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CEO Education-Performance Relationship: Evidence from Saudi Arabia

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Abstract

The study investigates the association between CEO education and firm performance with a sample of 85 nonfinancial firms listed on the Saudi stock exchange during 2018 applying ordinary least squares method. CEO education is defined by three variables, the level of education, if the degree-granting institution is domestic or foreign, and if the highest degree is in management or other fields of study. Financial performance is measured by return on assets and return on equity. Firm size, age, liquidity and growth are introduced as control variables. The study shows that 58 CEOs of the firms studied are graduates, 38 have obtained their degree from a domestic institution and 44 have a management degree. Graduate CEOs are found to enhance performance. Graduating from a domestic institution influences performance positively. Management degree of CEO does not seem to impact performance. Firm size, liquidity and growth are positively associated with performance. Firm age does not explain performance differences of firms. Results are robust to performance measures. The findings of the study suggest that firms can benefit from a CEO hiring policy that emphasizes on the minimum qualification set as graduation or higher, education from a domestic institution and no undue weight on management qualification.

Keywords: CEO Education, Firm Performance, Management Degree, Business Leadership, Saudi Arabia

JEL Classification Code: I21, L25, M12, M51, N15

1. Introduction

The empirical literature has well established that CEO (Chief Executive Officer) characteristics can explain the differences in firm performance (Adams, Almeida & Ferreira, 2005; Graham, Harvey & Puri, 2013; Kaplan, Klebanov & Sorensen, 2012; King, Srivastav & Williams, 2016; Malmendier, Tate and Yan, 2011). In search of answer to the question, "What characteristics of CEO can enhance firm performance?", several CEO characteristics like narcissism, leadership, team-building ability, overconfidence, integrity, efficiency, gaining stakeholders' trust, efficiency, etc., are listed (Bertrand & Scholar, 2003; Bhagat, Bolton & Subramanian, 2010; Colbert, Barrick & Bradley, 2014; Hiller & Hambrick, 2005). The major challenge that empirical works face is to define a quantifiable measure that represents these attributes (Falato, Li & Milbourn, 2015). Since education weighs heavily on the CEO recruitment and compensation, it is proposed as the objective measure of CEO's ability to impact firm performance (Bhagat et al., 2010; Graham, Li & Qiu, 2012). This choice is justified by empirical works that proxy CEO education for technical and managerial competency (Bowers & Seashore, 1966), ability to handle complex information and take fast decisions (Hunter, 1986), receptivity to new ideas (Thomas, Litschert & Ramaswamy, 1991), entrepreneurial drive (Robinson & Sexton, 1994), cognitive ability (Wally & Baum, 1994), prestige (Certo, 2003), ability to cope with uncertain scenarios (Gottfredson, 2003), openness to innovation and adaptability to change (Ng & Feldman, 2009), thinking process (Gottesman & Morey, 2010), ability to devise effective strategies (Xiaowei & Zhang, 2010), and managerial effectiveness (Saidu, 2019). However, the literature on CEO education-performance link is still evolving.

Empirical works on CEO education-performance have come up with mixed results. Some works show a positive

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association (Elsharkawy, Paterson, & Sherif, 2018; King et al., 2016), while others show no significant relation between the two variables (Gottesman & Morey, 2010; Jalbert, Furumo & Jalbert, 2011). More research is needed to bring consensus on CEO education-performance link. This research contributes to the literature in at least two significant ways. One, the study attempts to provide a definitive answer to the question whether CEO education influences firm performance. Second, most of the studies that investigate CEO education-performance connection are carried out in the US (Morresi, 2017). There is a need to carry out similar studies in other countries. This study produces evidence of this link in Saudi Arabia, a country where a similar study does not exist.

