0.008
	(0.009)		(0.017)
Ivy League	0.012		0.004
	(0.013)		(0.019)
Constant	-0.005**	-0.015**	-0.018***
	(0.002)	(0.005)	(0.004)
Observations	412	412	412
R-squared	0.301	0.302	0.307
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 is the final table of this section and compliments previous multivariate OLS regression with additional control variables. This regression can be observed in specification (1). Additionally, in this table, the BHAR was separated by deal characteristics in specifications (2), (3) and (4) to give additional insight into the effects of education on the announcement BHAR. Firstly, specification (2) is a subset of acquisition events that were paid by cash only. Secondly, specification (3) represents a subset of acquisition events that were cross-border deals. Finally, specification (4) describes a subset of acquisition events that were diversifying deals. Again, all regressions include fixed effects for year, industry and firm. Unfortunately, a few variables were omitted due to the lack of observations when separated into subsets.

Table 6: Multivariate OLS regressions with Announcement BHAR as the dependent variable and educational dimension measures as independent variables, by acquisition characteristics

VARIABLES	All	Cash Only	Cross-Border	Diversifying
	(1)	(2)	(3)	(4)
Cum Laude	0.028	Omitted		
	(0.020)			
Honours	-0.028	-0.038**	-0.027	-0.024*
	(0.026)	(0.016)	(0.078)	(0.011)
Ivy League	0.012	-0.008	0.068**	0.009
	(0.013)	(0.021)	(0.028)	(0.028)
Undergrad	-0.050***	Omitted		-0.100*
	(0.012)			(0.046)
Bachelor	0.012	0.015	-0.016	0.014
	(0.007)	(0.010)	(0.030)	(0.016)
Master or MBA	0.002	0.004	-0.010	0.012
	(0.006)	(0.014)	(0.026)	(0.013)
Doctorate	0.031**	0.038***	-0.001	0.010
	(0.013)	(0.010)	(0.012)	(0.017)
CEO Age	-0.003*	-0.002	-0.002	-0.006***
	(0.002)	(0.002)	(0.002)	(0.001)
CEO Tenure	0.005**	0.003	0.002	0.007***
	(0.001)	(0.002)	(0.001)	(0.002)
Female	0.036*	0.049***	0.079**	0.037**
	(0.019)	(0.013)	(0.027)	(0.014)
Cashflow	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Book Leverage	0.019	0.018*	0.018	0.004
	(0.016)	(0.009)	(0.034)	(0.012)
Market Leverage	-0.128**	-0.119**	-0.215**	-0.144*
	(0.045)	(0.046)	(0.085)	(0.072)
Constant	0.164	0.101	0.158	0.290***
	(0.089)	(0.102)	(0.143)	(0.053)
Observations	412	360	120	172
R-squared	0.356	0.300	0.606	0.444
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

With the added control variables, new observations can be made regarding a number of the independent variables of interest. Firstly, the independent variable Honours has a

negative sign across all specifications and is significant for specifications (2) and (3) at the 5 and 10 per cent levels, respectively. This is an interesting finding as it contradicts earlier findings of this paper in Tables 3-5. Secondly, the results show a significant and positive coefficient for the variable Ivy League in the cross-border sub-set. According to this result, in a cross-border acquisition, a CEO who went to an Ivy League university has on average a short-term BHAR of 6.8 per cent higher than his or her peers that did not go to an Ivy League university. This is an interesting find and one that does not necessarily have an answer in preceding literature. Nevertheless, it is still in line with the signalling theory that someone who went to an Ivy League university signals to the shareholders that they know what they are doing.

Furthermore, additional significant evidence can be observed for the variable Doctorate in specifications (1) and (2). Consistent with the previous models, in this model having a doctorate is significant at the 5 and 1 per cent levels for (1) and (2), respectively. Moreover, having a doctorate boosts the short-term BHAR by 3.1 and up to 3.8 per cent on average, which is quite substantial. Finally, Undergrad is significant at the 1 per cent and 10 per cent level for specifications (1) and (4), respectively. Consistent with the previous models, the sign appears to be negative in relation to BHAR ranging from -5 per cent in specification (1) up to -10 per cent in specification (4).

4.3 Long-term BHAR

In this final section of the results, the evidence of the effects of education on long-term BHAR will be discussed. The order of the tables will mirror those of the announcement BHAR, that were just discussed. In this section, the paper looks for evidence of performance excellence. Following the hypotheses of this paper, higher dimensions of knowledge and distinction should increase the long-term BHAR due to the ability of the CEO to better realise the performance and synergistic effects of the acquisition and contrarily dimensions of prestige should decrease the long-term BHAR due to the CEO overconfidence fallacy.

The single-variate OLS regressions of 1-year BHAR and 2-year BHAR can be found in Table 7 and Table C.4, respectively. Table 7, is consistent with this hypothesis in a couple of ways.