2. Literature Review and Hypothesis Development

Several theories offer the framework for understanding the CEO education-performance link. Human capital theory (Becker, 1964; Mincer, 1958) suggests that a firm can profit from the cognitive and productivity ability of an individual derived from the individual's stock of experience, education and skills. The theory argues that the marginal productivity of labor is determined by education that has the potential to influence the firm's earnings. The theory proposes a positive CEO education-performance link. Proponents of upper echelons theory (Hambrick & Mason, 1984) argue CEO characteristics like experience, values and personality hold the key to understanding the strategic choices of the firm and its performance. Empirical testing of the theory suggests that CEOs who are highly educated are more knowledgeable with better cognitive ability. This ability positively impacts their approach to decision making and identifying more appropriate strategic actions that can positively impact performance (Dragoni, Oh, Vankatwyk & Tesluk, 2011; Wang, Holmes Jr., Oh & Zhu, 2016). Upper echelons theory proposes a positive association with the level of CEO education and performance. Advocates of resource dependence theory (Barney, 1991) argue that a firm can gain competitive advantage to increase performance from intangible assets like human capital. To be effective as competitive advantage, the human capital should be valuable, scarce, unique with no substitutes. Barney and Arikan (2001) test the theory and conclude that firms with managers of high quality perform better than their counterparts with less quality managers. Theories suggest a positive CEO education-performance link. However, empirical works produce mixed results.

Bhagat et al. (2010) study 1,500 largest US firms in the Standard & Poor's super-composite 1500 over 1992 to 2007. The study employs 22 education-related measures broadly belonging to two categories, field of study and ranking of the school. Both short-term, return on assets, and long-term, stock return and Tobin's Q, measures of performance are employed. The study fails to produce evidence to support CEO education-performance link and concludes that education may not be a good proxy for CEO's ability.

Gottesman and Morey (2010) test the CEO education background and performance link on a sample of 390 US firms. Educational background is defined by the type of degree and the school selection of the CEO. Performance is measured by Tobin's Q. The study finds a significant link between both the type of degree and school selectivity with Tobin's Q. Results are explained by citing the length of time that lapses between the attainment of formal education and becoming CEO. This time gap renders formal education irrelevant.

Koyuncu, Firfiray, Claes and Hamori (2010) examine the importance of the functional specialization of the CEO in operations for performance with a sample of 437 CEOs from S&P during 1992 to 2005. CEOs with specialization in operations are found to perform better than with finance specialization. Study attributes the increased dependence on operations specialization to enhanced focus on cost effectiveness by firms.

Jalbert et al. (2011) examine the level of education and school ranking of CEOs of large US firms during the period, 1997-2006. Performance is assessed by return on assets, return on equity and return on investment. The study shows that, while being undergraduate is essential to become CEO, a graduate degree is not. Accomplishment of undergraduate degree does not explain differences in return on assets and return on investment, but is significantly and positively related to return on investment. School rank is found to be associated with return on equity. Graduate school ranking is marginally significantly cause variations in return on assets. While undergraduate school ranking affects return on investment positively, graduate school ranking affects the variable negatively.

King et al. (2016) show that both level of education and school quality influence bank performance. A sample of 149 large US banks are studied during 1992 to 2011. Results show CEOs with an MBA have the ability to deliver better performance than their counterparts. MBA from a better-ranked school is found to results in CEOs assuming more risk and adopt innovative models of business to achieve better performance. The study concludes that management degree enhances CEOs' ability to manage bigger and more complex banks and attain improved performance.

Cheng, Li and Chih (2020) evaluate if the managerial ability and firm strategy fit can influence the firm performance with a sample of 34285 firm-year observations from US listed firms during the period, 1992-2014. Along with other variables, they check if CEO with a management degree can impact performance. The results show a positive association with performance and a negative relationship with risk.

In Europe, Morresi (2017) examines CEO education-performance relation with a sample of 612 firms of market capitalization of over one billion euros listed on stock exchanges of UK, France, Italy, Spain, Germany and Netherlands during 2006 to 2015. The level of education, quality of school, and study specialization of CEO are evaluated against the accounting and market related performance. The study finds that CEOs with a higher degree and from a better-ranked school do not boost performance. But, CEOs from top ranked schools are found to enhance long-term market performance. The study infers the CEO education helps to reduce information asymmetry problem.

Ayaba (2012) analyzes the link between the level and field of education of 100 CEOs of firms listed on Stockholm stock exchange on return on assets between 2008 and 2010. Evidence produced by the study shows that both the level of education and the field of study have a limited ability to explain the performance differences. The study calls for a focus on the contemporary business challenges to be built into the curriculum offered by graduate schools.