Table 7: Single-variate OLS regressions with 1-Year BHAR as the dependent variable and educational dimension measures as independent variables

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	0.321**						
	(0.107)						
Honours		0.154					
		(0.103)					
Undergrad			-0.376***				
			(0.091)				
Bachelor				0.030			
				(0.047)			
Master or MBA					-0.071		
					(0.097)		
Doctorate						0.104*	
						(0.048)	
Ivy League							0.020
							(0.079)
Constant	-0.009*	0.001	0.015***	-0.008	0.029	-0.011	0.002
	(0.005)	(0.003)	(0.002)	(0.019)	(0.033)	(0.007)	(0.009)
Observations	401	401	401	401	401	401	401
Number of industry	0.338	0.336	0.338	0.335	0.338	0.340	0.334
Year FE	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Firstly, Undergrad is significant at the 1 per cent level and substantially negative, CEOs with an undergraduate degree have 37.6 per cent lower long-term BHAR on average, in the data sample. In Table C.4 the sign is also negative for Undergrad, however, not significant anymore. Furthermore, Cum Laude is significant at the 5 per cent level and CEOs that graduated with cum laude have on average a 32.1 per cent higher long-term BHAR. However, this finding is not consistent with Table C.4, where neither the sign nor significance is the same for the same independent variable in the 2-year BHAR model.

Notably, Honours is significant at the 5 per cent level for the 2-year BHAR. This is consistent with the single-variate regressions of the announcement BHAR, but not consistent with the findings of Table 3. Doctorate is significant for both the 1 and 2-year BHAR at the 10 and 1 per cent levels, respectively. This is consistent with the idea that a CEO with a higher dimension of knowledge is better capable of creating long-term value after an acquisition. In the model of this paper, this ranges between 10.4 percent and

16.5 percent on average.

Finally, in Table C.4 an observation can be made regarding Ivy League that is in line with the theory of CEO overconfidence. Although weakly significant at the 10 per cent level, this single-variate model suggests that a CEO that went to an Ivy League university sees -26.6 per cent lower long-term BHAR after an acquisition. This could be evidence of the infamous empire-building fallacy that many CEOs fall for (Malmendier & Tate, 2005).

Table 8: Multivariate OLS regressions with 1-Year BHAR as the dependent variable and educational dimension measures as independent variables

VARIABLES	(1)	(2)	(3)
Undergrad		-0.395***	-0.480**
		(0.080)	(0.150)
Bachelor		0.090	0.068
		(0.060)	(0.075)
Master or MBA		-0.001	-0.016
		(0.110)	(0.123)
Doctorate		0.160**	0.152*
		(0.059)	(0.067)
Cum Laude	0.326**		0.316**
	(0.113)		(0.127)
Honours	0.158		0.075
	(0.109)		(0.115)
Ivy League	0.014		-0.082
	(0.082)		(0.102)
Constant	-0.015*	-0.045	-0.033
	(0.007)	(0.063)	(0.081)
Observations	401	401	401
R-squared	0.340	0.350	0.356
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Moving on to Table 8 and Table D.1, similar results as in Table 7 can be observed. Undergrad is both negative and significant at 5 and 10 per cent for specifications (2) and (3), respectively. This is consistent with what could be observed in the single-variate regression. Moreover, the variables Doctorate and Cum Laude are also significant in this model. Doctorate is significant at 5 and 10 per cent for specifications (2) and (3),

respectively. Having a doctorate increases the 1-year BHAR by 15.2-16.0 per cent, whereas a graduating cum laude increases the 1-year BHAR by 31.6-32.6 per cent on average. The variable Cum Laude is significant at the 5 per cent level.

Interesting is that these variables are no longer significant when looking at the results in Table D.1. None of the variables of interest is significant in both the 1-year BHAR and the 2-year BHAR. This could have interesting implications. For example, perhaps the first year post-acquisition is different compared to the second year post-acquisition. In Table D.1 observations consistent with the long-term BHAR hypotheses can be observed. First of all, Ivy League is negative and significant at the 10 and 5 per cent levels, respectively for specifications (1) and (3). This is consistent with the theory of value-destroying empire building. Having attended Ivy League reduces the 2-year BHAR by -27.3 - -45.6 per cent on average in this data sample. Contrarily, Honours is positive and significant at the 5 per cent level but only for the smaller specification. In this model, the only significant variable for the complete model - specification (3) - is Ivy League.

Table 9 and Table D.3 are the final tables of this section. Similar to Table 6, the long-term BHAR was once again separated by deal characteristics in specifications (2), (3) and (4) to give additional insight into the effects of education on the long-term BHAR. Moreover, the same control variables as in previous models were also added to this multi-variate regression. In these models, only a few significant results are observed. Firstly, Honours is consistent and has a positive sign in this all-inclusive model for the 1-year BHAR. CEOs that graduated with honours or distinction have on average a 68.8 per cent higher 1-year BHAR than CEOs that did not graduate with honours or distinction. This is consistent with the assumptions about the long-term value-creating of CEOs that graduated with distinction or honours. Although only weakly significant at the 10 per cent level, this value-creating characteristic of a CEO increases the BHAR up to 90.8 per cent on average in diversifying deals.

Moreover, in cross-border deals - specification (3) - it can be observed that Ivy League, Master or MBA and Bachelor are significant at the 10, 5 and 1 per cent, respectively. Surprisingly, this research finds that a bachelor's, master or MBA does not improve firm value in the long-term after acquisition but rather decreases this by -191.0 - -193.8 per cent on average. However, the observations of this sub-sample were rather low, so any real statistical inference of this subset should be made with utmost caution.

Table 9: Multivariate OLS regressions with 1-Year BHAR as the dependent variable and educational dimension measures as independent variables, by acquisition characteristics

VARIABLES	All	Cash Only	Cross-Border	Diversifying
	(1)	(2)	(3)	(4)
Cum Laude	0.068	Omitted		
	(0.233)			
Honours	0.688***	0.797	1.539	0.908*
	(0.165)	(0.484)	(1.263)	(0.422)
Ivy League	-0.300	-0.584	-4.055*	0.218
	(0.405)	(0.442)	(1.791)	(0.233)
Undergrad	-0.387	Omitted		
	(0.799)			
Bachelor	-0.102	-0.202	-1.910***	0.071
	(0.113)	(0.326)	(0.520)	(0.369)
Master or MBA	-0.142	-0.154	-1.938**	-0.110
	(0.201)	(0.237)	(0.772)	(0.308)
Doctorate	0.018	0.107	-0.036	-0.161
	(0.129)	(0.156)	(0.354)	(0.290)
CEO Age	0.025	0.023	0.198	0.003
	(0.017)	(0.018)	(0.110)	(0.029)
CEO Tenure	-0.033	-0.039	-0.196*	-0.003
	(0.033)	(0.042)	(0.089)	(0.033)
Female	0.102	0.184	0.730	0.306
	(0.194)	(0.212)	(0.451)	(0.278)
Cashflow	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Book Leverage	0.520*	0.514*	1.778**	0.501
	(0.271)	(0.273)	(0.612)	(0.309)
Market Leverage	0.217	0.274	0.180	-0.431
	(0.411)	(0.365)	(2.126)	(0.836)
Constant	-1.108	-0.869	-7.828	-0.249
	(0.746)	(0.677)	(5.146)	(1.429)
Observations	374	330	109	147
R-squared	0.469	0.479	0.707	0.523
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5 Conclusion and Discussion

This paper analysed a sample of 257 S&P500 constituents between 2010 and 2019. More specifically, this paper looked at executives that acted as the CEO of a S&P500 company during the period between 2000 and 2019. Foremost, the purpose of this paper was to explore the concept of CEO education in relation to firm performance and firm value. There is not a lot of literature out there on this topic specifically, however, a lot of parallels were drawn with other seminal papers on CEO characteristics (Zhang & Wiersema, 2009), (Hambrick & Mason, 1984) to lay a foundation for this exploratory research. The research design of this paper attempted to take into account the econometric complexity and obstacles of this particular data set. Furthermore, different specifications and models were used to answer several different hypotheses.

The R-squared was fairly high for many of the models, which is not surprising considering the independent variables are closely correlated (Lavery et al., 2019). However, this means that one must tread with caution when making any definitive statistical inferences on this subject matter.

First of all, this paper was not able to find convincing evidence for hypothesis 1 on firm performance. Rather, this paper finds that the dimensions of knowledge and the dimensions of prestige are significantly negative for the firm performance measures Tobin's Q and ROA. This completely contradicts the assumption that higher dimensions of education increase firm performance. The findings of this paper were not in line with papers by Adams et al. (2005) and Bennedsen et al. (2006), however, Malmendier and Tate (2009) wrote how sometimes CEO excellency can hurt shareholder value. It is also possible that due to the data selection these results were observed. Nevertheless, at this time, the paper has to reject hypothesis 1. In the second part of the empirical section, this paper looked at the short-term BHAR. Following the signalling theories by the likes of Certo et al. (2001), Certo (2003), and Higgins and Gulati (2003), this paper expected to see benefits for CEOs with higher dimensions of education. In the simple and multi-variate regressions, this paper found evidence supporting these claims. In the simpler models without control variables, CEOs that graduated cum laude saw significant increases in short-term BHAR, contrarily cum laude was not found to be significant in the model that included controls. On the other hand, the variable Honours was inconsistent across the models in both sign and significance. In light of these findings, this paper can reject hypothesis 4 at the time.

Moreover, this paper finds that undergraduates, bachelors and doctors also affect the short-term BHAR. With undergraduates negatively and bachelor's degrees and doctorates positively affecting short-term BHAR. Having a master's or MBA did not appear to affect the announcement BHAR in this data set. Considering these findings, this paper cannot

reject hypothesis 5 at this time. Finally, a CEO that went to an Ivy League university only affects short-term BHAR in cross-border deals but the significance and sign are consistent throughout the various models. In light of these findings, although scarce, this paper cannot reject hypothesis 6 at the time, but it does warrant more research to be able to say anything definitive on this.