Elsharkawy et al. (2018) investigate if the educational background of CEO of 54 UK listed banks on performance during 2005 to 2015. CEO education is defined if CEO has a business degree. Performance is measured by Tobin's Q, return on average assets, return on average equity and net interest margin. The study finds that business education has a significant positive link to Tobin's Q and net interest margin, but an insignificant positive relation to return on average assets and return on average equity.

CEO education-performance is also studied in a few developing countries as well. Darmadi (2013) studies 160 firms listed on the Indonesia stock exchange during 2007. Three measures of educational qualification of CEO and board members are correlated with two measures of firm performance. If a post graduate degree holder, if the degree is from a prestigious domestic university, if degree is from a developed country and if degree is in financial discipline are the education variables. Performance variables are return on assets and Tobin's Q. The study shows CEOs with degrees from domestic prestigious institution impact performance better than CEOs without similar qualification.

Lu and Zhang (2015) examine the CEO education-performance link with the data of Chinese publicly-listed firms from 2003 to 2012. After addressing the endogeneity in the CEO education variable with the instrumental variables of the college entry exam rate in China's different provinces in different years, the impacts of cultural revolution on CEO education, and the growth environment of the CEO, the authors find that excellent CEO education can significantly enhance firm value, but cannot significantly affect firms' accounting profitability and growth rate. These findings suggest that a CEO with high education background can enhance the expectation on the value of the firm from investors; however, CEO education may not help enhance performance in the short run.

Saidu (2019) investigates CEO education-performance association with a sample of 222 firm year observations relating to financial firms listed in Nigerian stock exchange over the period, 2011-2016. Results show CEO education is positively linked to all the three measures of performance employed by the study. While the association with return on assets is statistically significant, the association with the other two variables, stock price and return on equity are not statistically significant.

Research that tests the CEO education-performance comes up with mixed results. Broadly, the empirical works employ four broad measures of CEO education, level, ranking, domestic or foreign and field of study. This study employs three of these measures namely, level, domestic or foreign and field of study. School ranking is not included as all the domestic institutions in Saudi Arabia do not have ranking by a single agency. The study proposes the following hypotheses.

Hypothesis 1: *CEOs with a graduate degree perform better than CEOs with a lower qualification.*

De Kort and Vermeulen (2010) suggest that CEOs with higher educational qualification may tend to become overconfident. This overconfidence may render investment and managerial decisions ineffective, harming performance. King et al. (2016) contend that both the level and quality of CEO education matter to firm performance. It is hypothesized that most of the studies in the literature are from developed country, in a developing country like Saudi Arabia where most of the firms are family businesses with boards characterized by heavy family representation, CEO with higher level of degree may positively impact performance.

Hypothesis 2: *CEOs with highest educational qualification obtained from a domestic institution will perform better than CEOs with a foreign degree.*

Previous works suggest lack of knowledge about domestic market may constrain the decision-making power of executives. This may diminish performance. (Lord & Ranft, 2000) This is particularly true in case of emerging markets. (Harvey, Speier & Novicevic, 1999) Darmadi (2013) investigates the influence of education of the CEO and the members of the board of directors on firm performance with a sample of firms from Indonesia. The evidence shows that CEOs with degree from prestigious domestic institutions enhance performance more than their counterparts without similar qualification. Saudi Arabia is an Islamic country with businesses operating in the Sharia law framework. This calls for country specific knowledge. The

study hypothesizes a positive relationship between CEOs education from a domestic educational institution, which can have a greater emphasize on local market conditions and business environment and firm performance.

Hypothesis 3: *Performance of firms with CEOs with MBA degree may be higher than those without CEOs with MBA degree.*

The empirical literature on how effective the CEOs with an MBA degree in delivering higher performance are is mixed. Lindorff and Jonson (2013) examine the association between CEO management education on shareholder return and find no significant relationship. They conclude that management education may not offer relevant competencies at the CEO level. Degree in management enhances CEO's comprehension of sophisticated investment evaluation techniques is supporting by the findings of some empirical works (Graham & Harvey, 2002). This may enhance performance. As the boards continue to hire CEOs with managerial qualification and compensate them more this hypothesis is tested in the context of Saudi Arabia.