For the final part of the empirical section, this paper looked at the long-term BHAR. Following the theories of seminal papers by Hambrick and Mason (1984), Petrick and Scherer (2003), Miller et al. (2015) and Certo et al. (2003), the assumption was made that higher dimensions of knowledge and distinction would increase long-term BHAR due to value enhancing qualities that benefit in the realizing of synergies and the acquisition potential.

This paper found in the models without control variables that, for the 1-year model a CEO that graduated cum laude, with honours or with a doctorate significantly increased the BHAR. Also, similar to these findings on the announcement BHAR, having an undergraduate degree significantly reduces this 1-year BHAR. Furthermore, having a bachelor's, master or MBA degree reduces long-term BHAR for cross-border deals. The 2-year model does not contradict the findings in the one-year model and has the same signs for the significant coefficients.

Concluding these findings, this paper has to reject hypothesis 2 at the time. This is due to Master or MBA being significant and negative, which contradicts the significant and positive sign of Doctorate. Hypothesis 3 cannot be rejected at this time as the signs and significance are consistent throughout the various models.

Finally in line with theories on CEO overconfidence (Hagendorff et al., 2021), a CEO that attended an Ivy League university sees a significantly lower long-term abnormal return. Therefore, hypothesis 7 cannot be rejected at this time.

In conclusion, the results were ambiguous at best due to some econometric and data fallacies in this research. There were some consistent findings. Graduating cum laude and having a doctorate is a good predictor for higher-than-average abnormal returns from acquisitions, whereas having an undergraduate degree is a good predictor for having lower-than-average abnormal returns. This paper did complete its purpose as an exploratory paper, it could be interesting to conduct more tests on this subject.

6 Limitations

The results of this paper should be interpreted with caution, due to a couple of limitations of this research. First of all, this paper was unable to find a proper instrumental variable and was also unable to replicate the one from Gounopoulos et al. (2020). Lacking an

instrumental variable sorely affects the ability to interpret results. Unfortunately, this research was not able to recreate the instrumental variable from Gounopoulos et al. (2020) due to time constraints and lack of data.

Secondly, this paper made a lot of assumptions in the hypotheses because this subject - M&A abnormal returns in combination with CEO education - is not incredibly well investigated yet. Therefore, assumptions about parallels between different well-tested CEO characteristics had to be drawn. This made the different hypotheses a little ambiguous. A suggestion for further research would be to test the independent variables of interest more rigorously and independently.

Moreover, as mentioned in the paper the R-squared of some of the models is incredibly high, especially the models without control variables. This is possibly attributable to multicollinearity between the independent variables and the lack of additional variables. This could pose serious issues when making statistical inferences of the variables and should be rectified in future research.

Finally, there were issues with the data sample. Due to the CEO's education data and the CEO's fundamental data not sharing a common identifier, the merging was done based on names. Because of this, names that had duplicate observations were removed from the data sample, which was quite a substantial amount. This greatly lowered the number of observations the BHAR regressions had. In future research this would have to be done manually. For this paper, this was impractical due to time constraints.

Appendices

A Summary Statistics

Table A.1: Summary statistics of the variables before merging the education data from BoardEx with the fundamental data set from Compustat - Capital IQ

VARIABLE	Obs.	Mean	S.D.	Min	Max
Salary	2180	$ 1,184.62	$ 396.90	$ 0.00	$ 2,800.76
Total Compensation	2180	$ 12,455.51	$ 6,941.49	$ 1,681.84	$ 43,490.57
Total Assets	2180	$ 40,744.57	$ 56,017.76	$ 2,352.68	$ 323,888.00
Capital Expenditure	2180	$ 1,783.25	$ 3,210.27	$ 0.00	$ 19,635.00
Net Income	2180	$ 2,504.92	$ 4,157.49	$ (4,068.00)	$ 23,040.00
PPE Net	2180	$ 12,628.73	$ 23,461.87	$ 0.00	$ 150,629.00
R&D Expenditure	2180	$ 812.87	$ 2,154.53	$ 0.00	$ 14,236.00
Cashflow	2180	$ 4,062.96	$ 6,361.48	$ (3,340.00)	$ 41,088.00
Market Equity	2180	$ 55,973.40	$ 98,176.416	$ 0.00	$ 2,064,811.00
Interest-bearing debt	2180	$ 12,526.861	$ 17,641.91	$ 0.00	$ 117,978.00
Operating Assets	2180	$ 26,684.43	$ 35,857.00	$ 302.03	$ 257,045.00
Market Value Assets	2180	$ 79,824.52	$ 122,473.40	$ 4,189.72	$ 2,256,405.00
CEO Age	2180	57.29	6.15	35.00	82.00
CEO Tenure	2163	9.68	6.76	0.06	57.37
Female	2180	0.05	0.21	0.00	1.00
TobinQ	2180	2.29	1.45	0.60	17.07
ROA	2016	0.09	0.07	-0.22	1.51
ROE	2016	0.25	11.04	-371.33	315.60
Book Leverage	2180	0.49	0.31	0.00	5.93
Market Leverage	2180	0.21	0.14	0.00	0.73
Unique firms	219				

Table A.2: Summary statistics of announcement BHAR dataset

	Obs.	Mean	S.D.	Min	Max
BHAR	429	0.00	0.05	-0.19	0.20
Cum Laude	429	0.04	0.20	0.00	1.00
Honours	429	0.03	0.17	0.00	1.00
Ivy League	429	0.11	0.32	0.00	1.00
Undergrad	429	0.03	0.17	0.00	1.00
Bachelor	429	0.40	0.49	0.00	1.00
Master or MBA	429	0.33	0.47	0.00	1.00
Doctorate	429	0.16	0.37	0.00	1.00
Dealsize	429	$ 2,353.68	$ 6,632.94	$ 5.00	$ 88,848.19
Cross-Border	429	0.32	0.47	0.00	1.00
Diversifying	429	0.47	0.50	0.00	1.00
Cash Only	429	0.88	0.32	0.00	1.00
Stock Only	429	0.03	0.16	0.00	1.00

Table A.3: Summary statistics of 1-year BHAR dataset

	Obs.	Mean	S.D.	Min	Max
BHAR	417	0.00	0.23	-0.75	1.04
Cum Laude	417	0.04	0.20	0.00	1.00
Honours	417	0.03	0.16	0.00	1.00
Ivy League	417	0.12	0.32	0.00	1.00
Undergrad	417	0.03	0.17	0.00	1.00
Bachelor	417	0.41	0.49	0.00	1.00
Master or MBA	417	0.34	0.47	0.00	1.00
Doctorate	417	0.14	0.35	0.00	1.00
Dealsize	417	$ 2,260.43	$ 6,608.27	$ 5.00	$ 88,848.19
Cross-Border	417	0.33	0.47	0.00	1.00
Diversifying	417	0.46	0.50	0.00	1.00
Cash Only	417	0.88	0.32	0.00	1.00
Stock Only	417	0.03	0.16	0.00	1.00

Table A.4: Summary statistics of 2-year BHAR dataset

	Obs.	Mean	S.D.	Min	Max
BHAR	388	0.01	0.42	-1.05	3.70
Cum Laude	388	0.04	0.19	0.00	1.00
Honours	388	0.03	0.16	0.00	1.00
Ivy League	388	0.12	0.32	0.00	1.00
Undergrad	388	0.03	0.16	0.00	1.00
Bachelor	388	0.41	0.49	0.00	1.00
Master or MBA	388	0.34	0.48	0.00	1.00
Doctorate	388	0.14	0.35	0.00	1.00
Dealsize	388	$ 2,092.96	$ 6,584.35	$ 5.00	$ 88,848.19
Cross-Border	388	0.33	0.47	0.00	1.00
Diversifying	388	0.45	0.50	0.00	1.00
Cash Only	388	0.90	0.30	0.00	1.00
Stock Only	388	0.02	0.12	0.00	1.00

Table A.5: Description of CEO variables and sources

Variables	Description	Source
Salary	Regular salary of a CEO, excluding other types of compensation	Execucomp
Total Compensation	The total compensation of a CEO including salary, bonuses and stock options	Execucomp
CEO Age	The age of the CEO of a given year	Execucomp
CEO Tenure	The tenure of a unique CEO within the data set	Execucomp
Female	Dummy variable indicating whether the observation was female	Execucomp
Undergrad	Dummy variable that is given to CEOs with an associates-degree or college-degree	BoardEx
Bachelor	Dummy variable that is given to CEOs with a bachelor's degree	BoardEx
Master or MBA	Dummy variable given to CEO's who obtained a master's or MBA	BoardEx
Doctorate	Dummy variable that is awarded to CEO's that obtained a doctorate in any curriculum	BoardEx
Cum Laude	Dummy variable that indicates whether a CEO completed its degree with a cum laude	BoardEx
Honours	Dummy variable that indicates whether a CEO completed its obtained degree with honours or distinction	BoardEx
Ivy League	Dummy variable that indicates whether the degree was obtained at an Ivy League university	N/A