3. Data and Methodology

All non-financial firms listed on the Saudi stock market for which data is available for the study variables for 2018 in Standard & Poor's Capital IQ database are chosen for the study. A sample of 85 firms is chosen through this process. Data on CEO education is extracted from the annual reports of each of the company published in Saudi stock market website, www.tadawul.sa.

3.1. Variables Studied

This section describes the dependent and independent variables studied.

3.1.1. Performance Variables

Accounting measures of performance that utilize information from the financial statements are most popular in empirical works. Use of these measures is rationalized on several counts. First, data required for performance assessment can be easily ascertained from published financial statements (Richard, Devinney, Yip & Johnson, 2009. the performance of the firm to the external stakeholders through published financial statements and hence measures based on these statements is most appropriate. In line with these suggestions from the existing literature, the study employs two measures of performance based on financial statements, namely, return on assets and return on equity.

3.1.2. CEO Education Variables

As mentioned in the hypothesis development section, the study includes three variables relating to CEO education that measure level of education, location of educational institution and education background. The first variable relating to the level of CEO education measures if the CEO has a graduate degree or above. The second variable is defined by the location of the educational institution from which the CEO obtained the highest educational qualification. On the basis of the location the institutions are classified as domestic or foreign. The third variable is about the educational background, whether the CEO has a degree in management or other branches. CEOs with a higher level of education and degree from a domestic institution are expected to enhance firm performance. If CEOs with a management degree deliver higher performance than their counterparts with a degree from other domains of expertise is hypothesized as management degree is weighs heavily in CEO hiring and compensation decisions.

3.1.3. Control Variables

Variables that are normally considered by the current literature are studied. These variables measure firm size, firm age, liquidity of the firm and growth. Large firms generally are more diversified, enjoy higher efficiency in operations and suffer less from information asymmetry problem (Nguyen & Nguyen, 2020; Rajan & Zingales, 1995; Ramaswamy, 2001; Frank & Goyal, 2003). All these characteristics suggest enhanced performance with size. Stadler (2007) argues that firms acquire more knowledge with advancement in age. Coad, Segarra and Teruel (2013) show that productivity, profits, size and equity usage increases with age. This suggests a positive association between firm age and performance. Age may also diminish performance as matured firms may tend to resist change and are less flexible (Leonard-Barton, 1992). Liquidity may positively affect performance by meeting the firm's current obligations and facilitating its smooth function (Nguyen & Nguyen, 2020; Nguyen, Pham & Nguyen, 2020). Excessive liquidity may impair performance by managerial expropriation behavior of investing in negative net present value projects (Fama & Jensen, 1983; Adams & Buckle, 2003). Market to book ratio proxies a firm's potential to grow and is positively correlated to performance (Miller & Modigliani, 1961; Myers, 1977; Rajan & Zingales, 1995).

Table 1 below lists the variables included in the study and their definitions along with their expected relationship with firm performance.

Table 2 presents descriptive statistics in panel A and correlations in panel B. ROA ranges from 5.77 percent to

Table 1: Variables Definition

Variable	Definition	Abbreviation	Expected sign
Firm performance	Operating profit before depreciation / Total assets	ROA	Dependent variables
	Net profit / Shareholders' equity	ROE	
CEO education	Dummy variable equal to 1 if the CEO is a graduate and 0 otherwise	D1	+
	Dummy variable equal to 1 if the highest qualification of the CEO is from a domestic educational institution and 0 otherwise	D2	+
	Dummy variable equal to 1 if the highest educational qualification of the CEO is in management and 0 otherwise	D3	+/-
Size	Log (Total assets)	LTA	+
Age	Log (years since incorporation)	AGE	+/-
Liquidity	Current assets / Current liabilities	CRR	+
Growth	(Total assets – Book value of assets + Market value of assets) / Total assets	MTB	+

Table 2: Descriptive Statistics and Correlations

Panel A: Descriptive Statistics									
	ROA	**ROE**	**D1**	**D2**	**D3**	**LTA**	**AGE**	**CRR**	**MTB**
Minimum	-0.058	-0.188	0	0	0	2.001	0.699	0.054	0.291
I quartile	0.037	-0.008	0	0	0	2.906	1.301	1.011	0.966
Median	0.067	0.052	1	0	1	3.279	1.462	1.517	1.112
III quartile	0.116	0.151	1	1	1	3.594	1.613	2.765	1.701
Maximum	0.233	0.336	1	1	1	5.505	2.045	11.749	3.548
Number of observations	85	81	85	85	85	85	85	81	85
Panel B: Correlations									
ROA	1.000								
ROE	0.829	1.000							
D1	0.049	0.124	1.000						
D2	0.101	0.094	-0.330	1.000					
D3	0.013	0.059	0.332	-0.139	1.000				
LTA	0.513	0.595	-0.033	-0.142	0.161	1.000			
AGE	-0.053	-0.182	0.008	0.098	-0.238	-0.280	1.000		
CRR	0.015	-0.049	0.090	-0.197	0.002	-0.201	0.189	1.000	
MTB	0.281	0.120	-0.032	0.214	-0.034	-0.171	0.146	-0.081	1.000

23.31 percent with the median at 6.66 percent. Firms in the first quartile have a negative ROE. The median ROE is low at 5.18 per cent. Firms in the first quartile have a CEO who has an undergraduate degree from a foreign university, and educational qualification in a non-managerial discipline. Firms in the higher three quartiles have a CEO with a graduate degree or higher and with a management degree. Only CEOs of firms in higher two quartiles have their highest degree from a domestic university. Looking at the base numbers, as many as 58 CEOs studied have a qualification

of graduate degree or higher. This shows that many firms have highly educated CEOs. Only 38 CEOs have obtained their highest degrees from a domestic institution while a larger number of CEOs, 47 have graduated from a foreign university. CEOs with an MBA and with other degrees are almost equal at 44 and 41 respectively. Correlations between the study variables show that the multicollinearity may not be a problem before testing the models. The study applies ordinary least squares regression to test the following models.

$$ROA = f(D1, D2, D3, LTA, AGE, CRR, MTB)$$
$$ROE = f(D1, D2, D3, LTA, AGE, CRR, MTB)$$

4. Results

Regression results are reported in Table 3. Along with the OLS standard errors, as Brooks (2008) suggests the White heteroskedasticity-consistent standard errors is also reported to handle the problem of heteroskedasticity. The

Table 3: Regression results

Model 1							
Variable	**Coefficient**	**OLS -SE**	**t-statistic**	**Prob.**	**White-SE**	**t-statistic**	**Prob.**
Constant	-0.1502	0.0528	-2.8430***	0.0058	0.0486	-3.0895***	0.0028
D1	0.0287	0.0133	2.1584**	0.0342	0.0130	2.2088**	0.0303
D2	0.0293	0.0122	2.3943**	0.0192	0.0119	2.4661**	0.0160
D3	-0.0179	0.0120	-1.4893	0.1407	0.0122	-1.4674	0.1466
LTA	0.0577	0.0086	6.6873***	0.0000	0.0090	6.4466***	0.0000
AGE	-0.0204	0.0246	-0.8288	0.4099	0.0195	-1.0478	0.2982
CRR	0.0060	0.0029	2.1074**	0.0385	0.0019	3.1377***	0.0025
MTB	0.0389	0.0091	4.2985***	0.0001	0.0122	3.2025***	0.0020
Adjusted R-squared	0.4085						
F-statistic	8.8916***						
Prob(F-statistic)	0.0000						
Model 2							
Constant	**-0.3231**	**0.0978**	**-3.3034*** **	**0.0015**	**0.0730**	**-4.4283*** **	**0.0000**
D1	0.0667	0.0238	2.8022***	0.0066	0.0239	2.7924***	0.0068
D2	0.0610	0.0223	2.7384***	0.0078	0.0232	2.6314***	0.0105
D3	-0.0288	0.0218	-1.3204	0.1911	0.0203	-1.4219	0.1596
LTA	0.1180	0.0156	7.5729***	0.0000	0.0156	7.5842***	0.0000
AGE	-0.0510	0.0449	-1.1355	0.2601	0.0355	-1.4344	0.1560
CRR	0.0087	0.0051	1.7201*	0.0899	0.0034	2.5728***	0.0122
MTB	0.0405	0.0166	2.4453**	0.0170	0.0174	2.3335**	0.0225
Adjusted R-squared	0.4538						
F-statistic	10.0216***						
Prob(F-statistic)	0.0000						

Model 1 dependent variable: ROA; Model 2 dependent variable: ROE;
OLS-SE refers to OLS standard errors considering homoscedasticity
White-SE refers to White standard errors considering heteroscedasticity
*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level

results of the regressions run are consistent across both the measures of firm performance. We find CEOs with higher level of qualification and the highest degree from a domestic educational institution enhance firm performance, while performance of CEOs with a management degree is not found to be statistically significant. Larger firms, firms with higher liquidity and higher growth rate are found to be more profitable. Younger firms are found to perform better than older firms. Our results are in line with the proposed hypotheses.