Table A.6: Description of fundamental data variables and sources

Variables	Description	Source
Total Assets	The total assets in a given year	Compustat - Capital IQ
Capital Expenditure	The total capital expenditure in a given year	Compustat - Capital IQ
Net Income	The net income in a given year	Compustat - Capital IQ
PPE Net	Property plant and equipment net in a given year	Compustat - Capital IQ
R&D Expenditure	The total expenditure on research and development in a given year	Compustat - Capital IQ
Cashflow	The income before extraordinary items plus the depreciation and amortization in a given year	Compustat - Capital IQ
Market Equity	The product of the common shares outstanding times the closing price at the end of the calendar year in a given year	Compustat - Capital IQ
Interest-bearing debt	The sum of the total long-term debt and the interest-bearing short-term debt	Compustat - Capital IQ
Operating Assets	The sum of the interest-bearing debt and the total stockholder equity	Compustat - Capital IQ
Market Value Assets	The total assets plus the market equity minus the book equity	Compustat - Capital IQ
Book Equity	The total assets plus deferred taxes plus the convertible debt minus total liabilities minus the preferred stock value in a given year	Compustat - Capital IQ
TobinQ	The market value assets divided by the total assets	Compustat - Capital IQ
ROA	The gross income divided by the average total assets at t-0 and t-1	Compustat - Capital IQ
ROE	The net income divided by the shareholder equity at t-0 and t-1	Compustat - Capital IQ
Book Leverage	The interest-bearing debt divided by the operating assets	Compustat - Capital IQ
Market Leverage	The interest-bearing debt divided by the market equity plus the interest-bearing debt	Compustat - Capital IQ

B Firm performance

Table B.1: Multivariate OLS regression with Tobin's Q as dependent variable and educational dimension measures as independent variables, by acquisition characteristics

VARIABLES	TobinQ	TobinQ	TobinQ
	(1)	(2)	(3)
Undergrad		-0.058	-0.144
		(0.351)	(0.375)
Bachelor		-0.324	-0.327
		(0.207)	(0.286)
Master or MBA		-0.233	-0.373
		(0.252)	(0.352)
Doctorate		0.225	0.437
		(0.213)	(0.261)
Cum Laude	-0.053		-0.334
	(0.181)		(0.268)
Honours	0.060		0.043
	(0.151)		(0.257)
Ivy League	-0.905**		-1.195**
	(0.385)		(0.413)
CEO Age	0.021	0.005	0.019
	(0.015)	(0.009)	(0.013)
CEO Tenure	-0.014	-0.002	-0.018*
	(0.009)	(0.010)	(0.009)
Female	0.147	-0.045	0.193
	(0.276)	(0.201)	(0.220)
Cashflow	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Book Leverage	1.690***	1.830***	1.607***
	(0.379)	(0.298)	(0.396)
Market Leverage	-4.819***	-5.316***	-4.989***
	(0.875)	(0.911)	(0.697)
Constant	1.439*	2.306***	1.920**
	(0.685)	(0.557)	(0.772)
Observations	996	996	996
R-squared	0.862	0.860	0.869
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.2: Multivariate OLS regression with ROA as dependent variable and educational dimension measures as independent variables, by acquisition characteristics

VARIABLES	ROA	ROA	ROA
	(1)	(2)	(3)
Undergrad		-0.054***	-0.056***
		(0.009)	(0.010)
Bachelor		-0.024***	-0.026**
		(0.006)	(0.009)
Master or MBA		-0.027*	-0.029**
		(0.012)	(0.012)
Doctorate		-0.007	-0.009
		(0.008)	(0.009)
Cum Laude	0.010		0.002
	(0.019)		(0.021)
Honours	-0.012		0.004
	(0.021)		(0.017)
Ivy League	0.008		0.002
	(0.014)		(0.011)
CEO Age	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)
CEO Tenure	-0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Female	0.012	0.003	0.002
	(0.008)	(0.008)	(0.006)
Cashflow	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Book Leverage	-0.019*	-0.024***	-0.024***
	(0.009)	(0.006)	(0.007)
Market Leverage	-0.213***	-0.214***	-0.215***
	(0.035)	(0.033)	(0.032)
Constant	0.127***	0.159***	0.161***
	(0.027)	(0.030)	(0.028)
Observations	912	912	912
R-squared	0.521	0.523	0.523
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B.3: Multivariate OLS regression with ROE as dependent variable and educational dimension measures as independent variables, by acquisition characteristics

VARIABLES	ROE	ROE	ROE
	(1)	(2)	(3)
Undergrad		-0.550	-0.995
		(0.517)	(0.898)
Bachelor		-0.481	-0.891
		(0.539)	(0.897)
Master or MBA		-0.556	-1.166
		(0.667)	(1.055)
Doctorate		-0.869	-1.217
		(0.545)	(0.879)
Cum Laude	-1.644		-1.690
	(1.530)		(1.309)
Honours	0.358		1.142
	(0.750)		(1.462)
Ivy League	0.038		0.061
	(0.247)		(0.428)
CEO Age	-0.007	-0.017	-0.006
	(0.027)	(0.022)	(0.027)
CEO Tenure	0.018	0.023	0.014
	(0.013)	(0.014)	(0.013)
Female	0.045	0.131	0.141
	(0.308)	(0.299)	(0.336)
Cashflow	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Book Leverage	-0.845	-0.907	-0.925
	(2.298)	(2.364)	(2.393)
Market Leverage	0.290	-0.005	0.360
	(2.510)	(2.711)	(2.577)
Constant	0.096	1.164	1.068
	(1.630)	(1.187)	(1.228)
Observations	912	912	912
R-squared	0.108	0.108	0.109
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