Jarque-Bera (1980) test is for checking if the residuals are normal. We find the residuals of both the models are normally distributed. The models tested do not suffer from misspecification error and multicollinearity problem as evident from the Ramsey regression equation specification error test and variance inflation factor reported. All the results of the diagnostic tests show that the results of the models are dependable (see Table 4).

Our results that CEOs with a higher educational qualification and CEOs who graduate from a domestic institution perform better than their counterparts are in line with the results of some of the previous works (Darmadi, 2013; King et al., 2016). That a management degree may not help a CEO to deliver a higher performance is also supported by the findings of earlier studies (Lindorff & Jonson, 2013). Finkelstein, Hambrick and Cannella (2009) attribute to the fact that executives arrive at the top after many years of completion of formal education.

5. Discussion and Conclusion

Human capital theory relates CEO education to higher earnings thorough increased marginal productivity of labor. Upper echelons theory postulates that CEO education relates to firm performance as it can impact strategic choices. Resource dependence theory contemplates a positive link between CEO education and firm performance as CEOs with a higher qualification may prove to be a source of competitive advantage. Results of this study show a positive CEO education-performance link. The findings are consistent with the contentions of all these theories. It may be inferred that CEOs with a higher educational qualification have a better ability to handle complex business organizations, adopt effective profitable strategies and prove to be a valuable human resource to the firm as suggested by the theories.

Saudi Arabia is an Islamic country following sharia law and has a typical business environment of an oil-dependent economy. All these call for knowledge about the business, cultural, legal and economic conditions unique to the country. This may be the reason why CEOs with the highest degree from a domestic university deliver superior performance compared to CEOs with their qualification from a foreign university. Firms in Saudi Arabia have a critical role to play in fructifying the Vision 2030 of the country in diversifying the economy from oil by promoting investments in new sectors like mining, recreation and tourism. Such an emphasis that provides the direction for future economic growth may hold the key to explaining why CEOs with the higher educational degree and from a domestic institution perform better. Besides, this may also call for CEOs with technical and operational knowledge specific to these sectors may be the need of the hour rather than a management degree.

Our findings have important implications for firms in Saudi Arabia. Like all other GCC countries, Saudi Arabia is dominated by family firms. In the Gulf region, family firms play a prominent role in their economic contribution. They

Table 4: Results of Diagnostic Tests

	Model 1	**Model 2**
Jarque-Bera test for normality of residuals	0.6617 (0.7183)	0.2537 (0.8809)
Ramsey regression equation specification error test (RESET)	0.32 (0.8126)	0.53 (0.6661)
	Variance inflation factor	Variance inflation factor
D1	1.25	1.28
D2	1.22	1.26
D3	1.19	1.22
LTA	1.18	1.19
AGE	1.15	1.19
CRR	1.13	1.14
MTB	1.07	1.09

P value in parenthesis

contribute around 60 percent to GDP, hire around 80 percent of the labor force with an estimated stake of around one trillion USD to be passed to the generation next (PwC family business survey, 2019). A large number of these family businesses already have members of the family in the top management positions and preparing successors to take over the leadership of their businesses. KPMG's family business survey of 2017 shows that around 60 percent of the family businesses surveyed were led by family and 88 percent of the firms are preparing to find successors for leadership from the family (home.kpmg/sa.html). Our findings that firms with CEOs with a higher degree and from a domestic university perform better than their counterparts should be considered in the succession plans of the family firms.

Due to the tedious data collection process the current study is based on a single year, however, an analysis for a longer period may confirm the generalization of the results of this study. The study points out the need for further research on how CEO education impacts the performance of family versus non-family firms.

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