C   Single-variate OLS regressions

Table C.1: Single-variate OLS regressions with Announcement BHAR as dependent variable and educational dimension measures as independent variables, no fixed effects robustness

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	0.015						
	(0.014)						
Honours		0.013					
		(0.009)					
Undergrad			-0.019*				
			(0.011)				
Bachelor				-0.007			
				(0.005)			
Master or MBA					0.006		
					(0.008)		
Doctorate						0.004	
						(0.004)	
Ivy League							0.010**
							(0.004)
Constant	-0.000	0.000	0.001	0.004*	-0.001	-0.000	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)
Observations	429	429	429	429	429	429	429
Number of industry	9	9	9	9	9	9	9
Robust SE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.2: Single-variate OLS regressions with 1-year BHAR as dependent variable and educational dimension measures as independent variables, no fixed effects robustness

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	0.011						
	(0.046)						
Honours		0.063*					
		(0.036)					
Undergrad			0.082				
			(0.111)				
Bachelor				0.020			
				(0.028)			
Master or MBA					-0.018		
					(0.024)		
Doctorate						0.027	
						(0.018)	
Ivy League							-0.039**
							(0.017)
Constant	-0.001	-0.003	-0.005	-0.010	0.007	-0.004	0.007
	(0.014)	(0.013)	(0.017)	(0.015)	(0.016)	(0.014)	(0.011)
Observations	417	417	417	417	417	417	417
Number of industry	9	9	9	9	9	9	9
Robust SE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table C.3: Single-variate OLS regressions with 2-year BHAR as dependent variable and educational dimension measures as independent variables, no fixed effects robustness

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	0.113***						
	(0.028)						
Honours		0.123					
		(0.149)					
Undergrad			-0.028				
			(0.137)				
Bachelor				0.033			
				(0.078)			
Master or MBA					0.006		
					(0.072)		
Doctorate						0.040	
						(0.048)	
Ivy League							-0.009
							(0.065)
Constant	-0.020	-0.019	-0.014	-0.030	-0.013	-0.020	-0.004
	(0.042)	(0.042)	(0.047)	(0.054)	(0.045)	(0.042)	(0.042)
Observations	388	388	388	388	388	388	388
Number of industry	9	9	9	9	9	9	9
Robust SE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table C.4: Single-variate OLS regressions with 2-year BHAR as dependent variable and educational dimension measures as independent variables, no fixed effects robustness, with fixed effect robustness

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Cum Laude	-0.179						
	(0.209)						
Honours		0.444**					
		(0.156)					
Undergrad			-0.280				
			(0.175)				
Bachelor				-0.034			
				(0.126)			
Master or MBA					-0.069		
					(0.186)		
Doctorate						0.165***	
						(0.048)	
Ivy League							-0.266*
							(0.139)
Constant	0.021**	0.002	0.020***	0.028	0.037	-0.011	0.044**
	(0.008)	(0.004)	(0.004)	(0.052)	(0.063)	(0.007)	(0.016)
Observations	374	374	374	374	374	374	374
Number of industry	0.412	0.418	0.413	0.412	0.413	0.417	0.417
Year FE	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

D Multivariate OLS regressions

Table D.1: Multivariate OLS regressions with 2-Year BHAR as dependent variable and educational dimension measures as independent variables, with fixed effect robustness

VARIABLES	(1)	(2)	(3)
Undergrad		-0.320	-0.799
		(0.316)	(0.443)
Bachelor		0.027	-0.069
		(0.153)	(0.201)
Master or MBA		-0.026	-0.085
		(0.288)	(0.315)
Doctorate		0.175	0.155
		(0.197)	(0.217)
Cum Laude	-0.149		-0.140
	(0.218)		(0.244)
Honours	0.453**		0.331
	(0.165)		(0.209)
Ivy League	-0.273*		-0.456**
	(0.138)		(0.180)
Constant	0.039**	-0.007	0.117
	(0.013)	(0.190)	(0.231)
Observations	374	374	374
R-squared	0.423	0.418	0.433
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table D.2: Multivariate OLS regressions with different BHAR models as dependent variable and educational dimension measures as independent variables, with fixed effect robustness

VARIABLES	Anouncement BHAR	1-year BHAR	2-year BHAR
	(1)	(2)	(3)
Undergrad	-0.020*	-0.480**	-0.799
	(0.009)	(0.150)	(0.443)
Bachelor	0.019**	0.068	-0.069
	(0.006)	(0.075)	(0.201)
Master or MBA	0.008	-0.016	-0.085
	(0.005)	(0.123)	(0.315)
Doctorate	0.028*	0.152*	0.155
	(0.013)	(0.067)	(0.217)
Cum Laude	0.077***	0.316**	-0.140
	(0.007)	(0.127)	(0.244)
Honours	0.008	0.075	0.331
	(0.017)	(0.115)	(0.209)
Ivy League	0.004	-0.082	-0.456**
	(0.019)	(0.102)	(0.180)
Constant	-0.018***	-0.033	0.117
	(0.004)	(0.081)	(0.231)
Observations	412	401	374
R-squared	0.307	0.356	0.433
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table D.3: Multivariate OLS regressions with 2-Year BHAR as dependent variable and educational dimension measures as independent variables, by acquisition characteristics with control variables and fixed effect

VARIABLES	All	Cash Only	Cross-Border	Diversifying
	(1)	(2)	(3)	(4)
Cum Laude	0.371*	Omitted		
	(0.179)			
Honours	0.287	0.273	0.541	0.344***
	(0.174)	(0.282)	(0.516)	(0.094)
Ivy League	0.028	-0.075	-1.047***	0.290**
	(0.181)	(0.227)	(0.281)	(0.091)
Undergrad	-0.381	Omitted		-0.038
	(0.239)			(0.244)
Bachelor	0.068	0.090	-0.544**	0.257***
	(0.043)	(0.144)	(0.168)	(0.064)
Master or MBA	-0.042	0.015	-0.633***	0.146**
	(0.076)	(0.133)	(0.103)	(0.059)
Doctorate	0.086	0.152*	0.053	0.132*
	(0.063)	(0.066)	(0.078)	(0.069)
CEO Age	0.010*	0.016**	0.070**	0.005
	(0.005)	(0.006)	(0.026)	(0.009)
CEO Tenure	-0.009	-0.021	-0.082***	-0.019
	(0.006)	(0.014)	(0.019)	(0.012)
Female	0.121	0.186*	0.349	0.139
	(0.072)	(0.096)	(0.187)	(0.104)
Cashflow	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Book Leverage	0.316***	0.362***	0.786***	0.313***
	(0.033)	(0.053)	(0.202)	(0.044)
Market Leverage	-0.915**	-0.952**	-1.194	-1.413***
	(0.294)	(0.302)	(0.670)	(0.193)
Constant	-0.467	-0.688***	-2.672	-0.172
	(0.283)	(0.188)	(1.552)	(0.382)
Observations	401	351	116	164
R-squared	0.391	0.403	0.618	0.569
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

E Control variables

Table E.1: Multivariate OLS regressions with Announcement BHAR and 1 and 2-year BHAR as dependent variables and controls variables as independent variables, with fixed effect robustness

VARIABLES	Announcement BHAR	1-year BHAR	2-year BHAR
	(1)	(2)	(3)
CEO age	-0.003	0.004	0.008
	(0.002)	(0.004)	(0.020)
CEO tenure	0.004**	-0.007	-0.026
	(0.002)	(0.007)	(0.031)
Female	0.043***	0.099	-0.078
	(0.006)	(0.058)	(0.252)
Cash Flow	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Book Leverage	0.020	0.278***	0.508*
	(0.014)	(0.041)	(0.228)
Market Leverage	-0.132**	-0.880***	0.253
	(0.045)	(0.259)	(0.425)
Constant	0.154	-0.054	-0.352
	(0.084)	(0.231)	(0.890)
Observations	412	401	374
R-squared	0.341	0.367	0.454
Year FE	YES	YES	YES
Industry FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table E.2: Correlation matrix with Announcement BHAR and several control variables

	BHAR	CEO Age	CEO Tenure	Female	Cash Flow	Book Leverage	Market Leverage
BHAR	1.00						
CEO Age	-0.04	1.00					
CEO Tenure	-0.03	0.08	1.00				
Female	-0.01	0.05	-0.13	1.00			
Cash Flow	-0.02	0.18	0.00	-0.04	1.00		
Book Leverage	0.05	0.06	-0.23	0.19	-0.06	1.00	
Market Leverage	0.01	0.14	-0.12	0.12	0.00	0.52	1.00

Table E.3: Correlation matrix with 1-year BHAR and several control variables

	BHAR	CEO Age	CEO Tenure	Female	Cash Flow	Book Leverage	Market Leverage
BHAR	1.00						
CEO Age	-0.10	1.00					
CEO Tenure	-0.02	0.08	1.00				
Female	-0.05	0.04	-0.14	1.00			
Cash Flow	-0.17	0.18	0.01	-0.04	1.00		
Book Leverage	-0.02	0.06	-0.25	0.19	-0.06	1.00	
Market Leverage	-0.09	0.14	-0.14	0.12	0.01	0.52	1.00

Table E.4: Correlation matrix with 2-year BHAR and several control variables

	BHAR	CEO Age	CEO Tenure	Female	Cash Flow	Book Leverage	Market Leverage
BHAR	1.00						
CEO Age	-0.17	1.00					
CEO Tenure	-0.01	0.08	1.00				
Female	-0.07	0.05	-0.16	1.00			
Cash Flow	-0.20	0.19	0.02	-0.04	1.00		
Book Leverage	-0.04	0.07	-0.27	0.21	-0.06	1.00	
Market Leverage	-0.08	0.14	-0.15	0.12	0.01	0.55	1.00

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